



MINISTERUL  
CERCETĂRII  
ȘI INOVĂRII



Proceedings of  
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# **E U R O I N V E N T**

## **EUROPEAN EXHIBITION OF CREATIVITY AND INNOVATION**



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All the patents and research information are provided  
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## Message of Mayor of Iasi

Your Excellencies,



On the occasion of the 10th European Exhibition of Creativity and Innovation, I am very happy to welcome you in Iasi, a modern and opened city for all cultures and people all over the world.

It is such a privilege to have such wonderful, talented and undeniable international inventors in the middle of the people in Iasi, a symbol of unity, peace and tolerance across borders.

Iasi will definitely become year after year a green, modern and dynamic city to work, live and invest energy for sustainable projects for the entire community.

I am very proud that inventors in Iasi are recognized all over the world, the awards in Bruxelles, Geneva, Bangkok, Warsaw, Helsinki etc. being just a proof that our invention and research school is at the top of international scientific standards.

Iasi City Hall offers you full support for your efforts towards progress and I am more than willing to work together with your prestigious community to identify the best resources in order to sustain your academic and scientific activity.

You are definitely excellent ambassadors of Romania all over the world and I hope that all of you will cherish Iasi and its memories close to your hearts forever.

I wish you full success for your exceptional event for our academic and research city profile and I am positively sure that a lot of good ideas will emerge from your diversity of thoughts and from our untapped creative power.

Once again welcome to Iasi and I wish you to have always inspiration of your side, to believe in your dreams and certainly one day they will come true!





romania2019.eu

## IN MEMORIAM



### Eng. Chem. Stefan MANEA

05.06.1937 – 14.05.2018

General Director & founder

**Hofigal Export-Import**

"Nature has solutions to everything,"

Over 130 inventions and more than 450 products created!

Eng chim. Stefan Manea is one of the greatest scientists of Romanian research in the field of medicinal and aromatic plants. Excellent professional, visionary with a creative talent out of the ordinary, Ștefan Manea gave a new value to the Romanian flora through a superior valorisation of its therapeutic qualities under advanced technological conditions, observing the most demanding conditions at European level of this industry. Researcher Ștefan Manea was deeply concerned about the health of the Romanians. One of the constants of his work being to contribute to educating Romanians for health and to promote prevention as a lifestyle.



## Gheorghe Asachi Technical University of Iasi

The *Gheorghe Asachi* Technical University of Iasi (TUIASI) has the oldest tradition in the engineering field of education in Romania. In 1813 the scholar Gheorghe Asachi established the first school for surveyors and civil engineers considered to be the nucleus of the technical higher education in Iasi. Currently, the *Gheorghe Asachi* Technical University of Iasi has 11 faculties and 4 departments that offer educational and doctoral programmes for more than 17000 students in 61 engineering specializations, 73 *Master of Science* programs and 10 doctoral schools.

Besides its educational mission, the *Gheorghe Asachi* Technical University of Iasi has an important research dimension, having 21 accredited centers and laboratories for scientific research. These centers activate in different fields, within national and international research grants, research contracts with industry or governmental organizations, their activities placing our university in the Romanian top of scientific research.

The constant focus on interdisciplinary research, on innovation and knowledge transfer, as well the quality of the research staff and their commitment for excellence provided a constant dynamics of research activities and the recognition and visibility of our university. The increased trend observed in the number of research contracts, published papers in peer reviewed international journals and conference proceedings, books, international co-operation grants, as well as joint Ph.D. supervision with well-known European universities contribute to the continuous appreciation of our university as a successful research and innovation institution able to provide proactive relationships with industry and public services and a contributor to local and regional development. Only in the last academic year, our university has participated in more than 350 national and international projects as well as research contracts.

Our research profile is directed towards high-tech engineering areas, which enable our research staff to have a very innovative approach towards research problems. Innovation in our university comes as sum of experience provided by our 172 of senior researchers, PhD supervisors and the enthusiasm brought by our 1512 PhD. students. This focus on scientific research in high-tech areas and cutting-edge technologies is proven by the outstanding innovation capabilities of our staff members that have produced nearly 65% of the Romanian patents in the last 10 years, which enabled our institution to win the *Creativity Trophy* issued by the National Register of Inventions and Trademarks in 2006.



## Alexandru Ioan Cuza University of Iași

Alexandru Ioan Cuza University of Iași is the oldest higher education institution in Romania. Since 1860, the university has been carrying on a tradition of excellence and innovation in the fields of education and research. With over 38.000 students and 800 academic staff, the university enjoys high prestige at national and international level and cooperates with over 250 universities world-wide. Alexandru Ioan Cuza University is a member of some of the most important university networks and associations: the Coimbra Group, EUA - European University Association, Utrecht Network, International Association of Universities, University Agency of Francophony and the Network of Francophone Universities (RUFAC). These partnerships offer us the opportunity to experience changes, to have student and teacher mobilities and joint academic, research and strategy programmes.

Alexandru Ioan Cuza University became the first student-centered university in Romania, once the Bologna Process was implemented. We believe in the power of individual choice and customized education. Thus, we became the first Romanian university to offer students the opportunity to choose both a major and a minor field of study, in a combination at their choice, that best suits their career goals.

Research at our university is top level. In 2008, for the third year in a row, Alexandru Ioan Cuza University was placed first in the national research ranking compiled on the basis of Shanghai criteria. Our teachers are involved in over 400 national and international research projects, with the logistic support of 24 research centres. Striving for excellence, the university takes unique initiatives to stimulate research quality, to encourage dynamic and creative education and to involve its best students in academic life.

Today, with its fifteen faculties, Alexandru Ioan Cuza University offers to all inquisitive young minds a large diversity of academic programmes which are aimed to open the way towards their personal fulfilment and social recognition. In a world characterized by rapid and profound changes, where knowledge is the most valuable asset, Alexandru Ioan Cuza University aims to strengthen the flexibility of learning, to create opportunities for the intellectual and professional development of its students, to assist quality research and to contribute to the society's cultural and economic growth.

## THE ORGANIZERS

### ROMANIAN INVENTORS FORUM

Romanian Inventors Forum (FIR), as a professional association of dialog and representation, has the purpose to support, stimulate, develop and valorize the scientifically, technically and artistically creativity. Under the aegis of FIR, Romanian Inventors have participated at more than 50 World Invention Exhibitions, where their creations have been awarded with orders, prizes and medals. The performance of Romanian inventics is renowned in the whole world, which is the reason why FIR became member in different international clubs, associations and federations, with special contributions.

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### FORUMUL INVENTATORILOR ROMÂNÎ

Forumul Inventatorilor Români (FIR), este o asociație profesională de dialog și reprezentare a inventicii românești în context internațional, care are drept scop sprijinirea, stimularea, dezvoltarea și valorificarea activităților de creație științifică, tehnică și artistică. Sub egida FIR, inventatorii români au participat la peste 50 de saloane mondiale de invenții, creațiile lor fiind apreciate cu numeroase ordine, premii și medalii. Performanța inventicii românești este recunoscută în întreaga lume, motiv pentru care FIR a devenit membru a diverselor cluburi, asociații și federații internaționale de profil, unde are contribuții deosebite.



## THE ORGANIZERS

### EUROPE DIRECT IAȘI

Association for Ecology and Sustainable Development is the host for Europe Direct Information Centre Iași. The EUROPE DIRECT Information Centre Iași assures the European information transfer to Romanian citizens and the feedback to the E.C., enhancing dialog between European institutions and the common citizen concerning to all European policies and the personal expectations.



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### EUROPE DIRECT IAȘI

Asociația pentru Ecologie și Dezvoltare Durabilă este structura gazdă a Centrului EUROPE DIRECT Iași. Acesta asigură transferul informației către cetățenii români și feed-back-ul către Comisia Europeană, facilitând dialogul între instituțiile europene și cetățeanul de rând, referitoare la toate problemele privind politicile europene și așteptările individuale.

## THE ORGANIZERS

### „GHEORGHE ASACHI” TECHNICAL UNIVERSITY OF IASI Faculty of Materials Science and Engineering

“Gheorghe Asachi” University of Iasi is an excellent choice for the highschool graduates, who wish to embrace a carrier in the attractive field of engineering. The eleven faculties of the university are well equipped and have renowned specialists.

The Faculty of Materials Science and Engineering at the "Gheorghe Asachi" Technical University of Iasi has the mission to train specialists for the materials engineering, mechanical engineering and industrial engineering fields, through a 4-year programme (B.Sc.), Master Courses and Ph.D. Programmes. Also, our faculty is involved in the scientific research programmes, as well as in life-long education programmes for professionals that wish to extend their expertise. Besides the formative activity, research in various fields, focused to multi-disciplinary national and international co-operation is highly valued.

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### UNIVERSITATEA TEHNICĂ “GHEORGHE ASACHI” IAȘI Facultatea de Știința și Ingineria Materialelor

Universitatea Tehnică din Iasi este o alegere excelenta pentru absolventii de liceu care s-au hotarat sa imbratiseze o cariera in domeniul provocator al ingineriei. Cele unsprezece facultati ale universitatii sunt dotate cu laboratoare si echipamente de ultima ora, unde isi desfasoara activitatea specialisti recunoscuti pe plan european si international.

Facultatea de Știința și Ingineria Materialelor din cadrul Universității Tehnice "Gh. Asachi" din Iași, are ca misiune pregătirea specialiștilor pentru domeniul ingineriei materialelor, ingineriei mecanice și ingineriei industriale, prin programe de licență (4 ani), masterat și doctorat. De asemenea, facultatea este implicată în proiecte de cercetare și în programe de perfecționare pentru specialiștii. Valoarea personalul academic din cadrul facultății aduce o notă distinctivă predării ingineriei materialelor. Pe lângă activitatea de formare și de cercetare în diverse domenii de activitate, apreciable sunt și cooperările multi-disciplinare naționale și internaționale.

## THE ORGANIZERS

### ALEXANDRU IOAN CUZA UNIVERSITY OF IASI

The Alexandru Ioan Cuza University of Iași is the oldest higher education institution in Romania. Since 1860, the university has been carrying on a tradition of excellence and innovation in the fields of education and research. With over 38.000 students and 800 academic staff, the university enjoys a high prestige at national and international level and cooperates with over 250 universities world-wide. The Alexandru Ioan Cuza University became the first student-centered university in Romania, once the Bologna Process was put into practice. Research at our university is top level. For the second year in a row, the University is placed first in the national research ranking. Striving for excellence, the university takes unique initiatives to stimulate research quality, to encourage dynamic and creative education and to attract the best students to academic life.

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Universitatea "Alexandru Ioan Cuza" este cea mai veche instituție de învățământ superior din România continuând, din anul 1860, o tradiție a excelenței și inovației în educație și cercetare. Cu peste 38.000 de studenți și 800 de cadre didactice, universitatea se bucură de un important prestigiu la nivel național și internațional, având colaborări cu peste 250 de universități din străinătate. Universitatea "Alexandru Ioan Cuza" este membră a unora dintre cele mai importante asociații și rețele universitare: Grupul Coimbra, EUA - Asociația Europeană a Universităților, Rețeaua Utrecht, IAU - Asociația Internațională a Universităților, AUF - Agenția Universitară a Francofoniei și RUFAC - Rețeaua Universităților Francofone. Acestea permit schimbul de experiență, mobilități ale studenților și profesorilor și realizarea în comun a unor programe academice, de cercetare sau strategice.

## THE ORGANIZERS

### „GRIGORE T. POPA” UNIVERSITY OF MEDICINE AND PHARMACY OF IASI

Universitatea de Medicină și Farmacie „Grigore T. Popa” din Iași a fost fondată în 1879, fiind una dintre cele mai vechi instituții de învățământ superior din România. UMF Iași face parte din Grupul celor 12 Universități de Educație și Cercetare Avansată. Cele patru facultăți – Facultatea de Medicină, Facultatea de Medicină Dentară, Facultatea de Farmacie și Facultatea de Bioinginerie Medicală – sunt acreditate de Asociația Română de Asigurare a Calității în Învățământul Superior (ARACIS) iar managementul educațional instituțional este certificat de forul european de evaluare European University Association (EUA) și de Consiliul Internațional al Decanilor Facultăților de Medicină de Expresie Franceză (CIDMEF). Dintre cei 13.987 de studenți, masteranzi, doctoranzi și rezidenți ai săi (8.508 studenți, 321 masteranzi, 359 doctoranzi și 2.256 rezidenți), 2.534 provin din 49 de țări altele decât România, ceea ce face Universitatea de Medicină și Farmacie „Grigore T. Popa” din Iași cea mai cosmopolită instituție de învățământ superior din estul Europei. Reputația internațională de care se bucură UMF Iași este întărită și faptul că putem întâlni absolvenți ai Universității în toate spitalele mari din lume și în cele mai importante centre de cercetare. Raportul de evaluare din 2016 al European University Association (EUA) - Institutional Evaluation Programme (IEP) califică Universitatea de Medicină și Farmacie “Grigore T. Popa” din Iași drept lider regional și național în domeniului învățământului superior.

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„Grigore T. Popa” University of Medicine and Pharmacy of Iasi was founded in 1879 and it is one of the oldest institutions of higher education in Romania. The University is proud to be part of the 12 Universities of Advanced Education and Research. The four faculties - Faculty of Medicine, Faculty of Dentistry, Faculty of Pharmacy and the Faculty of Medical Bioengineering - are accredited by the Romanian Association for Quality Assurance in Higher Education (ARACIS) and its institutional management is certified by the European forum for evaluation- European University Association (EUA) and by CIDMEF (Conférence Internationale des Doyens et des Facultés de Médecine d'Expression Française). Of the 13 987 students, master students, PhD students and its medical residents (8508 students, 321 graduates, 359 PhD students and 2,256 medical residents), 2,534 come from 49 countries other than Romania, which makes "Grigore T. Popa " University of Medicine and Pharmacy of Iasi one of the most cosmopolitan institution of higher education in eastern Europe. The University's international reputation is also sustained by the fact that you can find its graduates in all major hospitals in the world and even in the most important research centers. The 2016 evaluation report of the European University Association (EUA) - Institutional Evaluation Programme (IEP) describes the "Grigore T. Popa" University of Medicine and Pharmacy as a regional and national leader in higher education.

## THE ORGANIZERS

### The National Institute for Research and Development in Environmental Protection (INCDPM)

INCDPM is an institution with over 60 years of experience in the environmental protection field. INCDPM, through its activities, that involve the concept of sustainable development, ensures the development of win-win preventive solutions, adopted in an environmental friendly manner. The development of new monitoring and evaluation methods for various fields (environmental quality, habitats - avifauna and ichthyofauna) generates, develops and maintains the necessary knowledge for the elaboration of solutions that ensure the conservation status of nature and biodiversity. The institute also uses the most advanced techniques and research equipment, and develops partnerships with prestigious international institutions and with public and private national institutions. The research portfolio includes assessing and reducing the impact of natural and technological hazards, assessing climate change impact, numerical simulations and forecasts, renewable energies, etc.



**INCDPM**

Institutul Național de  
Cercetare Dezvoltare  
pentru Protecția Mediului

București, Splaiul Independenței nr.294  
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Institutul Național de Cercetare și Dezvoltare pentru Protecția Mediului (INCDPM), reprezintă o instituție cu peste 60 de ani de experiență în domeniul protecției mediului. INCDPM, prin intermediul activităților pe care le desfășoară, coroborate cu conceptul de dezvoltare durabilă, asigură elaborarea unor soluții preventive de tip câștig-câștig, prietenoase cu mediul. Astfel, prin dezvoltarea de metode de monitorizare și evaluare pentru diverse domenii (calitatea mediului, habitate-avifaună și ihtiofaună) se generează, dezvoltă și se mențin cunoștințele necesare elaborării de soluții care să asigure starea de conservare a naturii și biodiversității. De asemenea, institutul utilizează cele mai avansate tehnici și echipamente de monitorizare, având direcții și arii de cercetare conexe, dezvoltând parteneriate cu instituții de prestigiu din străinătate și instituții naționale, din sectorul public și privat. Portofoliul de cercetare cuprinde evaluarea și reducerea impactului hazardelor naturale și tehnologice, evaluarea impactului schimbărilor climatice, simulări și prognoze numerice în domeniu, energii regenerabile etc. Pe lângă acestea, monitorizarea traseelor de migrare a sturionilor, generează o bază de date unică la nivel mondial.

General Director: C.S.I. habil. Eng. DEÁK György, PhD

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CREATIVITY IS THE  
MISSING PUZZLE!

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# International Conference on Innovative Research EUROINVENT – ICIR 2019

### Organized by:

- ▲ **Romanian Inventors Forum**
- ▲ **Faculty of Materials Science and Engineering, The “Gheorghe Asachi” Technical University of Iasi, Romania**
- ▲ **ARHEOINVEST Platform, Alexandru Ioan Cuza University of Iasi**
- ▲ **Centre of Excellence Geopolymer and Green Technology (CEGeoGTech), Universiti Malaysia Perlis (UniMAP)**

### With support of:

- ▲ **International Federation of Inventors' Associations - IFIA**
- ▲ **World Invention Intellectual Property Associations - WIIPA**

**Chairman: Prof.Dr.Eng. Petrica VIZUREANU**

The “Gheorghe Asachi” Technical University of Iasi, Romania

**Event Coordinator: Lecturer Dr.Eng. Andrei Victor SANDU**

Romanian Inventors Forum &  
The “Gheorghe Asachi” Technical University of Iasi, Romania

**International Conference on Innovative Research  
EUROINVENT – ICIR 2019**

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EUROINVENT – ICIR 2019**

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## EUROINVENT JOINT PROGRAM

EUROINVENT Exhibition	EUROINVENT ICIR Conference
<b>DAY 1 – THURSDAY MAY 16</b>	
08.00 Stand setup for participants	8.00 Participants registration
10.30	<b>Artistic moment</b>
<b>11.00</b>	<b>EUROINVENT Opening Ceremony</b>
13.00 First Jury Meeting	<b>12.00 ICIR Opening Ceremony</b>
13.30 Jury evaluation (I)	12.10 Keynote Speaker
Visiting	12.40 Invited Speaker 1
Demonstrations of inventions	13.00 Lunch
17.00 End of exhibition day	14.00 Poster Session
	14.30 Plenary Session 1
	16.00 Plenary Session 2
	17.30 End of conference day
<b>DAY 2 – FRIDAY MAY 17</b>	
10.00 Exhibition start	09.00 Invited Speakers
10.10 Jury evaluation (II)	10.00 Plenary Session 3
11.00 Media Interviews	11.30 Plenary Session 4
14.00 <b>Jury Final Meeting</b>	13.00 Poster Session
16.00 <b>Book Award Ceremony</b>	14.00 Break for lunch (individual)
17.00	Exhibition Closure and tear down
19.00	<b>Cocktail Dinner + Delegations Award Ceremony</b>
<b>DAY 3 - SATURDAY MAY 18</b>	
10.00 Workshop PCCDI60 - 2018	
13.00 <b>Euroinvent Award ceremony</b>	
15.00 Farewell Message	

16<sup>th</sup> of May  
**Opening Ceremony**  
**EUROINVENT Festival of Creativity**

16-17 of May  
XI<sup>th</sup> edition of **EUROINVENT**  
International Conference on Innovative Research

16-17 of May  
V<sup>th</sup> edition of **ICIR EUROINVENT**  
International Conference on Innovative Research

18<sup>th</sup> of May  
***Excellence in Research and Innovation –***  
***EUROINVENT***  
***11<sup>th</sup> Edition Award Ceremony***

## EUROINVENT INTERNATIONAL JURY

- Honorary President:** **Kane KRAMER**  
British Inventors Society (United Kingdom)
- President:** **Mohd Mustafa Al BAKRI ABDULLAH**  
Universiti Malaysia Perlis (Malaysia)
- Vice-Presidents:** **Alireza RASTEGAR**  
International Federation of Inventors' Association (IFIA) - President  
**Ljiljana PEDISIC**  
Croatian Inventors Association (Croatia)
- Members:**
- Layth ALLALAK**  
Iraqi Forum of Inventors (IRAQ)
- Mircea BERNIC**  
Technical University of Moldova (R.Moldova)
- Hakan BAYRAM**  
ABDER (Turkey)
- Majid EL BOUAZZAOU**  
Union of Inventors (Morocco)
- Dorica BOTAU**  
Banat's USAMV "King Michael I of Romania" Timisoara (Romania)
- Moonsuk CHANG**  
TISIAS (Canada)
- Ofelia CORBU**  
Technical University of Cluj-Napoca (Romania)
- Ayhan DADASH**  
Turkish Inventors Association – TUMMIAD (Turkey)
- Gyorgy DEAK**  
N.I.R.D. in Environmental Protection Bucharest (Romania)
- Gabi DROCHIOIU**  
Alexandru Ioan Cuza University of Iasi (Romania)

## EUROINVENT INTERNATIONAL JURY (II)

**Alina FODEA**

AGEPI Moldova (R.Moldova)

**Gihan FARAHAT**

Egyptian Council for Innovation and Privacy of Information (Egypt)

**Maria HARJA**

“Gheorghe Asachi” Technical University of Iasi (Romania)

**Mohammad Ali HUMRAN**

The Union of Arabian Academics (Yemen)

**Rodica Mariana ION**

Valahia University, Targoviste + ICECHIM Bucharest (Romania)

**Tudor LUPASCU**

Institute of Chemistry of Academy of Science of Moldova (Moldova)

**Aurelia LUPAN**

AGEPI Moldova (R.Moldova)

**Alexandru MARIN**

Politehnica University of Bucharest (Romania)

**Mircea MANOLESCU**

iSENTINEL (Romania)

**Daniel Petre MATASARU**

“Gheorghe Asachi” Technical University of Iasi (Romania)

**Fernando Maldonado LOPES**

INVENTARIUM-SCIENCE (Portugal)

**Viorel NACU**

N. Testimitanu University of Medicine and Pharmacy (R.Moldova)

**Ovidiu NEMES**

Technical University of Cluj-Napoca (Romania)

**Phan Quoc NGUYEN**

Technical Vietnam National University, Hanoi

**Doru Dumitru PALADE**

Politehnica University of Bucharest (Romania)

**Cristian PREDESCU**

Politehnica University of Bucharest (Romania)

**Silviu Mihai PETRISOR**

Nicolae Balcescu Land Forces Academy (Romania)

**Ion SANDU**

Romanian Inventors Forum (Romania)

## EUROINVENT INTERNATIONAL JURY (III)

**Yuriy SKOMOROVSKIY**

Centre Alyumel Sevastopol (Russia)

**Unchalee SANGUANPONG**

ATIP (Thailand)

**Luminita SCRIPCARIU**

“Gheorghe Asachi” Technical University of Iasi (Romania)

**Augustin SEMENESCU**

Politehnica University of Bucharest (Romania)

**Alexandru STANILA**

“Gheorghe Asachi” Technical University of Iasi (Romania)

**Henriette SZILAGYI**

INCD Urban Incerc Cluj Napoca (Romania)

**Daniela TARNITA**

University of Craiova (Romania)

**Mihail Aurel TITU**

“Lucian Blaga” University of Sibiu (Romania)

**Constantin UNGUREANU**

Stefan cel Mare University of Suceava (Romania)

## Jury of European Visual Art Exhibition

President: **Constantin TOFAN**  
"G.Enescu" Art University Iasi, UAP Iasi

Members: **Valentin SAVA**  
"G.Enescu" Art University Iasi, UAP Iasi

**Atena Elena SIMIONESCU**  
"G.Enescu" Art University Iasi, UAP Iasi

**Mihai TARASI**  
"G.Enescu" Art University Iasi, UAP Iasi

**Dragos PATRASCU**  
"G.Enescu" Art University Iasi, UAP Iasi

**Bogdan TEODORESCU**  
"G.Enescu" Art University Iasi, UAP Iasi

**Cristian UNGUREANU**  
"G.Enescu" Art University Iasi, UAP Iasi



## Jury of Book Salon

- President:** **Constantin LUCA**  
"Gheorghe Asachi" Technical University of Iasi
- VicePresident:** **Anca GALACTION**  
„Grigore T. Popa” University of Medicine and Pharmacy  
**Valentin NEDEFF**  
„Vasile Alecsandri” University of Bacau
- Members:** **Diana Biatrice ANDRON**  
"George Enescu" Art University Iasi  
**Carmen Luiza COSTULEANU**  
„Ion Ionescu de la Brad” University Agriculture Science and Veterinary Medicine  
**Maria BOLAT**  
„Grigore T. Popa” University of Medicine and Farmacie  
**George BONDOR**  
"Alexandru Ioan Cuza" University of Iasi  
**Catalin BORDEIANU**  
"Gheorghe Asachi" County Library Iasi  
**Mihai BRANZILA**  
"Alexandru Ioan Cuza" University of Iasi  
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**Dana LUNGU**  
"Alexandru Ioan Cuza" Publishing House  
**Diana Mihaela MARDARE**  
"Alexandru Ioan Cuza" University of Iasi  
**Emilian MOSNEGUTU**  
„Vasile Alecsandri” University of Bacau  
**Radu ROSCA**  
„Ion Ionescu de la Brad” University Agriculture Science and Veterinary Medicine  
**Anca Maria RUSU**  
"George Enescu" Art University Iasi  
**Valentin SAVA**  
"George Enescu" Art University Iasi  
**George UNGUREANU**  
„Ion Ionescu de la Brad” University Agriculture Science and Veterinary Medicine  
**Daniela Fulga VLAD**  
Radio Romania Iași

## AWARDS LIST

### **Euroinvent GRAND PRIZE**

**The Youngest Inventor Award  
The Woman Inventor Award  
The Oldest Inventor Award  
The Green Environment Award  
The Medicine Award  
The Best Design Award  
The Exquisite Award  
The AgroFuture Prize  
The CyberLife Award  
The Popularity Award  
Special Prize**



**Gold Medal  
Silver Medal  
Bronze Medal**

**Prize of Croatia – Croatian Inventors Network  
Prize of Malaysia - Universiti Malaysia Perlis  
Prize of Turkey - TUMMIAD  
Prize of Poland - Eurobusiness Haller  
Prize of Poland – Association of Polish Inventors  
Prize of Thailand - ATIP  
Prize of Iraq – Iraqi Inventors Forum  
Prize of Indonesia – INNOPA  
Prize of Canada – TISIAS  
Prize of Moldova - AGEPI Chisinau  
Prize of Moldova - Academy of Science of Moldova  
Prize of Moldova - Technical University of Moldova  
Prize of Romanian Inventors Forum  
Prize of Europe Direct Iasi  
Prize of „Gheorghe Asachi” Technical University of Iasi  
Prize of „Alexandru Ioan Cuza” University of Iasi  
Prize of POLITEHNICA University of Bucharest  
Prize of Stefan cel Mare University of Suceava  
Prize of Banat USAMV, Timisoara  
Prize of Technical University of Cluj-Napoca  
Prize of Arheoinvest Platform  
Special Prizes from Participant Institutions**

**EXHIBITS CLASSIFICATION**

<b>1</b>	<b>Environment - Pollution Control</b>
<b>2</b>	<b>Energy and sustainable development</b>
<b>3</b>	<b>Agriculture and Food Industry</b>
<b>4</b>	<b>Medicine – Health Care – Cosmetics</b>
<b>5</b>	<b>Industrial and laboratory equipments</b>
<b>6</b>	<b>Mechanical Engineering – Metallurgy</b>
<b>7</b>	<b>Buildings and Materials</b>
<b>8</b>	<b>Aviation, car industry and transportation</b>
<b>9</b>	<b>Chemical and Textile Industry</b>
<b>10</b>	<b>Information Technology and Communication</b>
<b>11</b>	<b>Printing and advertising</b>
<b>12</b>	<b>Safety, protection and rescue of people</b>
<b>13</b>	<b>Sports, Games and Leisure</b>
<b>14</b>	<b>Other</b>
<b>X</b>	<b>Innovative Research</b>

## **P R E A M B L E**

The Inventions' exhibitions and shows, national or international ones, represent one of the exogenous determining factors, with multiple effects on the creative process. The system is one of the most encouraging, an interactive manner to disseminate inventions, a competitive background generating innovative ideas, while as an evaluative scientometric system, allow attracting the potential applicants or inventions' owners. It is the best medium for negotiating, conveying or transferring inventions, the place where the complete new results are exhibited.

The past 30 years experience, a time in which many Romanian inventors took their new releases in international exhibitions and were rewarded with numerous medals, orders, distinctions and diplomas, situated each time Romania, in unofficial statistics, on the first places. The honours list of the Romanian inventions create a paradoxal result of the two very close fields, the technological or applied research and on the other hand the fundamental or scientifically research. If the scientific output, represented by papers published in ISI Thomson acknowledged journals, situate Romania dragging behind the second league, in compensation, the patented awarded inventions turn it in one of first countries. So much more we should focus especially on the organizing of this kind of shows which offer real opportunities to many inventors to see their dreams come true by putting their results into a competitive-interactive system of evaluation.

Interdisciplinarity of inventics as a science is approached today in a connected, integrated way (education-research-production), with both educative and research functions, carrying great attractivity for the young generation and increasing standards both for inventors and for their products. In this respect, it is necessary to pay a special attention to the inventics schools, as they have, beside the role to form characters, professions, as well as vocations and talents, the mission to stimulate the technical creativity. We should underline the fact that after 1990 we noticed a slight lowering of the Iași inventics school contribution in its aim to form young inventors. Meetings and workshops in the inventions exhibitions should put light on and find

solutions to turn the inventics schools in institutions and to improving and harmonizing the laws regarding the intellectual propriety and the industrial one.

Another serious, upsetting and alarming aspect which I want to put light on is the fact that about 60 to 70% of the Romanian specialists with international output accepted to work abroad, where they are appreciated and stimulated according to their value. We should as well attract them and offer the opportunity to reevaluate them selves at home and participate to such representative competitions.

A peculiar notice is the fact that many Romanian inventors of success, internationally acknowledged, are invited in organizing committees, in international juries and are active members or founders of associations or professional clubs. The Romanian delegations created a tradition in the international exhibitions, to organize a Romanian event, the so-called “The Romanian Inventors Day”, where they present in a festive atmosphere their inventions, their contributions and offer diplomas and small gifts to the hosts and the other participants.

This eleventh edition of EUROINVENT sent invitations to inventors associations from many countries, as Bosnia and Herzegovina, Bulgaria, Cambodia, Canada, China, Croatia, Egypt, Hong Kong, India, Indonesia, Iran, Iraq, Japan, Kazakhstan, Korea, Lebanon, Macedonia, Malaysia, Mexico, Morocco, Moldova, Philipines, Poland, Portugal, Russia, Saudi Arabia, Sudan, Taiwan, Thailand, Turkey, Ukraine, United States of America, Vietnam. A big number of institutions and individual inventors are participating from Romania, a remarkable fact being to have here many young inventors (from schools or universities) as well as older inventors. This show is exhibiting more than 600 inventions and research projects from over 30 countries.

With pleasure and gratitude, acknowledgements to all the persons, institutions and organizations who participate to EUROINVENT, to the partners, Romanian Inventors Forum, EUROPE-DIRECT Iasi, “Gheorghe Asachi” Technical University of Iași and “Alexandru Ioan Cuza” University of Iasi and all the partners for all their support and efforts to organize the events.

Prof. Ion SANDU – Honorary President of Romanian Inventors Forum

## ORGANIZERS



Romanian Inventors Forum



Europe Direct Iasi



Alexandru Ioan Cuza  
University of Iasi



Gheorghe Asachi Technical  
University of Iasi



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**INCDDPM**

National Institute for  
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in Environmental Protection

Bucharest, 294 Splaiul Independenței  
România



COMPLEXUL  
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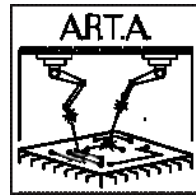


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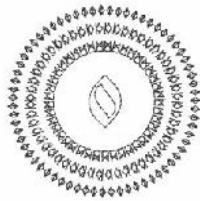
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Fundația Dan Voiculescu  
pentru Dezvoltarea României  
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### Cine suntem?

**Fundația Dan Voiculescu pentru Dezvoltarea României** este o organizație non-guvernamentală, apolitică, înființată în anul 1990, care prin activitatea sa, urmărește valorificarea capitalului uman prin descoperirea, antrenarea și promovarea inteligenței și a excelenței.

### Ce facem?

**Susținem Excelența** – organizația noastră a susținut și susține, tineri extraordinari din diverse domenii de activitate

**Antrenăm Inteligența** – peste 5000 de copii au participat, de-a lungul timpului la cursurile gratuite organizate de noi

**Promovăm inovația** – oferim inventatorilor și cercetătorilor români sprijinul de care au nevoie pentru a-și continua cercetările







# 28

## de ani de activitate

\* peste 5.000 de tineri cu performanțe remarcabile au beneficiat de programele FDVDR numai în ultimii 6 ani

\* 2.000 de copii, cu vârsta între 4 și 18 ani, au participat la cursurile FDVDR

\* mai mult de 200 de spectacole, concerte și evenimente cultural-educaționale doar în ultimii 3 ani

### Membru al European Council for the High Ability

\* peste 50 de programe și proiecte pe termen mediu și lung în domeniul educațional, cultural și social, unele dintre acestea în curs de desfășurare

\* premiarea și susținerea actorilor tineri în cadrul evenimentului Gala Teatrului Tânăr

## 4.000.000 €

### investiți în educație

### Membru al World Council for Gifted and Talented Children

# 2000

## de premii

\* cel mai mare premiu individual din istoria recentă a României, în valoare de 300.000 RON, decernat în 2007, inventatorului Justin Capră

\* premiu de 10.000 lei, oferit la Euroinvent

\* recunoașterea adevăratelor valori naționale prin acordarea de premii de excelență pentru: Radu Beligan, Gabriella Ficz sau Tudor Gheorghe



Valorificarea capitalului uman intelectual (tangibil și intangibil) a reprezentat o provocare pentru România și pentru elitele care au încercat uneori, deși în mod inconstant și incoerent, să creeze o arhitectură specifică prin care să asigure evoluția țării pe plan cultural, tehnic și științific.

Explorarea acestui capital a fost, pe rând, preocuparea unor personalități de marcă ale culturii române, precum Spiru Haret, Titu Maiorescu, Grigore Moisiu, Emil Racoviță, Henri Coandă, Ana Aslan, Virginia Andreescu Haret, Alice Voinescu și mulți alții etc.

Senatul Științific al FDVDR, format din personalități remarcabile ale științei și cercetării românești își asumă misiunea de a continua acest deziderat de ordin intelectual și științific și de a contribui la procesul de formare a noilor elite.

Senatul Științific al Fundației Dan Voiculescu pentru Dezvoltarea României reprezintă demersul cu care ne simțim datori pentru a schimba, fie și cu puțin, ceva din realitatea zilelor noastre. Dorim să oferim inginerilor, cercetătorilor, inventatorilor români puțin din sprijinul care le lipsește, nu doar aplauze simbolice și platitudini retorice.

Investițiile în cercetare și inovare sunt esențiale pentru viitorul omenirii!  
De aceea, îmbinând cercetarea și inovarea și punând accentul pe excelența științifică, dezvoltăm cel mai bun mediu pentru o cooperare multidisciplinară responsabilă și dinamică în materie de tehnologii noi și viitoare.



11

Editions of

EUROINVENT

16

Years of excellence with

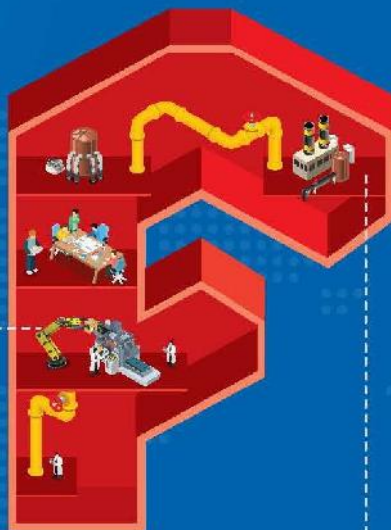
ROMANIAN INVENTORS FORUM



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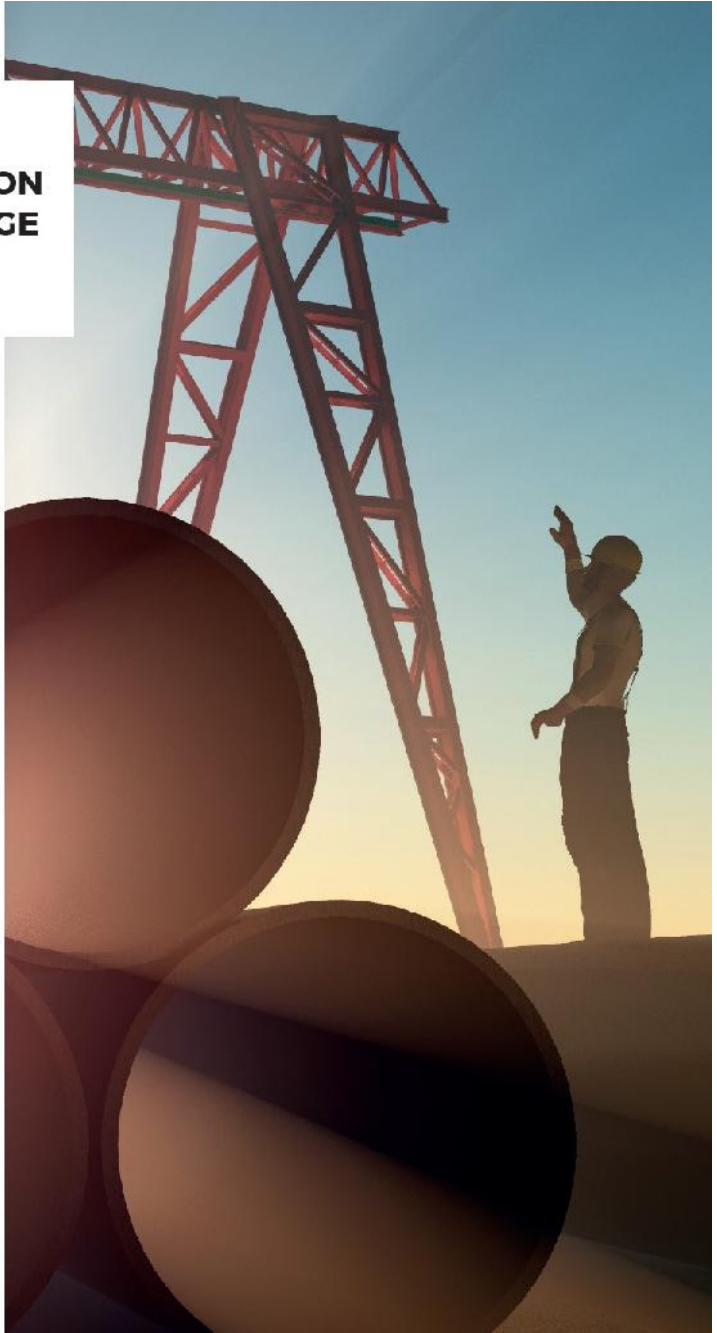


Our international  
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We are passionate about the  
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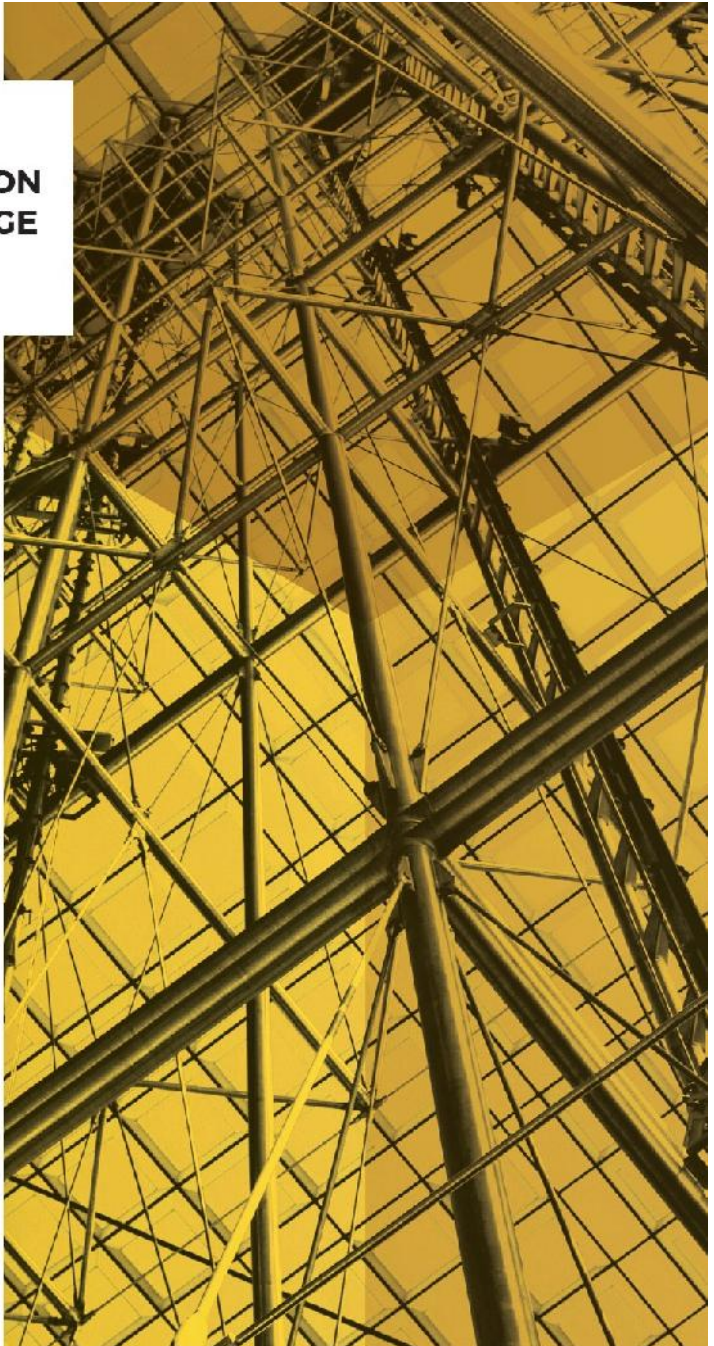
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Asigură-te că ai înțeles riscurile asociate contractelor de credit, în principal cu privire la variația FOBOR, fluctuația veniturilor tale, precum și riscul valutar pentru creditele acordate în valută. Consecințele neantunării pot fi raportarea la Biroul de Credit și la Centrala Riscurilor Bancare, precum și declanșarea procedurilor de recuperare.





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Un punct forte privind portofoliul „Hofigal” il reprezinta faptul ca toate produsele sunt obtinute pe baza unor retete si tehnologii proprii, brevetate in tara si reprezinta premiere mondiale absolute.

Obiectivele majore ale companiei sunt de a aplica conditiile si masurile privind asigurarea calitatii, eficacitatii si sigurantei tuturor produselor, precum si obținerea de ingrediente farmaceutici activi de natura vegetala garantata ce corespund in totalitate normelor ecologice internationale in vigoare. Toate etapele procesului, de la cultivare (pre-procesare, procesare planta), pana la faza de produs finit sub forma de medicamente, suplimente alimentare, cosmetice, ceaiuri, respecta cerintele internationale privind cultivarea si recoltarea plantelor, precum si Regulile GMP. Din punct de vedere al calitatii produselor, indiferent de etapa, acestea indeplinesc cerintele Farmacopeei Europene, completate cu cele ale altor farmacopei de circulatie internationala si ale conditiilor de calitate proprii filosofiei Hofigal.

Laboratoarele de control al calitatii produselor sunt dotate cu echipamente moderne, conforme cerintelor referentialelor de mai sus si opereaza cu un personal instruit si cu experienta, in care toate materiile prime procurate sau proprii, controalele interfazice pe parametri critici si produsele finite sunt analizate.

Toate liniile de fabricatie respecta cerintele GMP internationale in vigoare:

- fluxul de fabricatie „Forme Solide Dozate” (comprimate, capsule, capsule filmate);
- fluxul de fabricatie „Solutii de Uz Intern/Extern”;
- fluxul de fabricatie „Extracte Vegetale”;
- fluxul de fabricatie „Supozitoare si Ovule, Cosmetice monodoze”;
- fluxul de fabricatie „Ceaiuri”;
- fluxul de fabricatie „Cosmetice, Semisolide”

Echipamentele de fabricatie, de masura si control sunt de fabricație occidentala si de ultima generație.

Produsele portofoliului Hofigal reprezinta premiere pe plan mondial: *cea mai mare concentrație de β-caroten in ulei de cătina, de proteina in Spirulina, Coenzima Q10 in ulei de cătina.*

Aceste produse sunt rezultatul unei indelungate si sustinute activitati de cercetare sau dezvoltare desfășurate in laboratoarele noastre de către colectivul propriu de cercetători, doctori in științe (farmacisti, ingineri chimisti, medici, biologi, microbiologi, biochimisti, chimisti, agronomi). Acest colectiv colaboreaza cu cele mai importante instituții de învățământ superior si Institute Nationale de Cercetare si Dezvoltare din Romania.

Urmare a acestor activități nomenclatorul de produse realizate de „*Hofigal*” a crescut de la 3 produse in anul 1990, la peste 450 in 2008.

Preocupati de studiul si introducerea de Terapii Noi, recent am adaugat un element novator portofoliului Hofigal: gama **Gemoderivate**, sub forma de extracte hidroglicerolcoolice in dilutie 1:10, obtinute din tesuturi vegetale proaspete aflate in faza de crestere (muguri, boboci, amenti, mladite, scoarta ramurilor tinere, scoarta interna a radacinilor, seva, seminte). Acestea sunt formate din tesuturi embrionare care concentreaza intreaga energie si informatie genetica a plantei, fiind mai bogate in vitamine, oligoelemente, minerale, acizi nucleici sau factori de crestere decat planta insasi.

Exemplificam gemoderivatele 1 DH din: *afin negru, alun, arin negru, artar de campie, brad alb, castan salbatic, carpen alb, catina rosie, coacaz negru, dud negru, fag, frasin, ienupar, lemn cainesc, liliac, maces, mestecan alb si pufos, mur, nuc, paducel, pin, plop, porumb, porumbar, rozmarin, salcie, sanger, stejar, tei argintiu, ulm, vita de vie, zmeur.*

Valorificarea materialului vegetal obtinut de firma noastra are in vedere si domenii adiacente, deja aflate in studiu, cum ar fi: supernucleele pentru zootehnie (polivitamine), insectofungicide naturale vegetale netoxice.

Produsele noastre pot fi găsite in toate farmaciile din Romania.

Totodata Hofigal Export Import S.A. are si o rețea proprie de farmacii. In cadrul acestora produsele Hofigal se vând fără adaos comercial, adică cu costul de producție, in timp ce adaosul comercial pentru celelalte produse farmaceutice este mai mic decât in toate celelalte farmacii, cu excepția produselor cu preț fixat de Ministerul Sănătății.

In incinta fiecarei farmacii Hofigal exista amenajat un cabinet de consultanta, in cadrul căruia medici autorizati, angajati ai Hofigal, cu pregătire atât in domeniul alopatiei, fitoterapiei cat si al homeopatiei, acorda gratuit consiliere oricărei persoane interesate de portofoliul Hofigal.

**O initiativa a firmei a fost infiintarea *Complexul de terapie naturală “Alexandra”***

Prin întreaga sa activitate „*Hofigal*” este promotorul celor mai înaintate si moderne concepte legate de fabricatia nepoluanta. De la materiile prime pana la produsele finite, totul este natural, curat si nepoluat.

**Nici un produs Hofigal nu are contraindicații sau efecte adverse !**

„Natura nu minte niciodata...”

Mihai Eminescu

București, Intrarea Serelor nr.2, sector 4;

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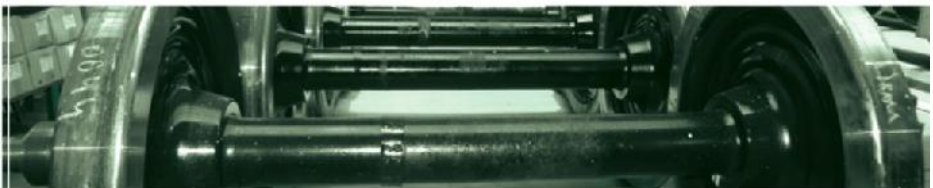
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**vitamin aqua** răspunde prin variantele sale la cele patru segmente esențiale actuale de necesități: hidratare, revigorare, sănătate (*wellness*) și controlul greutății. Ca băutură cu funcționalitate benefică, apa vitaminizată cunoaște un feedback pozitiv în rândul consumatorilor, fiind percepută ca o sursă excelentă de nutrienți vitali. Se încadrează ca produs în cele trei trenduri majore de consum: Health (sănătate); Convenience (portabilitate); Premium.

Prin transparența informațiilor și mențiunile de sănătate prezente pe etichetele celor cinci sortimente, **vitamin aqua** se identifică cu nevoile în creștere ale indivizilor pentru o informare corectă și onestă.

Gama largă de adresabilitate a produsului este dată de creșterea preocupărilor în rândul persoanelor active pentru îmbunătățirea stilului lor de viață. Mai mult, culorile, ambalajul și portabilitatea produsului fac din cele cinci sortimente **vitamin aqua** accesorii care reflecta personalitatea, indiferent de stilul de viață, a persoanelor interesate în a consuma produse premium.

Dimineața în mașină în drum spre locul de muncă, la școală, în vacanțe, în pauzele dintre mail-uri, când petreci, la apus, când simți nevoia de revigorare, la ski sau la o tură cu bicicleta, unul din cele cinci sortimente **vitamin aqua** disponibile va răspunde cu siguranță nevoii resimțite într-un anumit moment al zilei, indiferent de anotimp.

[www.vitaminaqua.ro](http://www.vitaminaqua.ro)  
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They are specialized in trademarks, community registered designs and geographical indications, looking forward to a patent division any time soon. In a world where novelty is everything, ProtectMARK represents their clients before the Romanian Office for Trademarks and Patents (OSIM), the Office for the Harmonization of the Internal Market (OHIM) and the World Intellectual Property Organization.

Their consultancy services include: analyzing a company's trademark portfolio, research and search reports, registration and renewal of trademarks, designs and geographical indications, monitoring registered trademarks, filing oppositions and cancellations against other similar trademarks, filing points of view, representation before the Offices etc.

Alongside their clients, ProtectMARK develops the trademark portfolio strategy and offers legal advice on risk management, continuous growth and market protection. For the benefits of their clients, ProtectMARK offers the best advice regarding intellectual property rights so that no infringement of rights occur. Moreover, they aid their clients in other aspects, such as transfer or licensing of trademarks.

With clients as Fiterman Pharma, Iași City Council, Iași City Hall, Oameni și Companii, Colegiul Național Emil Racoviță, EDUMANAGER, Children Academy, FIDELIA CASA, OXYGEN, ELEMATIS, REGALLIA, HOLTZMETALL, their services target growing businesses as well as some key players from Iași's business world.



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## Oficiul de Stat pentru Invenții și Mărci

Str. Ion Ghica Nr.5 Sector 3, Bucuresti  
Tel.021.3060800-29; Fax:021.312.38.19; [office@osim.ro](mailto:office@osim.ro); [www.osim.ro](http://www.osim.ro)

**Oficiul de Stat pentru Invenții și Mărci (OSIM)** își desfășoară activitatea ca organ de specialitate al administrației publice centrale, având autoritate unică pe teritoriul României în asigurarea protecției proprietății industriale, în conformitate cu legislația națională în domeniu și cu prevederile convențiilor și tratatelor internaționale.

Atribuții specifice ale O.S.I.M. conform obiectului său de activitate:

- înregistrează și examinează cererile din domeniul proprietății industriale, eliberând titluri de protecție care conferă titularilor drepturi exclusive pe teritoriul României.
- este depozitarul registrelor naționale ale cererilor depuse și ale registrelor naționale ale titlurilor de protecție acordate pentru invenții, mărci, indicații geografice, desene și modele industriale, topografiile de produse semiconductoare și noilor soiuri de plante;
- editează și publică Buletinul Oficial al Proprietății Industriale al României;
- editează și publică fasciculele brevetelor de invenție;
- administrează, conservă și dezvoltă, întreținând o bază de date informatizată;
- efectuează, la cerere, servicii de specialitate în domeniul proprietății industriale;
- desfășoară cursuri de pregătire a specialiștilor în domeniul proprietății industriale;
- editează și publică Revista Română de Proprietate Industrială;
- atestă și autorizează consilierii în domeniul proprietății industriale, ținând evidența acestora în registrul național.



## State Office for Inventions and Trademarks

Str. Ion Ghica Nr.5 Sector 3, Bucuresti  
Tel.021.3060800-29; Fax:021.312.38.19; [office@osim.ro](mailto:office@osim.ro); [www.osim.ro](http://www.osim.ro)

OSIM carries out its activity as a specialized government body having sole authority over the territory of Romania in ensuring the protection of industrial property.

The specific duties of OSIM involved in attaining the object of its activity:

- it ensures the protection of industrial property according to the special laws and international agreements where Romania is a party;
- it is the depositary of the national registers of filed patent applications and titles of protection granted to inventions, trademarks, appellations of origin, industrial designs, topographies of semiconductor products;
- it administers, preserves and develops the national patent collection, by international exchange, and generates the database in the field of industrial property;
- it edits and publishes the patent specifications;
- it edits and publishes the Official Industrial Property Bulletin with its sections on patents, trademarks, industrial designs;
- it edits and publishes, regularly, the Romanian Industrial Property Review as well as other publications designed for the promotion of the object of its activity;
- it renders specialized services in the field of industrial property, upon request;
- it examines and authorizes the industrial property attorneys;
- it lends assistance in the field of industrial property and organizes training courses, seminars and symposia on industrial property topics, upon request;
- it fulfils any other tasks deriving from the legal provisions and the international agreements where Romania is a party.

**Agenția de Stat pentru Proprietatea Intelectuală a Republicii Moldova**

**The State Agency on Intellectual Property of the Republic of Moldova**

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**State Intellectual Property Agency** (the Agency) is a public Institution subordinated to the Government, responsible for promoting and implementing activities in the field of legal protection of intellectual property.

Through AGEPI you can effectively protect your intellectual property (IP):

- Product and service of trademarks; inventions, industrial designs; geographical indications; traditional guaranteed specialties; appellations of origin; plant varieties, topographies of integrated circuits;
- Literary, artistic, scientific works, computer programs and other objects of copyright and related rights.

AGEPI issues titles of protection of IP objects, informs and provides legal consultations relating to the protection and enforcement of IP rights, publishes the Official Bulletin of Intellectual Property (BOPI) and the journal of intellectual property "Intellectus", promotes and popularizes intellectual property, organizes the attestation of patent attorneys, training and retraining courses for specialists in the field, provides IP pre-diagnosis services and other related services.

Agency's services are provided according to the Quality Management System ISO 9001: 2008, which ensures quality according to international standards.

-----  
**Agenția de Stat pentru Proprietatea Intelectuală (AGEPI)** este o instituție publică aflată în subordinea Guvernului, responsabilă de promovarea și realizarea activităților în domeniul protecției juridice a proprietății intelectuale.

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- Opere literare, artistice, științifice, programe de calculator, alte obiecte ale dreptului de autor și drepturilor conexe.

AGEPI eliberează titluri de protecție a obiectelor de PI, informează și oferă consultații juridice ce țin de protecția și realizarea drepturilor de PI, editează Buletinul Oficial de Proprietate Intelectuală (BOPI) și revista de proprietate intelectuală "Intellectus", promovează și popularizează proprietatea intelectuală, organizează atestarea mandatarilor autorizați, cursuri de instruire și perfecționare a specialiștilor în domeniu, acordă servicii de prediagnoză a PI și alte servicii aferente.

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## World Invention Intellectual Property Associations

[www.wiipa.org.tw](http://www.wiipa.org.tw)

### **INTRODUCTION:**

World Invention Intellectual Property Associations (WIIPA) is a non-profit social organization, taking the whole world as the area of organization. The memberships are foreign inventors associations, schools and related organizations. Now WIIPA has 18 member countries, like Japan, Indonesia, Malaysia, Korea, Hong Kong, Iran, Philippines, Kingdom of Saudi Arabia, Macau, Thailand, Myanmar and Vietnam in Asia; Croatia, Romania and Poland in Europe; Brazil, Canada and the United States in America.

### **PURPOSE:**

To improve the status of inventors at international levels, enhance mutual assistance and experience amongst inventors of the world, encourage creative thinking and the spirit of invention among national university hence to establish the WIIPA.



# Romanian Inventors Forum



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**Romanian Inventors Forum (FIR)** is a professional association which aims to support, stimulate the development and valorization of scientific and technical creative activities, and cultural - artistic, but also copyright problems of its members, diversification of research and technological development, design, scientific investigation, micro-production etc.

Research and development institution **certified** by the National Authority for Scientific Research (ANCS), according to HG. 551/2007, Decision ANCS no. 9708/29.07.2009.

FIR was established in 2003 by a group of university professors, elite inventors and researchers from the University Center in Iasi.

[www.afir.org.ro](http://www.afir.org.ro)



Universiti Malaysia Perlis (UniMAP) is Malaysia's 17<sup>th</sup> public institution of higher learning. It was approved by the Malaysian Cabinet on May 2001. Originally known as Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM), or Northern Malaysia University College of Engineering, it was renamed as Universiti Malaysia Perlis (UniMAP) in February 2007. The first intake consisted of 116 engineering students who started classes on June 2002. Currently, UniMAP has approximately 11,000 students and a workforce of more than 1,700 academic and non-academic staff members. It offers 21 undergraduate programs that lead to Bachelor in Engineering, one undergraduate programs that leads to an Engineering Technology degree and two undergraduate programs that lead to a Bachelor in Business. We also offer six Diploma in Engineering programs and 13 postgraduate programs that lead to the Master of Science in Engineering and PhD degrees.

## CEGeoGTech

Center of Excellence Geopolymer & Green Technology (CEGeoGTech) lead by Vice Chancellor Universiti Malaysia Perlis (UniMAP), Professor. Dr. Kamarudin Hussin. CEGeoGTech located at the School of Materials Engineering, Kompleks Pusat Pengajian Jejawi 2, Taman Muhibbah, 02600 Arau, Perlis. CEGeoGTech has been established on July 2011 with the intention to induce innovation in green material technology among researchers in Universiti Malaysia Perlis. CEGeoGTech are able combining their expertise and skills in various fields to support the academic structure in the generation of human capital that contributes to the development of high quality research. This center also can become a pillar of academic activities, especially regarding research, development and innovation. CEGeoGTech have 8 fields of research includes:

- Geopolymer
- Polymer Recycling
- Electronic Materials
- Ceramic
- Electrochemistry Materials & Metallurgy
- Environmental
- Manufacturing and Design
- Green ICT





**Malaysia Research & Innovation Society**

No. 22 & 24, Taman Kechor Indah Fasa 2, Jalan Abi Tok Hashim,  
01000 Kangar, Perlis, Malaysia

**Phone:** +604-9798885 & **Fax:** +604-9774026

**Website:** [www.myris.org.my](http://www.myris.org.my) & **Email:** [info@myris.org.my](mailto:info@myris.org.my)

The MyRIS acronym it came from “Malaysia Research & Innovation Society”.

We are solely a research & an innovation organization entity. Our goal is to create the research & an innovation environment among researchers & innovators to the high level standard thus international exposure. With various international mutual networks with several academic institutions & research & innovation entities, MyRIS able to bring up Malaysian innovation to high level standard recognition. The objectives of establishing of MyRIS are:-

1. Building research and innovation, networking between academic institutions and related societies.
2. Encouraging research and innovation activities, especially among young researchers.
3. Helping researchers in improving innovation in various aspects.

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[www.iitexpo.co.uk](http://www.iitexpo.co.uk)

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# XV

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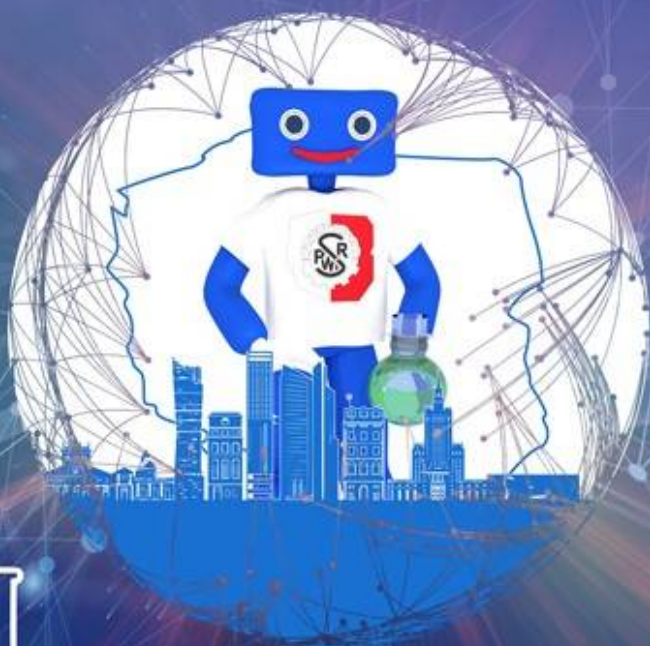
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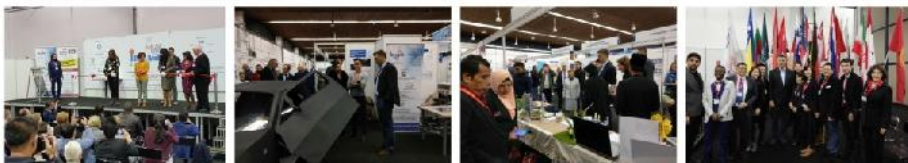


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HELD BY CROATIAN INVENTORS NETWORK AND WIIPA /WORLD INVENTION INTELLECTUAL PROPERTY ASSOCIATIONS/

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**Contact:**

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December 6~8

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- ★ A good chance to explore Southern Taiwan
- ★ A great platform to exchange ideas and views with the participants from more than 25 countries

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COMPLEXUL  
MUZEAL  
NAȚIONAL  
MOLDOVA  
IAȘI



## Palatul Culturii

Unul dintre cele mai impunătoare monumente ale României, edificiu simbol al Iașului

Complexul Muzeal Național „Moldova” Iași are sediul central în Palatul Culturii, unde se află patru muzee de talie națională:

- ▶ **Muzeul de Istorie a Moldovei;**
- ▶ **Muzeul Științei și Tehnicii „Ștefan Procopiu”;**
- ▶ **Muzeul de Artă;**
- ▶ **Muzeul Etnografic al Moldovei.**

Din cadrul Complexului face parte și

▶ **Centrul de Cercetare și Conservare-Restaurare a Patrimoniului Cultural.**

Complexul are în subordine și obiective muzeistice de pe teritoriul orașului Iași și, respectiv, al județului. Acestea sunt:

- ▶ **Muzeul Memorial „Mihail Kogălniceanu” Iași;**
- ▶ **Muzeul Unirii Iași;**
- ▶ **Muzeul „Poni-Cernătescu” Iași;**
- ▶ **Palatul Memorial „A.I. Cuza” Ruginoasa;**
- ▶ **Muzeul Arheologic de sit din Cucuteni;**
- ▶ **Muzeul Viei și Vinului din Hârlău.**

Palatul Culturii a făcut subiectul unui amplu proces de restaurare, finalizat în ianuarie 2016, desfășurat în cadrul Programului Guvernamental de reabilitare a monumentelor istorice.

În data de 27 aprilie 2016, Palatul Culturii a fost redeschis publicului larg, cele patru muzee care își au sediul aici inaugurând fiecare expoziții temporare ce pun în valoare doar o parte din colecțiile muzeale.

OBȚINEREA ȘI EXPERTIZAREA UNOR NOI MATERIALE BIOCUMPATIBILE  
PENTRU APLICAȚII MEDICALE

OBTAINING AND EXPERTISE OF NEW BIOCUMPATIBILE MATERIALS  
FOR MEDICAL APPLICATIONS

# Medical Met Mat

60 PCCDI / 2018

PN-III-P1-1.2-PCCDI-2017-0239

Valoare Proiect Complex: 5.273.400 RON

PROIECTE COMPONENTE:

**ORTOMAG**

*Coordonator - TUIASI*  
*Prof. Univ. Dr. Ing.*  
*Corneliu MUNTEANU*

**BioTIT**

*Coordonator - TUIASI*  
*Prof. Univ. Dr. Ing.*  
*Petrică VIZUREANU*

**BIODENTRUT**

*Coordonator - UPB*  
*Prof. Univ. Dr. Ing.*  
*Iulian Vasile ANTONIAC*

**HEAMED**

*Coordonator - UPB*  
*Prof. Univ. Dr. Ing. Victoras GEANTĂ*

**SOLION**

*Coordonator - TUIASI*  
*Conf. Univ. Dr. Ing. Ioan Gabriel SANDU*

PARTENERI:

- Universitatea Tehnică "Gheorghe Asachi" Iași - Prof. Univ. Dr. Ing. Corneliu MUNTEANU
- Universitatea Politehnica București - Prof. Univ. Dr. Ing. Iulian Vasile ANTONIAC
- Universitatea de Medicină și Farmacie "Grigore T. Popa" din Iași - Prof. Univ. Dr. Norina Consuela FORNA
- Universitatea de Științe Agricole și Medicină Veterinară „Ion Ionescu de la Brad” din Iași  
- Prof. Univ. Dr. Gheorghe SOLCAN
- Universitatea „Alexandru Ioan Cuza” din Iași - Prof. Univ. Dr. Ion SANDU
- Universitatea „Dunărea de Jos” din Galați - Prof. Univ. Dr. Kamel EARAR
- Universitatea de Medicină și Farmacie din Târgu Mureș - Conf. Univ. Dr. Kelemen HAJNAL
- Institutul Național de Cercetare Dezvoltare in Optoelectronica - Dr. Ing. Alina VLĂDESCU
- Institutul Național de Cercetare-Dezvoltare pentru Fizică Tehnică - IFT Iași - CSII Dr. Adriana SAVIN
- Institutul Național de Cercetare-Dezvoltare pentru Inginerie Electrică - Dr. Ing. Mirela CODESCU

OBȚINEREA ȘI EXPERTIZAREA UNOR NOI MATERIALE BIOCOMPATIBILE  
PENTRU APLICAȚII MEDICALE

OBTAINING AND EXPERTISE OF NEW BIOCOMPATIBLE MATERIALS  
FOR MEDICAL APPLICATIONS

# Medical Met Mat

60 PCCDI / 2018

PN-III-P1-1.2-PCCDI-2017-0239

Valoare Proiect Complex: 5.273.400 RON

## OBIECTIVE SPECIFICE:

- Proiectarea, realizarea și testarea diferitelor tipuri de materiale biocompatibile și îmbunătățirea acestora.
- Angajarea a 14 tineri cercetători pe posturi vacante cu normă întreagă conform contractului de finanțare, 10 aparținând partenerilor universitari (TUIASI, UP BUCUREȘTI, USAMV IAȘI) și 4 aparținând INCD-urilor (IFT IAȘI, INOE 2000 BUCUREȘTI).
- Utilizarea în mod echilibrat a cheltuielilor de întărire a capacității instituționale (cec-uri), atât pentru servicii de cercetare oferite între parteneri, cât și pentru mobilități și stagii de pregătire, în scopul perfecționării în înțelegerea de noi tehnici și tehnologii specifice proiectului.
- Asigurarea dezvoltării competențelor de ordin practic în realizarea și testarea de noi materiale biocompatibile cu utilizări în domeniul medical, prin identificarea unor compoziții optime ce vor fi brevetate și diseminate către mediul de afaceri interesat.
- Asigurarea transferului tehnologic a rezultatelor obținute în cadrul Proiectului Complex la nivel regional și național.

## REZULTATE:

- Noi tipuri de biomateriale cu utilizări medicale diferite:
  - biomateriale biodegradabile cu utilizări în ortopedie;
  - biomateriale pe bază de titan pentru protetică medicală;
  - biomateriale cu aplicații stomatologice;
  - biomateriale cu entropie ridicată.
- Îmbunătățirea biocompatibilității acestor tipuri biomateriale prin acoperiri și sisteme de aerosoli.
- În realizarea activităților fiecărui proiect component sunt prevăzute livrabile obligatorii ce constau în lucrări științifice publicate în reviste ISI/BDI, cereri de brevete de invenții, participări la conferințe naționale și internaționale, respectiv workshop-uri de prezentare periodică a rezultatelor Proiectului Complex, cu participarea reprezentanților tuturor partenerilor, centrelor medicale locale și naționale, cât și a reprezentanților mediului de afaceri, producători și beneficiari de biomateriale, din țară și străinătate.

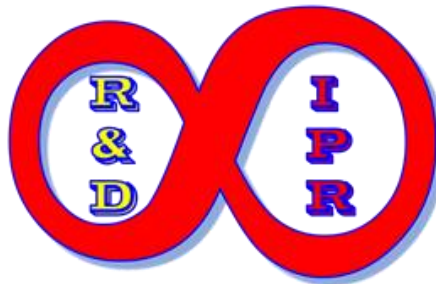


## **RESEARCH & DEVELOPEMENT / INTELLECTUAL PROPERTY RIGHT IN THE RESEARCH PROJECTS**

**Popovici Ernest**

### **NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLPR**

In our research projects, we apply the infinite cycle: the intellectual property right created and applied in ongoing research projects which in turn generates intellectual property rights. This cycle is even a measure of the effectiveness of development research activity. We present and analyze in this report a recent case, the PRELAM project - New advanced surface coating technologies using the high power laser beam to increase the reliability of materials performance, in frame of the competitiveness operational programme. PRELAM project addressing a process linking development / research and the economic environment through partnerships for knowledge / technology transfer. One of the ways of transfer is collaborative research between a research institute and a company. The field is the material domain, namely eco-nano-technologies and advanced materials. The aim is to promote and develop links and synergies between enterprises, research and development centers targeting early validation of manufactured products, advanced production capacities, generic technologies for general use. This analysis has as its object the subsidiary contract between the two entities mentioned.



**E-mail: [popovicio5@yahoo.co.uk](mailto:popovicio5@yahoo.co.uk) Web: [www.inflpr.ro](http://www.inflpr.ro)**

## Invited Speaker

### Anca Daniela RAICIU, PhD.Pharm.

Marketing, Sales, Logistics & Distribution  
Director HOFIGAL  
S.C. HOFIGAL EXPORT-IMPORT S.A.

marketing@hofigal.eu



Ms. Chim. Anca Daniela Raiciu is a Marketing, Sales, Logistics & Distribution Director at HOFIGAL since 2007. She is also Ph.D. in Pharmaceutical Sciences, Vice President of the Romanian Society of Chemists Cosmetology Chemists, lecturer at "TITU MAIORESCU" Pharmacy. He has proudly been HOFIGAL since 2002 and has been actively involved in the creation of new products and their promotion on the domestic and foreign markets. She also has a vast experience in the pharmaceutical and cosmetic industry since 1988, and she pass through all stages of research and production.

"The fact that nothing is more important in life than health is an old wisdom, the truth of which we convince the passing day. What we need to do to acquire and maintain this precious health is a question that has marked my meaning and course of life. That led me to use my time and energy in-depth studies of chemistry, biochemistry and pharmacy and led me to get my doctorate in an increasingly interdisciplinary field."

**Knowing in detail how one substance interacts with one another and its effects on health, that would be my personal definition of pharmaceutical science, which I have the honor of serving with the same love for ever.**

In 2019, HOFIGAL celebrates 29 years of activity and I am proud to say that at this moment it is the only company of complementary natural products for health with integral Romanian capital, employing over 400 employees and holding hundreds of products : cosmetics, oils, teas, gemoderivates, tinctures, capsules and tablets, as well as a natural therapy complex at Breaza and some pharmacies.

In my profession, I succeeded in supporting the achievement of the goal of growing plants under advanced greening conditions, at certified quality standards by the most prestigious and severe international bodies.

I am the owner of more than 10 patents and the leading products from them are internationally awarded and have generated the amazement and respect of other industry specialists at European or world level.

There are products that Romanian consumers have taken as non-invasive and effective allies in preventing diseases of any kind and in gaining vitality and energy without which life, with its many responsibilities, would seem like a chore.

Dr. Anca Daniela RAICIU



"ȘTEFAN PROCOPIU" SCIENCE AND  
TECHNIQUE MUSEUM

## "His Master's Voice"

The project "His Master's Voice" brings a less conventional contemporary-arts perspective to the people involved in the scientific event EUROINVENT 2019 (particularly, the creativity and innovation exhibition). It consists in a sound site-specific intervention composed of some very short musical interludes, which

originate from a very precious old musical instruments local collection.

The acoustic ambiental space of the creativity and innovation exhibition is periodically claimed and filled in by short fragments, specific to a revoluted historical age of music. They were previously recorded from vintage exhibits belonging to the 'Mechanical music instruments' collection of "Ștefan Procopiu" Science and Technique Museum (part of "Moldova" National Museum Complex, Palace of Culture, the venue of the scientific event EUROINVENT 2019).

The sound site-specific installation, acting as a quasi-immaterial complement of the scientific exhibition, is expected to induce some kind of sensorial and mental synchronisation within the public swarming along the many exhibition booths. The broadcasted vintage sound calls for everybody's attention and, for some moments, is entrusted to impose a perceptual acoustic space, which generates a 'shared mental space'. The people involved in the exhibition are in this way encouraged to meditate about the historical becoming of concepts such as 'old' vs. 'new', 'technical evolution' in conjunction with 'artistic expressiveness', 'creativity' both in science and the arts.

The author of the contemporary-arts sound project is Professor Florin GRIGORAȘ, PhD ("G. Enescu" National Arts University from Iași, Visual Arts and Design Faculty). He teaches information technology, artistic communication and creativity in the Foto-Video department.

Curator: eng. Monica NĂNESCU, PhD, Head of "Ștefan Procopiu" Science and Technique Museum ("Moldova" National Museum Complex from Iași).



"His Master's Voice" is a reg. trademark of RCA



"ȘTEFAN PROCOPIU" SCIENCE AND  
TECHNIQUE MUSEUM

## "His Master's Voice"

Proiectul propune participanților la evenimentul științific EUROINVENT 2019 o intervenție sonoră de tip *site-specific*, care punctează durata zilei prin scurte interludii muzicale care au ca sursă o colecție inestimabilă de instrumente muzicale vechi, aflată în instituția ce găzduiește evenimentul.

La intervale regulate, spațiul sonor al expoziției de inventică este inundat de muzică din altă epocă, provenind de la exponatele din colecția 'Instrumente de muzică mecanică' aparținând Muzeului Științei și Tehnicii "Ștefan Procopiu" din Complexul Muzeal Național "Moldova" Iași.

Intervenția sonoră realizează o comuniune, o stare de coerență în public, prin depășirea divizării specifice (în pavilioane) necesară organizării expoziției, determină o solicitare generalizată a atenției, structurând agitația vizitatorilor printr-un spațiu mental acustic colectiv. Evenimentul cu profil artistic urmărește să marcheze, de-a lungul derulării manifestărilor științifice, momente în care participanții sunt invitați să mediteze la istoricul, devenirea și importanța ideilor de 'noutate', 'inventivitate' și 'creativitate' pentru evoluția societății.

Fundalul acestei meditații induse prin intervenție sonoră este alcătuit din fragmente muzicale, celebre sau având particularități de neconfundat, provenind de la începuturile înregistrărilor muzicale sau ale producției mecanice de muzică instrumentală.

Autorul proiectului "His Master's Voice" este Dr. Florin GRIGORAȘ (Universitatea Națională de Arte "George Enescu" din Iași), profesor universitar în cadrul Facultății de Arte Vizuale și Design a UNAGE, titularul cursurilor de tehnologia informației, comunicare și creativitate artistică în cadrul departamentului Foto – Video.

Curator: Dr ing Monica NĂNESCU,  
Șef Muzeu, Muzeul Științei și Tehnicii  
"Ștefan Procopiu" - Complexul Muzeal  
Național "Moldova" Iași.



"His Master's Voice" este o marca înregistrată a RCA

# INTERNATIONAL EXHIBITORS

Bosnia and Herzegovina, Bulgaria, Cambodia, Canada,  
China, Croatia, Germany, Egypt, Hong Kong, India,  
Indonesia, Iran, Iraq, Italy, Japan, Kazakhstan, Kyrgyzstan,  
Korea, Lebanon, Macao, Macedonia, Malaysia, Mexico,  
Morocco, Moldova, Philippines, Poland, Portugal, Russia,  
Saudi Arabia, Singapore, Spain, Sudan, Taiwan, Thailand,  
Turkey, Ukraine, United States of America, United Kingdom,  
Vietnam, Yemen

## Bosnia and Herzegovina

### BH.1.

**Title**

**ROVER**

**Authors**

**Harun Kovacevic, Bakir Kapetanovic, Haris Dzananovic**  
**Menthor: Admir Aksamovic**

**Institution**

**Srednja elektrotehnicka skola Sarajevo**

**Patent no.**

Patent application

**Description**

A robot with an innovative mechanism that ensures it is smooth movement and overturning. It can serve as a military vehicle for various experiments but also in other activities depending on needs.

**Class**

8



## Bulgaria

*University of Chemical Technology and Metallurgy, Sofia, Bulgaria*

### BG.1.

#### Title

**Development of analytical protocol for estimation of current state of contaminated mining spots by ICP-OES**

#### Authors

Darya Ilieva, Lyudmila Angelova, Andriana Surleva

#### Institution

**University of Chemical Technology and Metallurgy**

#### Description

The mining industry has resulted in enormous quantity of generated waste. The efforts to remediate the contaminated spots finished very often with some partial results. In order to monitor the current state of tailing dumps and ponds, sensitive and reliable analytical protocols are needed. Usually the total heavy metal and metalloids content is determined. However, the recent studies have showed that the bioavailability and environmental fate of contaminants determined their toxicity and environmental impact. Studies on heavy metal absorption in different soil fractions and bioindicators allowed estimating the current state of contaminated areas. Although the intensive research in this direction, no universal approach available. The applied method for analysis should be optimized and validated in each laboratory taking into account the specificity of the analytes and the matrix. The ICP-OES allows multicomponent analysis with high sensitivity for the most environmental applications. ICP-OES offers a good range of interference free wavelengths for heavy metals and metalloids determination; however the determination of traces in complex matrix could be challenging issue. Another crucial point is the sample preparation step, which should account for sample matrix and be compatible with the detection technics. The aim of this project is to develop a protocol for estimation of the state of mining spots by multicomponent ICP-OES analysis of samples from tailing ponds and dumps, surrounding environment, as well as bioindicators. The developed protocol should be validated according to the current environmental regulations and provide data about bioavailability and bioaccumulation of heavy metals and metalloids. The obtained data should be used as a tool for environmental monitoring.

*University of Forestry – Sofia*

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**BG.2.**

<b>Title</b>	<b>Assessment of ecosystem restoration in reclaimed terrains damaged by copper mining</b>
<b>Authors</b>	Veneta Stefanova, Petar Petrov
<b>Institution</b>	<b>University of Forestry - Sofia</b> The research aims to appreciate the restoration of ecosystems in reclaimed terrains damaged by copper mining in Bulgaria. One of the most important preconditions of ecosystem rehabilitation in post mining landscapes is the soil formation process. In this context, the soil samples from Ellatzite copper mine are analyzed according to key parameters – the content of heavy metals, alkali and alkaline earth metals, nitrogen, phosphorus and organic matter. The results of the study show that there are soil formation processes in reclaimed terrains whose speed and qualities depend on the soil-forming materials and the type of vegetation.
<b>Description</b>	
<b>Class</b>	Innovative research



**BG.3.**

<b>Title</b>	<b>Voltamperometric and spectral characterization of new n-phthalimide dyes and their application for metal determination</b>
<b>Authors</b>	Artem Bezfamilnyi, Stela Georgieva
<b>Institution</b>	<b>University of Chemical Technology and Metallurgy-Sofia</b>
<b>Description</b>	Transition metals such as copper, cobalt and nickel are very significant for both industrial production and several biological processes such as aerobic oxidation, electron transfer, protein metabolism, cell growth, hemoglobin synthesis, etc. Despite these indispensable role, hyper dosage, mutual imbalance or chronic exposure of these metals is generally considered toxic and can affect and threaten the health of human being owing to their accumulation and persistence for example in the compartments of the food chain. In this regards new photochromic N-phthalimide dyes have been tested for chemosensor activity towards Cu(II), Ni(II), Pb(II) and Co(II) ions by determination of metal sensing abilities explored on absorbance and electrochemically. The voltamperometric (differential pulse and cyclic voltamperometry with HMDE working electrode) and Uv-Vis properties of dyes and their complexes have been carefully investigated with different aspects of sensing behavior such as sensitivity, binding constant, stoichiometry and pH range. The results revealed that the sensors provided electrochemical and spectrochemical sensing excellent response with low limit of detection.

Acknowledgments: Financial support from BG05M20P001-2.009-0015 “Support for the development of capacity of doctoral students and young researcher in the field of engineering, natural and mathematical sciences” funded by the operational programme “Science and Education for Smart Growth” 2014–2020 the co-financed by the European Union through the European Social Fund is gratefully acknowledged.

**BG.4.****Title**

**Energy Saving of The Heat Transfer Processes in the Reheating Furnaces**

**Authors**

Mariya Ivanova, Emil Mihailov

**Institution**

**University of Chemical Technology and Metallurgy, Bulgaria**

**Description**

For the successful application of the "hot-charge" method it is necessary to establish quantitative relationships between the temperature of the charged metal, the rolling rate, average performance, fuel consumption and the amount of pellet. In order to achieve this goal, a mathematical model of metal heating for the determination of the temperature regimes is created depending on: the location of the individual blocks in the working space, their temperature, the chemical composition of the metal, the dimensions and the time they have to leave the furnace.

The implementation of the "hot-charge" method involves both technological and organizational events, the most important of which is the complete synchronization of processes and the quality of the cast units. This is inevitably linked to additional investments. Therefore, prior to selecting the particular conversion option, an initial assessment of the possible energy savings of the various pre-reheating load variants has to be made.

Acknowledgments: Financial support from BG05M20P001-2.009-0015 "Support for the development of capacity of doctoral students and young researcher in the field of engineering, natural and mathematical sciences" funded by the operational programme "Science and Education for Smart Growth" 2014–2020 the co-financed by the European Union through the European Social Fund is gratefully acknowledged.

**BG.5.****Title****Stress investigation in Ge-Te-In thin films****Authors**

Vladislava Ivanova, Yordanka Trifonova

**Institution****University of Chemical Technology and Metallurgy****Description**

The structure and properties of amorphous or glassy alloys have been the subject of extensive studies for several years. The semiconducting chalcogenide glasses are interesting members of the family of disordered solids. They are important due to their remarkable properties, which make them useful in optoelectronics for infrared elements and devices for acousto-optic devices, as optical waveguides, infrared optical fibers, solar cells and thermal imaging detectors, for electrical switches, holography and information storage media, as chemical sensors, bio-sensors and optical recording systems. The present research reports for the first time the effect of In addition on some mechanical characteristics of Ge-Te matrix, such as stress and stress relaxation. Thin amorphous chalcogenide films from the  $(\text{GeTe}_3)_{100-x}\text{In}_x$  and  $(\text{GeTe}_4)_{100-x}\text{In}_x$  systems have been prepared by thermal evaporation and characterized with respect to their internal stress using a cantilever technique. The correlations between the stress, the composition and the structure of the films were investigated. The obtained results were related with some structural and mechanical parameters of the glasses like mean coordination number, number of constraints per atom, density, compactness, micro hardness and Young's modulus. For all investigated chalcogenide films, a stress relaxation with the time was observed as a result of spontaneous structural rearrangements.

Acknowledgments: Financial support from BG05M20P001-2.009-0015 "Support for the development of capacity of doctoral students and young researcher in the field of engineering, natural and mathematical sciences" funded by the operational programme "Science and Education for Smart Growth" 2014–2020 the co-financed by the European Union through the European Social Fund is gratefully acknowledged.

**BG.6.****Title****SYNTHESIS AND CHARACTERIZATION OF NEW HEMORPHIN-7 ANALOGUES****Authors**

Petia Peneva, Petar Todorov

**Institution****University of Chemical Technology and Metallurgy, Sofia, Bulgaria****Description**

Hemorphin-7 is a naturally occurring, endogenous opioid peptide of the Hemorphin family with affinity for opioid receptors and morphinomimetic properties. Hemorphin-7 is short-chain peptide initially obtained from a particular region of the  $\beta$ -chain of hemoglobin. Both N- and C-terminal extensions of this peptide have been isolated from human and bovine tissues (human 32-41 fragment and bovine haemoglobin fragment 31-40). Hemorphins are largely distributed in the organism. The haemoglobin-derived peptides are increasingly being used in the treatment of various diseases such as hypertension, epilepsy, diabetes, chronic pain, cancer, and etc. This report refers to the synthesis of new hemorphin-7 analogues containing unnatural amino acids. The novel haemoglobin-derived peptides have been prepared by replacement of Gln at position 3 and Pro at position 6 with unnatural amino acids (Val-Val-Tyr-Yyy-Trp-Thr-Xxx-Arg-Phe) using solid phase peptide synthesis (SPPS)-Fmoc (9-fluorenylmethoxy-carbonyl) chemistry. The crude peptides were purified on an RP-HPLC and the molecular weights were determined, using ES-MS, and also determining of the specific angles of optical rotation. Structure-activity study will be discussed after investigations of the biological activity of newly synthesized Hemorphin-7 analogues.

Acknowledgments: Financial support from BG05M20P001-2.009-0015 "Support for the development of capacity of doctoral students and young researcher in the field of engineering, natural and mathematical sciences" funded by the operational programme "Science and Education for Smart Growth" 2014–2020 the co-financed by the EU through the European Social Fund is gratefully acknowledged.

**BG.7.**

**Title** **Direct Analysis of the Membrane Structure by Numerical Simulation**

**Authors** Dessislava Moutafchieva, Veselin Iliev

**Institution** **University of Chemical Technology and Metallurgy, Sofia, Bulgaria**

**Description** The objective of this work is numerical simulation of the membrane by direct analysis at micro, meso and macro level. This approach includes first a defining and modeling of a basic structural unit, after that simulation of a fragment as a representative element of the membrane structure. Then the results obtained to transfer for the entire membrane module and finally modeling of the membrane as porous media with calculated permeability. The numerical simulation was done with Ansys CFX, using the Darcy's equation for flow through porous media with configuration of the membrane and second order backward Euler transient scheme for solving the Navier-Stokes equations.

The permeability of the membrane is determined at a micro and macro level by computer simulation for different fluids, which allows to evaluating the influence of the viscosity on the flow passing through the membrane. This micro-macro approach is quite efficient and cost-effective because it saves time and requires less computer capacity and allows direct analysis of the complex structure of the membrane modules.

Acknowledgements: Operational Program "Science and education for smart growth" 2014-2020 of the European Union cofounded by the European Social Fund through the project BG05M2OP001-2.009-0015 and project ДФНИ-ДН 07/11 NSF of Bulgaria are gratefully acknowledged.

**BG.8.**

**Title** **Numerical Simulation of the Delamination in Load-bearing Structures, Composed by Glued Parts**

**Authors** Zlatka Geshkova

**Institution** **University of Chemical Technology and Metallurgy, Sofia, Bulgaria**

**Description** Delamination is a form of partial damage to the load-bearing structures made up of glued parts. This often leads to a rupture, resulting development of the defects and complete

destruction. The object of the present study is a process of delamination in a structure of three glued parts forming a two-hole angular bracket. The bracket is bolted in one hole and is loaded by distributed load in the other. The purpose of the work is to determine the difference in stress-strain condition of the three parts in absolute tight bonding and in gluing with real adhesive. Solution was carried out with Ansys Inter202 finite element, which has a zero initial thickness, and declares a cohesive zone model. The results of the study allow to be drawn on the relationship between the overall load-bearing capacity of the bonded structure and the quality of the bond.

Acknowledgements: Operational Program "Science and education for smart growth" 2014-2020 of the European Union cofounded by the European Social Fund through the project BG05M2OP001-2.009-0015 and NIS-UCTM Sofia are gratefully acknowledged.

# Cambodia

*Norton University*

## KH.1.

### Title

**Experimental Boiling System for Secondary School**

### Authors

CHAN Mithona (Advisor), HACH Phanong, MAY Pisal

### Institution

Norton University

Education of science is very important for living condition and country's development. But in Cambodia nowadays, there are many schools that have been providing only theory and they did not practice on Experiment. Moreover, some schools are lacking of experiment tool to experiment .These factors have affected student learning.

So, my team created a new project that related to one unit of physic in grade seven of Heat Energy which formula “ $Q=mc\Delta T$ ”.

The project name is "Experimental Boiling System for Secondary School. That is used to monitor data of Heat Energy, Temperature, and Time of boiling.

### Description

This project require user input some data such as, Temperature of Heat resistor by twist Variable Resistor ,and Mass of water by Keypad then enter to choose them to calculate with temperature of water that detect by temperature sensor the end push button start to calculate and we use Arduino Nano as a controller . All data above display on LCD.When the water is boil Buzzer Module will release voice then you can push button stop.

Goal of Project

- To help teacher and students to do experiment by donation
- Easy to install and use
- Verify theory with experiment
- To help the students understand clearly about this lesson than before
- Low price

### Class

5. Industrial and Laboratory equipment.



**KH.2.**

**Title**

**Forest burning and Flooding monitoring**

**Authors**

CHAN Mithona(Advisor), UL Dara(Advisor), DAN Chantara , SRUN Muoykieng

**Institution**

**Norton University**

**Description**

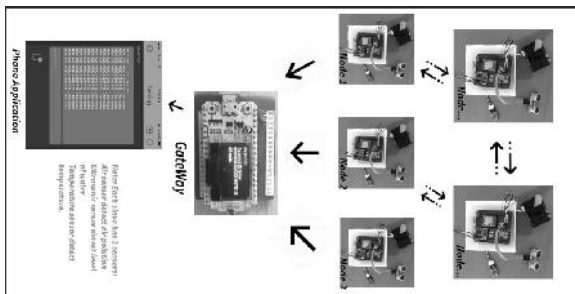
Nowadays the variety of season and weather can make the increase of heating and raining that we cannot be expectation. Because of this can establish the Natural disaster such as forest burning and flooding. So my team will create the project that call Forest burning and Flooding Monitoring which is easy to know and predict data.

The process of this project we have a lot of Node and it will control three sensors like pm2.5sensor to detect air pollution, temperature sensor to detect temperature in the forest, ultrasonic sensor to detect level water. We apply all Node in forest and river to collect data and each node will communication with each other by lora module after it send data to gateway then it will send to blynk app and control center. Control center can predict data for emergency condition that receive from nodes. If data has emergency, the blynk app will post a notification on phone and Control center will show this data by television or post to police station.

Especially the advantages of this project are help people for moving on time, decrease for losing the forest, rescue people and animals, specific data using Lora communication within 10km free space, using solar hybrid system, fast information.

**Class**

1. Environment- Pollution Control





**KH.3.**

**Title**

**Smart Emergency Finding Lost System**

**Authors**

Mr. CHAN Mithona(Advisor), Mr. SA Sokkry, Miss. POLY Pheary, Mr. SUOM Seyla

**Institution**

**Norton University**

**Description**

This system uses for notification and find location without using cellular system or internet connection. We propose this system because we noticed that in Cambodia cultural resources are almost located in rural area where difficult to install cellular system or internet connection, which it may hard to communication. This system will help the tourists get lost and need helper to find their location. In this system we have sub-controller (User ID), antennas, main controller, and control center, where we use Arduino Pro mini and IC 328p (Atmel chip) as microcontroller to manage the system by coding. And we use module GPS to detect the location of user, then module HC-12 is the wireless module which we use to carry the data (location of user) pass throw any antenna toward main controller and control center. In sub-controller wear IC 328p, module GPS, and module wireless HC-12. In antenna and main controller are wear Arduino Pro mini and module wireless HC-12, and for Control Center wear Arduino Chip and module wireless HC-12 and PC App for show offline map. Moreover, for antennas we use Solar Hybrid System for saving energy.

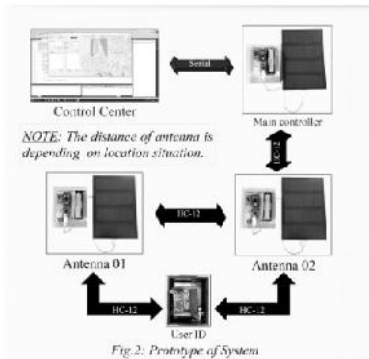
For the processing of system there are 2 kinds

- User push button on sub-controller to notification to control center for need help.
- Control center request location of user by input user ID in PC App.

Note: this system non-tracking location of user.

**Class**

12. Safety, protection and rescue of people



## Canada

by

*Toronto International Society of Innovation & Advanced Skills (TISIAS)*

### CA.1.

**Title** DO IT YOURSELF EAVES TROUGH CLEANER

**Authors** Otto Schmidt

**Institution** Accent on Skills Consulting

**Patent no.** N/A

**Description**

This particular eaves trough can extend its reach by 200% compared to the normal existing troughs available in the market. Thus it reduces time and work involved in the task. The users can perform cleaning without dirtying their hands and clothes while reducing danger elements around the environment. This innovation only requires a few parts to manufacture and so it is economically effective.

**Class**

5



### CA.2.

**Title** Lily Rice Germ

**Authors** Nut Prabpanja

**Institution** Community Enterprise Group, Rice Innovation Genuinely Rice Germ

**Patent no.** N/A

**Description**

This is a useful nutritional rice pattern. The group brought rice planting, organic forms, which are 3 strains include rice Berry relaunch droplet. Hom (SOI.watdawrang) focus on processing the product as a germ by each production to be sawn is the germ of rice must be used all 3 species, all of the approximately 1,000 kg% as follows: Rice, rice Berry 30 percent, to relaunch droplet rice. 30 percent and 40 percent (SOI.watdawrang) rice after all goes through a color out of the shell is still the rice Brown rice and bring it through the rehearsal, or color. Scrubbing again. The colors or polished twice to make the tip of the nose rice falling out came rice, broken parts? Then need to sift and filter it will have

## EUROINVENT 2019

approximately 9 kilograms of pure rice germ, representing 0.9 percent of the total number of 1,000 kg of rice dumplings, roasted by heating temperature control using heat-sensitive (cold light) because the germ has oil in it must be a very mild heat. Roasted, cooked rice, popcorn-like aroma, bring offers cool, then gradually bring packed in containers. In the current static Organization produced handmade every step so that consumers can experience. As: the original without using tools. Rice germ oil, ginseng tea has antioxidants, reduces cholesterol in the blood vessels help excretory system better. Preventing colon cancer, reduce symptoms of distal synapses by tea.

**Class**

3



### CA.3.

**Title**

**Frame Wood House Firefighting System**

**Authors**

BEHROUZ RAHIMI

**Institution**

NU INNOVATIONS INC.

**Patent no.**

N/A

**Description**

Nu Innovations Inc. with the back ground of research, innovate and developing new firefighting system for high rises, tunnels and ships fill the lack of new solution for these challenges in last years. Now here is presenting new mechanism for fire on wooden houses that has following characters: It could be used for existing and new building It is distinguishing fire from outside and inside of the building Extensive boundary cooling is performing for not infiltration fire to neighbor sit's an independent mechanism which use Urban water plumbing ether could connect to the outlet water of firefighting trucks.

**Class**

12



INTERNATIONAL EXHIBITS

## China

**CN.1.**

**Title** A Device for Electricity Collecting by Solar Energy  
**Authors** QI, MINGLU  
**Institution** Chongqing No.11 Middle School

**Description** This is a device for electricity collecting by solar energy. It includes a distributed solar energy collector and a photoelectric conversion unit. The distributed solar energy collector has at least one solar panel and this panel connects the power display by electric wire and through the power display, the electricity which collected by the solar energy collector can be shown directly. Furthermore, the measurable value of the electricity from the distributed solar energy collector can transfer to the data collection center via the long distance wireless transmission module to monitor the condition of the energy collection.

**Class** 2.Energy and sustainable development



# Croatia

Represented by  
**CROATIAN INVENTORS NETWORK**

**HR.1.**

**Title** C@N Motion Smart Customer/Human Engagement  
**Authors** TOMISLAV BRONZIN  
**Institution** CITUS d.o.o.  
**Patent no.** HR-PK20150706

**Description**

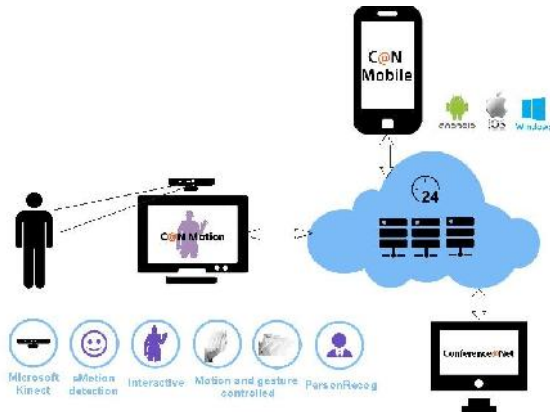
C@N Motion Smart Customer/Human Engagement is digital platform which enables innovative human-computer-human (HCH) interaction through natural user interface that uses gesture/voice commands instead of keyboard/mouse. Advanced algorithms detect user gender, age and sentiment to enable new channel of communication. Solution is applicable to wide range of industries: marketing, retail, ticketing, healthcare, education, etc.

**Advantage:**

Advantage of this innovation is its ability to detect user gender, age and sentiment in real time, without usage of large database of photos/images. It does not take photo of the person/s in front of the system, so it provides complete privacy, identity protection and private data security.

**Class**

10



**HR.2.****Title****CAN-capsule-3D printed capsule for controlled drug release****Authors****GORDANA MATIJASIC, MATIJA GRE TIC, ANNA POROPAT, JOSIP VINCIC****Institution****Fakultet kemijskog inženjerstva i tehnologije Sveucilista u Zagrebu****Patent no.**

Patent application

**Description**

The CAN-capsule is a capsule model designed for controlled release of the active pharmaceutical ingredient (API). The capsule is printed using fused deposition modelling 3D printer. Poly(vinyl alcohol), biodegradable and pharmaceutically acceptable polymer, is used. The CAN-capsule consists of base and cap (Attachment 1). The assembled capsule is cylindrically shaped, with a length of 21 mm and diameter 9.4 mm. Design of the model is very complex, consisting of an inner and outer compartment in which API is filled. The cross-section of the capsule body and cap, as well as dimensions, is shown in Attachment. The API is first released through the outer compartment (capsule body). When the content of the outer compartment is released, the inner compartment (inner body) begins to dissolve and releases the remaining content. The CAN-capsule enables combined delivery of two active ingredients as well as delayed and prolonged drug release.

**Class**

11



**HR.3.**

**Title** **Intelligent clothing for patients with apnea and snoring**  
**Authors** **Daniel Casar Velican, Dubravko Rogale, Snjezana First Rogale, Sinisa Fajt, Zeljko knezic**  
**Institution** **Tekstilno-tehnoloski fakultet Sveuciliste u Zagrebu**  
**Patent no.** Patent application

**Description**

An intelligent garment for the sufferers of the apnea is carried on the body of a person who is sensory control over sleep. During the sound disturbance, sound is generated by the sound sensor. At the same time, the vibration of the chest is detected by the muscle activity sensor. Likewise, changing the position of the bedroom using the accelerator sensor is recorded using a cell phone. The microcomputer system with its peripheral and appropriate sensor and software package are integrated into the clothing.

The advantage of an intelligent clothing item for apnea detection is currently alerting the user about his dream (awakening from sleep) or sleep assessment (sleep map). Clothing is designed for monitoring of snoring.

Advantage:

It is possible to analyze the data in real time and subsequently, after the interruption of use (medical analysis).

**Class**

9

**HR.4.**

**Title** **The universal sample holder**  
**Authors** **Vilko Mandic, Stanislav Kurajica**  
**Institution** **Fakultet kemijskog inzenjerstva i tehnologije Sveucilista u Zagrebu**  
**Patent no.** Patent application

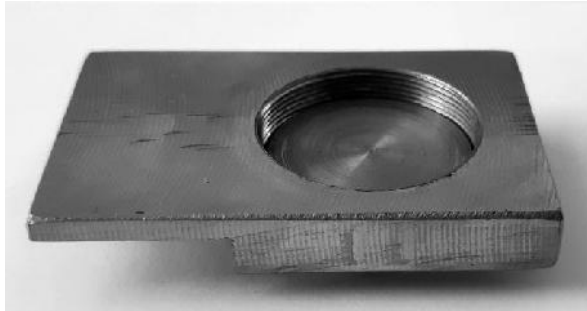
**Description**

In instrumental analysis, for example X-ray diffraction analysis, the geometry of the sample is of utmost importance, i.e. that the side of sample exposed to irradiation be as flat as possible and specimen aligned with the edges of sample holder. Ensuring of such alignment is demanding when the specimen is non-powder such as metal strips, electrodes,

substrates, etc. The universal sample holder is intended for solving the described problem. It has movable bottom so the height of the specimen compartment could be adjusted according to size and shape of the specimen. The position of the bottom is regulated by a thread, the sample carrier could be loaded on both sides, the specimen could be fixed to the sample holder and aligned with its edges. Thereby, multiple functionalities are enabled: 1) a standard measurement functionality for conventional powder sample analysis, 2) improved functionality in terms of reducing the influence of the preferred orientation of the powders that are prone to it. In addition, 3) functionality of the analysis of non-powder samples of irregular shapes that should have only one flat surface. A simple and reliable sample construction of the universal sample holder enables reliable and reproducible analysis of different type of samples.

Class

5



**HR.5.**

**Title** Gasification of waste sludge  
**Authors** Vjekoslav Majetic  
**Institution** DOK-ING d.o.o.  
**Patent no.** EUTM 008132409

**Description** Problem:  
 • The way in which the unprocessed waste is deposited on the depargalist without prior treatment has become unacceptable, ecological and economical.

How to solve it:  
 • The newer approach to the treatment of waste in a completely ecological and economically acceptable way is



the use of gasification technology

Device description:

Gasification plant

- The device is intended for safe and economic processing of all types of waste materials and electrical energy production

- It consists of:

- 1) Unit for waste sludge processing
- 2) Electrical energy production units

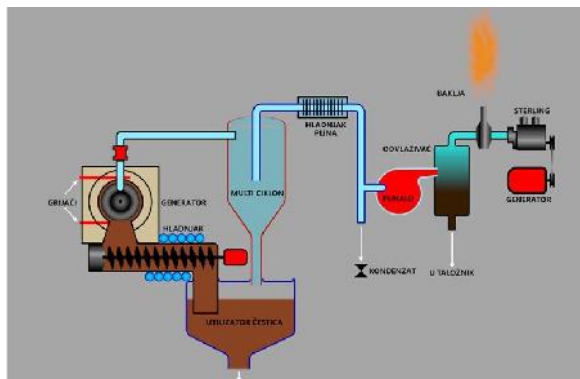
- Production materials ensure long-lasting and safe operation

- The monitoring system enables the monitoring of processes and continuous operation without delays and oscillation.

Investment in an individual facility is returned within less than 2 years.

Class

1



HR.6.

Title

Nikel Remove Control 365 Cellulite

Authors

Mirjana Brlecic

Institution

PRIRODA LIJEČI d.o.o.

Patent no.

001622580-0001, 001622580-0002

Description

This new and highly effective liposomal formula against cellulite is based on a combination of active ingredients that work synergistically. Pharmacy and cosmetology are related and intertwined. The herb that has a positive effect on the body and the skin taken orally, equally acts when applied

directly to the skin. NiKEL philosophy and the chosen ingredients for NiKEL products are based on this principle.

CONTROL 365 complex is an intense formula for reducing cellulite, for firm, smooth and glowing skin. Helps boost natural collagen production so skin looks contoured, toned-up and lifted.

CONTROL 365 complex contains active components of Geinstein - soybeans aglikon flavonoid (no GMOs), Spirulina Algae, Caffeine, Carnitine, Red Pepper, Black Pepper, Almond, Sunflower.

Dermatological examination:

Multiple focused tightening and anti-cellulite action

Cellulite decreased by 32%

The thigh weight decreased by 3.8%

Skin Firmness Improved by 60%

**Class**

4



**HR.7.**

**Title**

**Wooden connector „winglet“**

**Authors**

**Igor Puhar**

**Institution**

**Radiona SKATT d.o.o.**

**Patent no.**

**EU RCD 005798261-0001**

**Description**

The wooden connector named the „Winglet“ allows the connection of up to three wooden beams using the same connector in a very easy way. Existing wooden connectors made for connecting three beams are produced to fit beams of certain predefined dimensions and require a significantly more complex production process, which rises the production prices. The displayed wood connectors can be

INTERNATIONAL EXHIBITS

mounted in different orientations depending on the force distribution on the beam joint. That flexibility is simply not possible with any other wood connectors.

**Class**

7



**HR.8.**

**Title**

**Pneumatic Muscles Driven Autonomus Vehicle**

**Authors**

**Author: Sime Grbic ; Menthor: Zeljko Situm**

**Institution**

**Faculty Of Mechanical Engineering And Naval Architecture Inventors Organization**

**Patent no.**

Patent application

**Description**

Compressed air as a source of energy attracts the constant attention of scientists and engineers, especially in the case of mobile systems in terms of ecological fuel in vehicles with pneumatic drive. Artificial pneumatic muscle, resulting from interdisciplinary research in the field of robot manipulators and biological systems, is an interesting choice of actuator type to be used for autonomous vehicle operation.

Advantage:

Numerous companies and research groups at universities around the world are developing mobile autonomous systems with different goals and motives of research. Mobile systems with alternative drives, advanced management and management capabilities in unstructured environments are

one of the most demanding tasks of modern technology. This highly interdisciplinary area encompasses the synthesis of mechanical, electronic, control and programming engineering, and is one of the most complex and most interesting engineering tasks. The constructed autonomous vehicle comprises the above-mentioned tendencies.

**Class**

8

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**HR.9.**

**Title**

**Device for testing the characteristics of ultrasonic welding**

**Authors**

**Dubravko Rogale, Zeljko Knezic, Snjezana First Rogale, Martina Bobovcan Marcelic**

**Institution**

**Tekstilno-tehnoloski fakultet Sveuciliste u Zagrebu**

**Patent no.**

Patent application

**Description**

Description:

The device is used to measure the characteristics of the seams created by the ultrasonic joining technique. The appliance can measure the thickness and height of the extruded edges, the seams created during joining and the thickness of the seams.

The characteristics of the compounds formed by high-frequency joining technique can be measured.

Advantage:

There is no similar device on the market

Intended use:

The device is intended for factories that use high technology joining techniques for polymer materials, research institutes and faculties. The device determines optimal working parameters.

**Class**

6

## Germany

*German inventors Association "DEV"*

### DE.1

#### Title

**Isoversiometer**

#### Authors

Dorothee Geiser

#### Patent

**DE 100 37 375 C 2**

The Isoversiometer is a head-mounted system for measuring eye movements and ocular motility as well as head position by using direct observation. The device is easy to use and can document the eye muscle function of one or both eyes from a range of 0° to 180°.

Eye motility or eye movements are tested with mobile eye tracking systems. It is thought to be helpful in determining the movement of each eye at its best. The Isoversiometer test is performed to evaluate the position of the head as well as the muscle function of each eye in specific directions relative to the head. Any head movements do not falsify the range.

#### Description EN

Examination of eye motility with the Isoversiometer is easy and comfortable for both test person and examiner. The person is asked to enumerate the colour of the pearls one after another, beginning with the red one which is positioned straight ahead. The fixation time is not significant nor the moving of the head. You can measure the field of gaze monocularly, as well as the fusional amplitude and also the head position.

Class no.

4



**DE.2****Title****HYDROGEN GAS HIGH PRESSURE STORAGE SYSTEM****Authors**

Moshe Stern

**Institution**

C .EN LTD

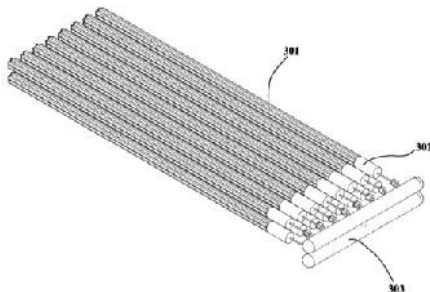
**Patent**

US 9,882,229 B2

**Description EN**

A device for the storage of compressed hydrogen gas comprises a plurality of glass capillary tubes each having a sealed extremity and an open extremity, wherein said plurality of glass capillary tubes is sheathed in an external tubular cover, and wherein the open end of a bundle of said tubular covers is housed in an adaptor, and wherein said adaptor is suitable to allow compressed hydrogen gas to be added to, and to prevent said hydrogen gas from escaping from, said glass capillary tubes.

The invention is also directed to a method for generating a capillary tube with one closed end, which is suitable for use with the device of the invention, comprising providing an open-ended capillary tube, applying a glass cupping to one open end and then melting the glass at said end.



**By Prof. Corneliu Munteanu / Prof. Dan Eliezer**

# Egypt

**EG.1.**

**Title** Anti-sliding for car On Snow

**Authors** Adel Saber Ahmed Shehata

**Patent no.** Pending 2019 \ 49

**Description**

Is a 2-column installed at the end of each gear column installed each of them in one of the sides of the rear tire axis of the car and connected to the brake oil department and when the brakes are pressed strongly and before the car begins to crawl The gears are lowered to stop the car in the ground with the force of friction with asphalt and prevents sliding cars on snow or ice fully and effectively

**Class**

8. Aviation, car industry and transportation



## Hong Kong

### HK.1

**Title**

**Intravenous Drip Sensor**

**Authors**

PAN, Wending

**Institution**

**The University of Hong Kong**

**Description EN**

This is a sensor for intravenous drip. The main purpose of the invention is when the patient has a drip-feeding, attached a sensor which connects with a beeper at auxiliary drip bottle. The detector will detect the lower level of the auxiliary drip bottle automatically when it is about to use up, and immediately notify the buzzer on a beeper to give a warning sound to inform the medical personnel to make a replacement of the new bottle.

**Class no.**

4





## India

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**IN.1.**
**Title**

**Fly ash based geopolymer concrete incorporating rubber tire fibres as partial replacement of natural sand thereof useful for construction & infrastructure industries.**

**Authors**

Dr. Sandeep Chaudhary, dr. Salmabanu Luhar, dr. Urmil Dave, dr. Ismail Luhar

**Institution**

Malaviya National Institute of Technology

**Patent no.**

Patent application No.201811028519 A

**Description EN**

The present invention relates to develop a Fly ash based Geopolymer concrete incorporating rubber tire fibers i.e. rubberized Fly ash based Geopolymer concrete, useful for construction industry. The process to manufacture rubberized Fly ash based Geopolymer concrete require low Calcium Fly ash, Sodium Hydroxide as activator, Sodium Silicate as hardener, 10 percent rubber tire fibers preferably recycled rubber tires from automobiles for partial replacement of natural Sand, aggregates and a very little quantity of distilled water. Moreover, superplasticizer can also be admixed with the rubberized Geopolymer concrete compositions to have desired workability of the Geopolymer concrete as an additional material. The process can be carried out at room temperature but to obtain earlier strength it has been carried out at 90°C and atmospheric pressure to obtain the best results. This proves it to be a low energy product. This process is not only eliminates the binder like Ordinary Portland Cement (i.e. OPC), but also eliminates water curing and consumes diminished quantity (10 percent less) of natural Sand - a product of restricted natural resources. Moreover, the incorporation of waste rubber tire fibers resolves the problem of its disposal and land filling to some extent analogous to Fly ash which too is a residual waste profoundly accessible from coal based thermal power stations facing the same dilemmas. The process emits nine times less Carbon Dioxide than Portland cement which provides relief to the burning enigma of global warming. Therefore, this invention is an inexpensive, environmental and user friendly as well as it converts the wastes into the best in its manufacturing. Furthermore, compressive strength of Fly ash based Geopolymer concrete remains almost similar even after incorporating ten percent rubber tire fibres.

Class no.

7. Buildings and Materials

IN.2.

<b>Title</b>	<b>Fly ash based geopolymer concrete incorporating rubber tire fibres as partial replacement of natural sand thereof useful for construction &amp; infrastructure industries.</b>
<b>Authors</b>	Dr. Sandeep Chaudhary, dr. Salmabanu Luhar, dr. Urmil Dave, dr. Ismail Luhar
<b>Institution</b>	Malaviya National Institute of Technology
<b>Patent no.</b>	Patent application No.201811028519 A
<b>Description EN</b>	<p>The present invention relates to develop a Fly ash based Geopolymer concrete incorporating rubber tire fibers i.e. rubberized Fly ash based Geopolymer concrete, useful for construction industry. The process to manufacture rubberized Fly ash based Geopolymer concrete require low Calcium Fly ash, Sodium Hydroxide as activator, Sodium Silicate as hardener, 10 percent rubber tire fibers preferably recycled rubber tires from automobiles for partial replacement of natural Sand, aggregates and a very little quantity of distilled water. Moreover, superplasticizer can also be admixed with the rubberized Geopolymer concrete compositions to have desired workability of the Geopolymer concrete as an additional material. The process can be carried out at room temperature but to obtain earlier strength it has been carried out at 90°C and atmospheric pressure to obtain the best results. This proves it to be a low energy product. This process is not only eliminates the binder like Ordinary Portland Cement (i.e. OPC), but also eliminates water curing and consumes diminished quantity (10 percent less) of natural Sand - a product of restricted natural resources. Moreover, the incorporation of waste rubber tire fibers resolves the problem of its disposal and land filling to some extent analogous to Fly ash which too is a residual waste profoundly accessible from coal based thermal power stations facing the same dilemmas. The process emits nine times less Carbon Dioxide than Portland cement which provides relief to the burning enigma of global warming. Therefore, this invention is an inexpensive, environmental and user friendly as well as it converts the wastes into the best in its manufacturing. Furthermore, compressive strength of Fly ash based Geopolymer concrete remains almost similar even after incorporating ten percent rubber tire fibres.</p>
<b>Class no.</b>	7. Buildings and Materials

**IN.3.****Title**

Durability studies of Geopolymer concrete containing waste rubber fibres as partial replacement of Sand

**Authors**

*DR.Luhar Salmabanu Ismailbhai*

**Institution**

**Malaviya National Institute Of Technology**

**Description EN**

A research project for “Durability studies of Geopolymer concrete containing waste rubber fibres as partial replacement of Sand” was carried out successfully in time as “Principal Investigator” under “Women Scientist” Scheme for Department of science and technology, Ministry of science and technology, Government of India, which was awarded to me during 2015-2017. I have developed a novel Fly ash based Geopolymer Concrete containing rubber fibers, i.e., a rubberized geopolymer concrete (RGPC) in the course of the said investigation. I have studied this novel RGPC in comparison with its controlled geopolymer concrete. Both concretes were examined in context of their performance evaluation viz. compressive strength, flexural strength, split tensile strength, modulus of elasticity, pull-off strength, water permeability, abrasion resistance, carbonation, drying shrinkage, corrosion, sorptivity, acid attack resistance, sulphate attack resistance, chloride diffusion, rebound hammer test, ultrasonic pulse velocity test and micro structure. Not merely that, the study of effect of various parameters viz., alkaline liquid to fly ash ratio, rest period, curing temperature, curing period, concentration of NaOH solution, alkaline liquid ratio, addition of super plasticizer, extra water content on compressive strength of RGPC were also carried out and its outcomes have been compared with controlled-GPC. In this research study, the development of fly ash based RGPC was made by employing 10% by weight of rubber fibres as a partial replacement of fine aggregate – natural sand. The findings revealed that, RGPC have exhibited a significant compressive strength along with excellent attributes of water permeability, sulphate resistance, salt resistance, corrosion, sorptivity, chloride diffusion, carbonation resistance, and shrinkage, as compared to controlled-GPC proving it a meaningful research. To sum up, RGPC and control-GPC have offered definite, tangible advantages over OPC-concrete in terms of strength and durability properties proving suitability of earlier as alternatives of the later on.

## EUROINVENT 2019

### APPLICATIONS:

- For the very first time, an innovative type of construction concrete product with incorporation of rubber fibres obtained from waste rubber tyres as fine aggregates partly replacing natural Sand with Fly ash based Geopolymer concrete, i.e., a rubberized Geopolymer concrete (RGPC) has come into existence with its quantified data on strength and durability, which formed the basis for acceptance of its properties under varied conditions as durable, sustainable and potentially promising building material to sustainable concrete industry.
- The outcomes of the project have filled the hiatus and provided the confidence to the users, and site engineers to utilise this novel product in form of RGPC effectively.
- The research has confirmed the viability of incorporating rubber fibers with Geopolymer concrete constructions and obtained the clear and useful results, which will prove to be very helpful to develop sustainable and eco-benevolent concrete to “Go Green”.
- Research and industry groups are excited about the prospect of concrete made from industrial by-products, which has obviated the need to dispose of these materials.
- Brought the engineering community more closely towards sustainable construction by addressing three fold problems such as safe disposal of fly ash and waste rubber tyres, lack of river sand as fine aggregate for concrete and carbon dioxide emissions due to conventional cement production

### ADVANTAGES:

- Nine times less Carbon footprints,
- Six times less energy consumption,
- No necessity of high energy intensive reactions at elevated temperatures,
- User and eco-friendly,
- Cost-effective,
- Conservation of natural restricted resources of rocks and minerals,
- Relief to dilemmas like Global warming, land fillings and pollution of environment, soils, surface and sub surface water.

## Indonesia

Represented by

*Indonesian Invention And Innovation Promotion Association (INNOPA)*

### ID.1.

**Title**

*Trouble Shooting Simple 4 Wheeled Vehicles and 2 Wheels*

**Authors**

*Abdillah Ash Shiddiqy*

**Institution**

*Surya Buana Malang Indonesia SHS*

**Patent no.**

-

**Description EN**

The problem that often occurs in vehicles is a dead engine or a leaky tire. This will be serious if it occurs in a quiet area and there is no workshop, especially if the driver does not understand the workshop so that it needs a special solution that is light. one model of a simple engine damage solution is to install an ac motor with the voltage of the vehicle accumulator. While if there is a leaky tire, it can make the liquid from the gum mixed with used olie to form an adhesive that can close the tire automatically from inside the tire.

**Class no.**

6. Mechanical Engineering



**ID.2.**

**Title** Soy Sauce Based Sunflower Seeds  
**Authors** Mardiyah Jusuf Hasan Mansoor, Salsabila Hasna Fathiyah, Abdillah Ash Shiddiqy, Siti Lailis Syaiban  
**Institution** **Surya Buana Malang Indonesia**  
**Description EN** Sunflower seeds contain almost 90% of the fat in sunflower seeds are good fats, unsaturated fats. Sunflower seeds also contain monosaturated fats which help reduce total cholesterol and LDL cholesterol (bad cholesterol) while increasing HDL cholesterol (good cholesterol). In addition, sunflower seeds contain Vitamin E and Vitamin B 1 (Thiamin). Manganese, magnesium, copper, selenium, phosphorus, vitamin B 3 (Niacin), vitamin B5 (Pantothenic) and folate can also be found in amounts that are good in sunflower seeds. These sunflower seeds are very beneficial for the body. If it is processed into soy sauce it will be more delicious and has a high selling value.  
**Class no.** 3. Agriculture and Food Industry

**ID.3.**

**Title** **Balsem Waste Recovery Based On Cane Extract**  
**Authors** Salsabila Hasna Fathiyah, dr. Miryanti Cahyaningtias  
**Institution** **Surya Buana Malang Indonesia SHS**  
**Description EN** Sugarcane is a plant with high sugar content and is the biggest sugar-producing commodity. During this time the sugar cane is taken only while the pulp is only used as animal feed or fertilizer. This sugarcane pulp still contains sugar content if extracted and mixed with oil then formed into a balm so that it can be used as a healing wound to dry quickly, especially for sufferers of diabetes mellitus. Diabetes sufferers have high sugar levels in their blood, which makes it difficult to dry wounds. If the wound is smeared with substances containing sugar, there will be a physical bond in cohesion and adhesion and chemically in the form of carbon and ionic bonds that help accelerate wound recovery. With the extraction method, a cheap and simple wound recovery balm can be obtained.  
**Class no.** 4. Medicine – Health Care - Cosmetics



**ID.4.**

**Title**

**SOLIDPRO: Modular Bionic Hand for Transradial Amputation Integrated with Force Sensing Resistor and Solar Cell**

**Authors**

Eko Wahyu Saputro, Rilo Berdin Taqriban, Wahyu Fadhil Mauladin, Rachelia Intan Merdina, Mardiyanti Dwi Pratiwi, Mochammad Ariyanto, ST., M.T

**Institution**

**Universitas Diponegoro**

**Description EN**

The era of globalization requires industries in the field of health technology to continue innovating and develop appropriate technology without ignoring its quality standards. Prosthetic hand products in Indonesia are still unable to produce good quality products. Local products are less comfortable to use, inflexible, nonergonomic and have a short lifespan. If there is a problem or damage to the product's components, it requires a large amount of time and cost. On the other hand, domestic bionic hand products are heavy and low exchangeability. Based on these problems, we design a study on SOLIDPRO, a bionic hand for amputation of the lower hand elbow. SOLIDPRO has a modular system with several modular features that can be add or replace. Modular technologies that can be applied to SOLIDPRO are arduino nano, servo motor, force sensing resistor (FSR) and lipo battery integrated with solar cell charging. Tests are carried out using the Usability principle by applying the Southampton Hand Assessment Procedure (SHAP) method. The results obtained are in the form of percentage 4 of the 5 Nielsen Model criteria and recapitulation of the USE Questionnaire. The total score of the USE questionnaire was 88.5% which could be categorized as "Excellent". In addition, ASTAKARA can carry out 15 of 20 SHAP activities provided. This research can be an innovation in developing bionic hand in the future.

**6 Mechanical Engineering**

Class no.



# Iran

*By Iranian Top Inventors*

**IR.1.**

**Title**

**Katrin Queen**

**Authors**

**Sepideh Karimi Tabasi**

**Description EN**

We combine traditional and modern-day techniques to ensure you get the very best quality without compromise. Clothing that perfectly flatters your shape, posture, and style, something that reflects your personality, fits your personality while being fully functional, comfortable, and fit for purpose. various patterns and cuts designed to compliment your individual shape and style.

Class no.

14





**Iraq**

Represented by  
**Iraqi Forum of Inventors**

**IQ.1.****Title****Hard Plowing Machine (Cr)****Authors**

Dr. Ali alzamili

**Institution***University of Qadisiyah***Patent no.**

5149

**Description EN**

Is a mechanical device in the form of a boat designed to improve the skill of rowing in addition to codifying the state of training for this type of sporting events as well as to develop the level of fitness for international players as well as young players and to broadcast the spirit of competition and confidence and psychological stability of the player through the existence of a small electronic device installed in front of The player gives data on the distance traveled and the maximum speed reached by the player and the time it takes through feedback from the electronic device installed in front of him. It is a device that can drive and place in the gym or the yard of the house.

**Class no.**

13

**IQ.2.****Title****Eradication of Tumor tissues device fast and painlessly****Authors**

Salam Shaheed Shukur

**Institution****General company of Iraq Ports/ Arabian Gulf Academy for Maritime Studies****Patent no.**

5002 / Patent application No. 25/7/2017

**Description EN**

## EUROINVENT 2019

The device consists of a thin needle with a pointed head like the head of the pin. The area close to the tip contains cracks and small sharp beads. This needle is placed into a metal tube and sealed by the piston. inside the cylinder or the metal tube and around the surgical needle amount of anesthetic fluid. At the front of the tube there is a spongy disk with a small intermediate hole for the passage of the surgical needle through. The benefit of this sponge disc is the preservation of anesthetic fluid within the metal tube and the preservation and absorption of disinfectant and then delivered to the outer surface of the skin of the tumor. the device contained a bottle of compressed air and a rubber tube and valve Control over the air to the inside of metal tube see Figure (A, B).

This device is very useful and practical due to its small size, small number of components, dose not have any accessories (Free of accessories) and the availability and low price of the used materials.

Using this device will reduce the required number of surgical operations by the early detection of the tumor (cancerous or not) before taking it off.

The device is used in all the hospitals and clinics in order to identify whether the tumor is cancerous or not before taking it off.

Class no.

4

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### IQ.3.

<b>Title</b>	<b>Spaceman Gravity Disc</b>
<b>Authors</b>	Salam Shaheed shukur
<b>Institution</b>	<b>General company of Iraq Ports/ Arabian Gulf Academy for Maritime Studies</b>
<b>Patent no.</b>	5443 / Patent application No. 26/7/2018 Spaceman gravity disc is a metallic ring which upper surface contain of a multi holes to pass compressed oxygen through it to make reaction that helped spaceman to have been capable against a gravity less which at space ship or at planet which have a little gravity such the moon .Spaceman gravity disc contain of metal holes ring. rubber tube. valves. fixed
<b>Description EN</b>	

electromagnetic coil. metal piece with tension spring. levers and compressed oxygen bottle. This disc is very useful for spacemen by helping them to stay stabilised and balanced in low gravity conditions and prevents osteoporosis which is caused by the low or no gravity. Spaceman Gravity Disc application at the Spaceships or at Planets which have little gravity such as the moon.

Class no.

8

**IQ.4.**

**Title**

**DNA extraction from Staphylococci using boiling by distilled water and sudden freezing**

**Authors**

**Marwa. H. Al-Khafaji, May Talib Flayyih**

**Institution**

**Deptatment of Biology, College of Science, Baghdad University**

**Patent no.**

**5687 / Patent application No. 2018/365**

**Description EN**

The study aimed to obtain a simple and inexpensive method to extract DNA of *Staphylococcus* spp. without the use of irritating chemicals and artificially manufactured kit , which need additional expensive enzymes . Food samples from cheese and milk were obtained from local Baghdad markets , *Staphylococcus* spp. was isolated by conventional methods and identified by biochemical and serological tests as *Staphylococcus aureus* , *S.chromogenes* and *S.epidermidis*. The bacterial colonies suspended in DNase free distilled water ; instead of enzymatic lysis of the rigid staphylococcal cell wall by lysostaphin, a heat shock technique was used to achieve physical cell wall disruption through applying heating the sample and the sudden freezing. For bacterial cell wall lysis different temperatures and incubation times were tested. DNA was extracted by using high temperatures of 85 ° C for 20 minutes and then immediate freezing for 10 minutes. Thereafter it had been centrifuged at 10000 rpm for 5 min. Supernatant was examined for quantity, purity and quality by spectrophotometer and agarose gel electrophoresis of 0.8% agarose for 1 hour at 70 volts.The modified method of this study is a quick method and reduces the effort and economic cost of traditional methods of DNA extraction from

*Staphylococcus* and can be applied to the molecular diagnosis of *Staphylococcus aureus* and intestinal toxins in imported food in our country . The extracted DNA was pure and was amenable to further molecular techniques, including agarose gel electrophoresis, and PCR.

Class no.

4

**IQ.5.****Title**

**A device for measuring the elasticity of the backbones**

**Authors**

Dr. Ali alzamili

**Institution**

*University of Qadisiyah*

**Patent no.**

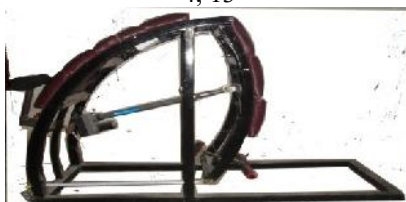
5416

**Description EN**

The aim of the design of a device to qualify and measure the angle and flexibility of the backbone of the hard students of the faculties of physical education and players clubs and national teams to play that skill correctly and accurate mechanism and free of complexity and routine because it can be performed at home or club or gym and can be a means of medical rehabilitation For people with spinal deformities or rehabilitation of those with spinal injuries and in order to get the best results with a very short time and as a result of the best and to increase the broadcast of the spirit of excitement and excitement and motivation of the learner in order to improve the level of agility and flexibility and Rehabilitation of players. Therefore, it was necessary to manufacture a device characterized by performance of the traditional routine performance and the possibility of reducing the time and effort and the researcher believes that it is the first of its kind to measure and rehabilitation and to develop flexibility and agility and the regulation of training loads for national teams players.

Class no.

4, 13



INTERNATIONAL EXHIBITS

**IQ.6.****Title**

*The Effect of Aqueous Extract of Iraqi Lantana Camara L. Plant, as bleeding stop material.*

**Authors**

ENAS MEHJEN NUMAN

**Institution**

*Ministry of Industry & Minerals.*

**Description EN**

*Corporation of Research & Industrial Development.*

(5610) / Patent application No. (157/2017)

## Class no.

The aim of present study was to evaluate the effect of crude extracts (alcoholic, aqueous) of Iraqi *Lantana camara L.* leaves which return to (verbenaceae) family using different traditional methods as bleeding stop material. All types of crude extracts of *Lantana camara L.* contains a number of medicinally important compounds, that were indicated by phytochemical analysis in different amount such as tannins, carbohydrates, glycosides, phenols, resins, flavenoids, alkaloids and terpens. The acute toxicological and histopathology effects of crude extracts of *lantana camara L.* leaves that administered orally to groups of mice showed that the extracts were practically non-toxic. also the test of both extracts of *lantana camara L.* leaves showed its worked as stopping blood bleeding.

4

**IQ.7.****Title**

**Transplantation technique in Maize.**

**Authors**

Nadir Flayh Ali Almubarak.

**Institution**

**University of Diyala, College of Agriculture, Department of Field Crop Sciences .**

**Patent no.**

-

**Description EN**

The maize crop in the spring season has clear advantages that make it more important and interesting by farmers and prefer the maize crop in the autumn season in Iraq. One of the most important problems impeding the cultivation of maize crop in the spring season in Iraq is the temperature during the period of flowering (end of May) to more than 35 ° C, which causes the increase of the proportion of ovaries aborted due to dry pollen and dry bristles, which adversely affect the fertilization

process .

A number of studies have been carried out by Iraqi researchers for a long time to solve the problem of maize cultivation in the spring season. However, this problem has not been addressed to reach practical results based on scientific evidence.

The production of seedlings of good quality and then growing in the field instead of planting grain directly in the field will be able to overcome some of the environmental factors inappropriate at the beginning of the crop season and will give a good harvest early.

Class no.

3

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### IQ.8.

**Title**

**Develop an innovative method for early detection of sexually transmitted diseases in female and male, which includes the most common types of viruses, bacteria and fungi in one test with a very high sensitivity and specificity within 2-3 hours**

**Authors**

Mohammad Ibraheem Mezaal Atheab, Maad M. Shalal

**Institution**

**Genome Group for Clinical and Research Services  
College of Medicine – University of Baghdad**

**Patent**

5528 / Patent application No. 354/2018

**Description EN**

A new innovative method of early molecular diagnosis is designed to detect the most common types of microorganisms (Bacteria, Viruse and Fungi) that transmit sexually from male to female and vice versa.

This molecular method was designed using the tools of bioinformatics (computerize Genetics) and available in the Internet, and the use of the sequences of these microorganisms through the global databases. Therefore, each of the patients has a single test consisting of three parts (Tube1, Tube2 and Tube3) and by Real Time PCR using four different filters in the device Each filter can read a specific dye according to its wavelength and each dye associated with a particular target (bacteria, virus and fungus) and thus the possibility of a positive or negative diagnosis

Class no.

4

**IQ.9.****Title**

**Designing an electronic device for the development of some bio Kinematic changes to the angle of throwing the disc**

**Authors**

Ferdous Majeed , Zaenab Abd Elrahim

**Institution**

University of Diyala - College of Physical Education and Sports Sciences

**Patent**

2017/626

**Description EN**

The effectiveness of discussing is one of the activities that require the availability of physical abilities and the performance of throwing and its relation to the angles that are involved in many calculations that are in accordance with the laws of movement and aims to develop the athletic achievement of this event.

When it is intended to identify the level of the Rami in the measurement of the angles (previously) is done by kinetic analysis using the analysis program (Kinovea0.8.7) and take the value of the analysis of a standard of its level and capacity, and this requires time and effort to conduct the analysis to obtain values either using the current design device can be identified The value of the corner of each and every shot for each player individually and for each part of the body parts angle (shoulder, knee, shoulder and knee together) during the training, this added to the training process a new and timely way to identify the level of Rami and quantitative estimate and the least time and effort on the coach and athlete The great benefit of this The device is to identify the ideal angles in the throwing of global models, ie, to give a specific range in the course of the training to the shoulder angle, for example, from 7590 degrees, When the rami passes during the performance of this ring, the device will beeping, ie, issuing a warning sound, indicating that the player is out of the specified range of the angles. The ring is reduced and the level of the player is reached until the ideal angles are reached. The device is designed to fit all measurements Shooters where the player can perform shooting freely and without hindrance to movement. The value of the angles is displayed on the LCD screen that is mounted

on the player's chest. For the purpose of benefiting from this in:

- Identify the value of the shoulder and knee angle for each individual marker and accurate numerical assessment using a special test in throwing.
- High accuracy in reading angles and observing the measurement of height and low angles on the screen for each Rami during the performance period.
- Identify the number of mistakes made by the player during the performance when the specified range of angles in each shot is achieved by displaying the number of errors on the screen.
- Determine the strengths and weaknesses of the player to be processed by the trainer based on the digital readings given by the device.

Class no.

12



**IQ.10.**

**Title**

**An effective method to treat Hypercholesteremic and Hyperlipidemia using natural substances.**

**Authors**

Ahmed A. Qaso

**Institution**

**Polytechnical University of Duhok**

**Patent**

5423

**Description**

Dietary supplement is without any acute or chronic toxicity and without any adverse effects. The ingredients of the product are

**EN**

highly therapeutic with a wide spectrum on all vital organs, we reached to these benefits from applications on a group of volunteers. Following is a summary of the benefits of the components of the supplier:



## EUROINVENT 2019

- 1 -Treatment for hyperlipidemia and hypercholesterolemia.
  2. Reduce liver enzymes GOT, GPT and T. Bilirubin, for various reasons.
  - 3 -Treated many types of kidney stones, especially staghorn stone.
  - 4 -Treatment for Hypothyroidism.
  - 5-Treatment for many types of cysts, especially Hydatid cyst.
  - 6 -Treatment for most types of cancer (bladder cancer and breast cancer).
  - 7 -Very useful give Energy, Activity and increase appetites.
- There is a Booklet certificate these benefits if allowed to send.

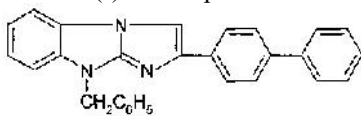
Class no. 4

### IQ.11.

<b>Title</b>	<b>9-BENZYL-2-BIPHENYLIMIDAZO[1,2-A]BENZIMIDAZOLE AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF THAT EXPRESS PROPERTIES OF DESTROYERS OF TRANSVERSAL CROSS-LINKS OF GLYCOSYLATED PROTEINS</b>
<b>Authors</b>	Zhukovskaya Olga Nikolaevna (RU), Anisimova Vera Alekseevna (RU), Morkovnik Anatolij Savelevich (RU), Petrov Vladimir Ivanovich (RU), Spasov Aleksandr Alekseevich (RU), Rashchenko Andrej Igorevich (RU), Brigadirova Anastasiya Andreevna (RU), Abbas Haider Sabri Abbas (IQ)
<b>Institution</b>	<b>"Southern Federal University" (RU), Federal State Budget Educational Institution of Higher Education "Volgograd State Medical University" Ministry of Health of the Russian Federation (RU)</b>
<b>Patent</b>	RU 2 627 769 C1 / Patent application No. 2016142566, 28.10.2016
<b>Description EN</b>	The invention relates to new compounds in a series of derivatives of 2,9-disubstituted imidazo [1,2-a]

INTERNATIONAL EXHIBITS

benzimidazole, namely to the previously undescribed 9-benzyl-2-biphenylimidazo [1,2-a] benzimidazole of formula (I) and its pharmaceutically acceptable salts.



The compound exhibits the property of a destructive crosslinker of glycated proteins and can be used primarily in the complex therapy of sugar diabetes and its complications. Pathological conditions of diabetes mellitus processes as a critical component include extremely destructive in its consequences non-enzymatic glycation reaction proteins, during which the accumulation of glycoproteins, including crosslinking of glycoprotein macromolecules leading to deterioration functional properties, in particular, due to the loss of their elasticity. It is in full measure, for example, to red blood cells and is the cause of very serious complications of diabetes, including ophthalmologic, neurological and cardiovascular vascular. Protein glycation also increases the risk of developing oncological diseases. It should be noted that to achieve reversibility initiated by glycation processes using inhibitors glycation is fundamentally impossible. This requires connections to potential cross-linkers in the final glycation products (CNG), the use of which can lead to the restoration of elasticity collagen frame of the cardiovascular system and, as a result, effective treatment of remote complications of diabetes.

Class no.

4

## IQ.12

### Title

**Easy and Fast Mechanism for Produce Translucent Concrete**

### Authors

Safaa Adnan Mohamad , Shakir Ahmed, Hasan Hamodi  
**University of Al-Mustansiriya /college of engineer/  
Department of Highway and Transportation  
engineering**

### Institution

### Patent

4600 / Patent application No 357/2015

### Description EN

Translucent Concrete used in many applications external

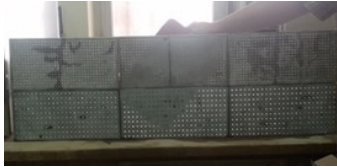
## EUROINVENT 2019

inner walls, bookshelves and sunshades, tables, statues, lamps..etc.

1. Translucent concrete has very good architectural properties for giving good aesthetical view to the building.
2. Translucent concrete can help add a great deal of security and supervision in places like schools, museums and prisons etc, where the presence of the people and their actions are seen but not their entire image, thereby protecting their privacy as well.
3. The fibers in Translucent concrete also work as heat insulators, so they'll be very effective in cold and hot countries, thereby reducing energy and saving lots of money in both the cases.

Class no.

7



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### IQ.13

**Title**

**Blood Viscosimeter**

**Authors**

Salam Shaheed Shukur

**Institution**

**General Company of Iraq Ports / Arabian Gulf Academy for Maritime Studies**

**Patent**

5314 / patent application no 2018/4/4

**Description EN**

Viscosimeter used to measure blood viscosity. An blood liquid submit to constant sheering force with constant and complete shearing area. Device contain from carrier of pressure spring and spring disc which contact with small metal ball moved at metal bar to stop and operation timer watch, also contain from glasses or plastic tube to see blood liquid through it, viscometer contain of suction blood needle, ruler measurement and crack rubber ball to increase sheering area of liquid layer. Is easy to use, low costs, light weight, low number of components, fast result

Class no.

4

## Italy

### IT.1.

**Title**

**Euterpe Method (Metodo Euterpe)  
Sound in Multisensory Stimulation**

**Authors**

Tommaso Liuzzi

**Institution**

**Euterpe Cultural Association  
(Associazione Culturale Euterpe)**

**Patent no.**

Patent application No. 302018000034627

**Description EN**

This method is defined as an artistic-musical therapeutic psychopedagogy. The use of sound through multisensory stimulation, develops well-being and psycho-physiological balance towards a process of autonomy, self-fulfillment and social inclusion. Currently the method is used in schools, in disabilities, for drug addiction, in autism and in hospitals (oncology and neurology).

**Class no.**

4



## Japan

**JP.1.**
**Title**
**THE CATAPULT GLIDER WITH LIGHT EFFECT**
**Authors**

Ralf John

**Institution**

くしろこうりつだいがく、

**Kushiro Public University of Economics**
**Patent no.**

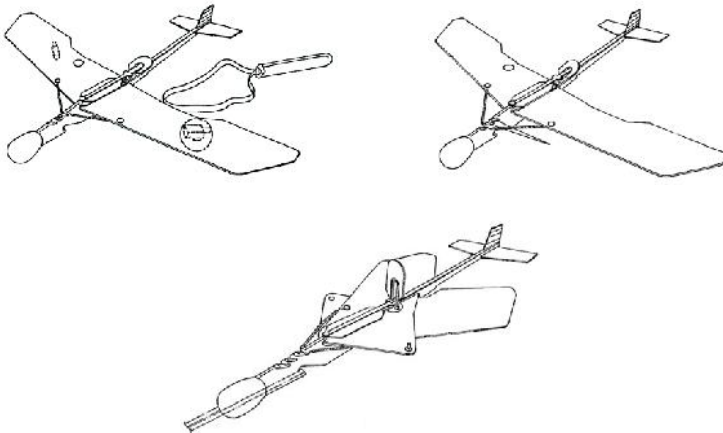
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**Description EN**

The general catapult glider is not with light effect. When it's dark, it is difficult to see the flying route of the catapult glider and not be able to adjust the height and the distance. The feature of the invention is to install the Illuminators on the two wings. The front of the glider is to control the height and the distance; furthermore, the angel of the wings can be adjusted to 90 degrees (parallel) or 45 degrees (tilt).

**Class no.**

13



## Kazakhstan

### KZ.1.

**Title** **A method for diagnosis of perinatal hypoxia in full-term newborns from mothers with preeclampsia.**

**Authors** Akylbek Tussupkaliyev, Andrey Gaiday

**Institution** West Kazakhstan Marat Ospanov Medical University

**Patent no.** **A1G01N33/573** / Patent application No.

**201700173/2017**

### Description EN

The proposed method relates to the field of clinical medicine, namely obstetrics and perinatology. A method for the diagnosis of perinatal hypoxia in full-term newborns from mothers with preeclampsia, characterized in that endothelin-1, the total metabolites of nitric oxide, homocysteine and vascular endothelial growth factor are determined by the immunoenzyme method, and, when the content of endothelin is 1 more than 2.3 pmole / l, total metabolites of nitric oxide more than 142.1  $\mu\text{mol}$  / l, homocysteine more than 4.0  $\mu\text{mol}$  / l, vascular endothelial growth factor less than 111.1 pg / ml, perinatal hypoxia is diagnosed. The introduction of this method of diagnosis will allow an early (on the first day of the child's life) diagnosis of perinatal hypoxia; quantify the concentration of endothelin-1, total metabolites of nitric oxide, homocysteine and vascular endothelial growth factor in the serum of newborns, improve the accuracy of diagnosis of perinatal hypoxia of the brain, determine the management tactics and timely assignment of appropriate therapy, monitor the effectiveness of therapeutic measures.

Class no.

4

### KZ.2.

**Title** **Impact of Homocysteine to the Development of Hypertensive States in Pregnancy**

**Authors** Akylbek Tussupkaliyev, Andrey Gaiday, Saule Bermagambetova

**Institution** West Kazakhstan Marat Ospanov Medical University

### Description EN

The proposed method relates to the field of clinical medicine, namely obstetrics and perinatology. The results of the study make it possible to predict preeclampsia based on the level of homocysteine in the serum. A certain level of homocysteine in the first trimester of pregnancy above 9.55  $\mu\text{mol/l}$  can be used as a method for predicting hypertensive states during pregnancy. The severity of the hypertensive state can be

## EUROINVENT 2019

predicted by the level of homocysteine in the first trimester of pregnancy: one can expect the development of mild preeclampsia at the level of homocysteine above 10.58  $\mu\text{mol/l}$ , severe preeclampsia at the level of homocysteine above 11.93  $\mu\text{mol/l}$ . The level of homocysteine in the second trimester of pregnancy above 12.56  $\mu\text{mol/l}$  can be used to diagnose severe pre-eclampsia, and the level of homocysteine above 24.87  $\mu\text{mol/l}$  for eclampsia. In the third trimester of pregnancy, homocysteine levels above 15.4  $\mu\text{mol/l}$  can be used to diagnose severe pre-eclampsia, while homocysteine levels above 23.59  $\mu\text{mol/l}$  suggest the development of eclampsia.

Class no.

### KZ.3.

#### Title

**Assessment of T-cells emigration from the thymus of patients with Diabetes Mellitus type 2 treated with metformin**

#### Authors

Olzhas Urazayev, Grzegorz Dworacki, Saule Iskakova

#### Institution

West Kazakhstan Marat Ospanov Medical University

#### Description EN

In this research thymus output by the level of concentration of T cell receptor excision circles in the peripheral blood mononuclear cells was investigated in patients with DM2 having received different kinds of therapy by in real time PCR method and by the content of thymus emigrants by expression of receptors to interleukin-7 (CD127 and CD132) in subpopulations T-lymphocytes by the method of flowing cytometry. Disturbance of thymic output in patients with DM2 was found and it was seen in decrease of concentration of T cell receptors excision circles in the peripheral blood mononuclear cells and mitigation of emigration CD127<sup>+</sup>CD132<sup>-</sup> in naïve T-cells, CD127<sup>+</sup>CD132<sup>-</sup> in CD8<sup>+</sup> T-cells and increase of emigration CD127<sup>+</sup>CD132<sup>-</sup> in CD4<sup>+</sup> of T-cellular population.

It was registered that treatment with metformin eradicated thymic output disturbed by DM by increasing concentration of T cell receptors excision circles in the peripheral blood mononuclear cells and positively influencing on the early populations of thymus emigrants, specially on the fractions CD127<sup>+</sup>CD132<sup>-</sup> naïve and CD127<sup>+</sup>CD132<sup>-</sup>CD4<sup>+</sup> of T-cells.

It found that patients with type 2 diabetes, the level of IL-7 is not dependent on the type of antidiabetic therapy.

Class no.

## Kyrgyzstan

**KG.1.**
**Title**
**Ceramic Material For The Manufacture Of The Facing Tiles**
**Authors**

S. Jekisheva

**Institution**
**Kyrgyz-Russian Slavonic University**
**Patent no.**

RU2387615

**Description EN**

The invention is related to the field of technology of silicates, and in particular to the compositions of the masses on the basis of the aluminosilicate ceramic used for the manufacture of facing tiles.

The aim of the invention is to expand raw materials in the manufacture of ceramic industry through the use of a new type of non-traditional materials, as well as raising, as mechanical strength so heat resistance of the ceramic material for construction purposes, to reduce its linear shrinkage and increase brightness.

The technical result of the invention is to increase the strength of aluminosilicate ceramic tiles, to reduce their linear shrinkage and increase brightness.

The solving problem of the invention is to get ceramic tiles with the use of refractory and fusible clay, quartz-sericite porcelain stone and vollastonit in the following ratio, the mass fraction in%: refractory clay - 20-40; fusible clay - 1,2-4,2 , skull (ground fighting products) - 0.5-2.0; quartz-sericite porcelain stone - 50-66; vollastonit - 16-21, which reduces the cost of products, reduces the shrinkage of the ceramic mass, and reduces the temperature of the burning of bricks.



**Korea**by  
**TISIAS****KR.1.****Title****Personal User-Friendly Custom Navigation****Authors**

SIWOO LEE

**Institution****Korea University****Patent no.**

N/A

**Description EN**

The present invention has personalized user-customized functions in consideration of overall traffic safety including special attention zones such as kids' school zones and potential accident-induced zones. In addition, the navigation is systemized so that it considers various driver habits and provides them with road and weather information to identify real-time road conditions while preoccupying to find realistic routes to take. The driver can select the route of his/her own preference and reduce the number of accidents caused by careless driving or bad driving habit through advantageous recommendations of route indicated by this customized navigation matched for the driver. For preference setting, the driver can select up to 3 user-rank settings, and 3 ranks are ranked from first priority to second and then third. In addition user settings, recommended routes can also be shared by mutual users of the navigation app helping to expand their own knowledge base of roads. The app also allows drivers to be aware of advanced information such as weather, road surface condition, and school hours which allows the driver to fully focus on driving only.



# Lebanon

by

*National Association for Science and Research, Lebanon*

## LB.1.

### Title

**The Runway Safety Clearing System**

### Authors

Mohammad Ali Bilal Dendachli

### Institution

**National Association for Science and Research, Lebanon**

### Patent

Patent application No. 11374/2018

### Description EN

The Runway Safety Clearing System clears the airports runway from any obstacle that may be found on the runway before any aircraft uses it, providing a safer runway for aircrafts. The system will be present at the beginning of the runway. Before 15 min of using the runway it is activated by the control tower, it starts moving forward emitting a sound which scares away any animal that might be found on the runway such as birds it also alerts any human that might be on the runway, but what if there was a nonliving obstacle on the runway. When the system locates any obstacle on the runway that shouldn't be on it, it will stop for around 15sec and send the location of the obstacle to the control tower thus alerting that an obstacle has been found, so the employee in the control tower will check the footage of the live streaming camera and act according to the obstacle, if it was a human or an animal then we will check by the camera if that obstacle exited the runway or not and if it was a nonliving obstacle then the employee will take a picture of that obstacle by the camera and send the picture and location to a team that will go to the runway to remove that obstacle before the aircraft arrives.

### Class

8



## Macao

### MO.1.

**Title**
**3D Magic Twisty Toy**
**Authors**

CHANG CHENG HEI

**Institution**

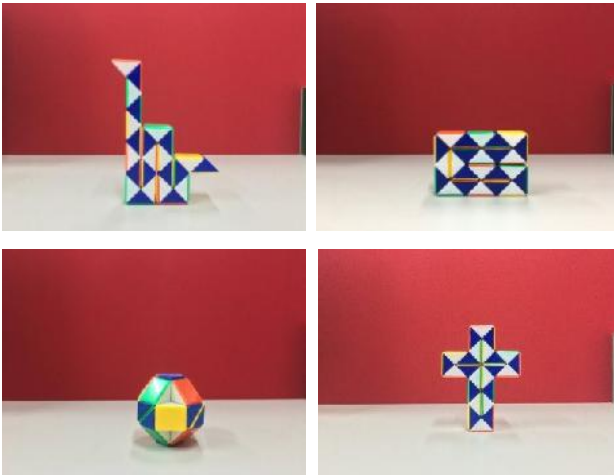
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**Description EN**

Traditionally, the combination toys are to stack or embed it, but it is not firm and it is easy to break by the external impact. Furthermore, it is not user-friendly. The user cannot twist it easily. Thus, the improvement is to use the fishing line to run through the toy, so that the user can twist it faster and enjoy the puzzle more. 3D Magic Twisty Toy is a high intelligence new toy, not only inspire the user's creativity of 3D models, also encourage the imagination and the observation from the process of playing puzzles. One 3D Magic Twisty Toy can be created into hundred kinds of different shapes such as bird, giraffe, duck, turtle, even an ostrich, basket and cross. Having more than 2, the models can be created more. Are you ready for the brainstorm?

Class no.

13



## Macedonia

### MK.1.

**Title**
**Biodegradable rayon from milk**
**Authors**

Stefani Petrova, Martina Taneva

**Institution**
**Yahya Kemal College**
**Description EN**

In our daily life we use essentials such as: plastic bags, glass bottles, Styrofoam cup, tin cans etc. We are able to replace some of the less environmentally friendly materials with those which degrade faster and we should raise the awareness of their importance. Scientists have invented a lot of new materials that have the same usage, but are biodegradable, which means they do not release toxic gases in order to be decomposed. We have become aware of the damage that the environment deals with, so our aim was to find an interesting, inexpensive and harmless way to produce *A BIODEGRADABLE RAYON FROM MILK*, because the casein in the milk contains pH (potential hydrogen ions) similar to the human skin which makes it suitable for clothing worn close to the skin like underwear, socks, dresses etc. Rayon is an artificial silk that can be made out of casein. This material takes part in the textile, medical and pharm-packaging industries. By reaction of cellulose, milk casein and acid we get viscose filaments, a soluble polymer that can be converted into RAYON. This process is useful because instead of using the main resource – wood pulp – it can be replaced with spoiled milk. Biodegradable rayon can also be produced by the usage of raw cellulose such as waste paper (unprinted), filter paper, cotton etc. After doing plenty of researches we concluded that the most favorable solution was to get this rayon by using the casein from milk in order to reduce the waste of spoiled milk, since tons of it is being thrown away. Thus it is highly recommended by doctors to wear such kind of clothing.

Class no.

3

**MK.2.**

**Title**

BIOSWALE - Green unraveling for saving the world from deluge

**Authors**

Mila Lazarova, Darian Janevski

**Institution**

**Yahya Kemal College, Karposh Skopje**

**Description EN**

As the hydro central potential is used more and more every day, a new perspective has been opened for us, and a thousand questions along with it. What if a big amount of water becomes a huge amount of water? What if one day, a huge amount of water forms and makes horrible consequences? We noticed that besides our benefits from the hydro centrals there is a much wider perspective we should look at and much more facts we should think about. We have tried to do something new. Instead of hoping for the best when there is a flood we thought of a solution that could absorb the water into the ground. The basic thing we want to do is review the possibilities and advantages. We found a way to make a difference that is both ecological and economical. This project will include detailed and extended information about what we already know. Besides that the project would satisfy the needs of the systems without doing any harm to the Earth. This project isn't only about gathering data and generating a hypothesis in a deductive and inductive way but also using the data to create a solution that we can benefit from. To sum it up, this economical project proves that we don't need much financial support to make a big change, but it can also be simple and cause a big effect.

The goal of our project is to save flooded areas (towns) and people's lives as much as possible. Our aim is to improve this ecological and eco-friendly idea that will be good for everyone. The benefit is that the absorbed water is not wasted and it is used to its maximum potential. We really hope that most of the countries will use this kind of solution to save people's lives and their homes.

Class no.



**MK.3.****Title****Effect of recrystallized hydrogels in biofuel****Authors**

Merve Sena Cengiz, Dren Kaliqi

**Institution****Yahya Kemal College Skopje****Description EN**

In the present work, we focused on the production of biodiesel (which is an important biofuel) from vegetable oils. With the conventional technology, vegetable oil mixed with alcohol (e.g., methanol) reacts in large-scale batch reactors and in the presence of an alkaline liquid catalyst (e.g., NaOH or KOH) to form methyl esters or biodiesel and glycerol or glycerine. Biodiesel is the name given to fuel for Diesel engines created by the chemical conversion of animal fats or vegetable oils. Pure vegetable oil works well as a fuel for Diesel engines itself, as Rudolf Diesel demonstrated in his engine at the 1900 world's fair with peanut oil as the fuel. However, vegetable oil is inherently viscous and cannot be burned efficiently at ambient temperatures in modern over-the-road vehicles. We made our project to form biodiesel from vegetable oil and to show the effect of recrystallized hydrogels in biofuel. We have obtained a more useful biofuel by getting different researches that would not harm our nature and we have also obtained a biofuel that will not harm for animals and plants. We have done different types of experiment for their project. In two months we research about their project and we have got an idea to try to get biofuel from powder egg-shells and peanut-shells. After making our experiment we calculated them with formulas and made their graphics. From this project we conclude that peanut shells are low cost effective water remover.

Class no.

3

**MK.4.****Title****Cleaning the dairy wastewater using citrus peels****Authors**

Snezhana Koleva, Ljubomir Kolev

**Institution****Yahya Kemal College****Description EN**

Lately, there have been a lot of serious problems with pollution. A lot of industries, including the milk industry, pollute the water around the urban areas. So, we need to find a way to tackle this problem which is getting bigger and bigger with time. We got the idea to produce biopolymeric flocculants that will not damage the environment. Firstly, we took the citrus peels, cut them in small pieces, dried them in an oven and boiled them for 2 hours. Then, we blended them until we got a fine powder which was cleaned again by sitting in 250 ml. water for 2 hours. After that, we measured the pH level of the pectin from the peels and according to that, we added 0.1M

## EUROINVENT 2019

HCl to decrease the pH level. Subsequently, we filtrated the mixture many times and at the end, we dried the pectin in an oven.

We took two types of dairy wastewater from a factory: one with acid and one without acid. Then we mixed the wastewater with the coagulant  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  for 3 minutes and after that, we mixed the mixture with the flocculant for 30 minutes. After the mixing, we let it stay for 30 minutes and during this time we saw the action of the flocculant. In the end, we filtered the mixture and took out the color of it with the simple process of condensation. With that, we obtained clean water from dairy wastewater.

Class no.

1

**MK.5.**

**Title**

**The effect of the aronia melanocarpa on the dust mite allergy**

**Authors**

**Jana Majnova Omar Kolashinac**

**Institution**

**Yahya Kemal College, Karposh Skopje**

An allergy is a hypersensitivity disorder of the immune system. When a person's immune system reacts to substances that are usually harmless in the environment, that person has an allergic reaction. The symptoms of an allergy ordinate from the activity of antigens and antibodies in the lymphatic system. Antigens react with these antibodies and trigger a sequence of events that produce allergy symptoms. Histamine and histamine like-substances are then produced causing the enlargement of capillaries and the contraction of smooth muscle. The enlargement of capillaries results in a flow of plasma from the blood to the intercellular fluid and the result is allergenic symptoms such as edema and high fever.

**Description EN**

One of the most common and most difficult to treat allergies is the one caused by dust mites. It is so difficult to treat because dust mites are all around us, in our beds, carpets, curtains and almost everywhere we look in our everyday environment. Signs of dust mite allergy include sneezing and runny nose. Many people with dust mite allergy also experience signs of asthma, such as wheezing and difficulty breathing. I myself have this allergy and know what kind of burden is to live with it. There are a lot of antihistamine pills and sprays just covering the symptoms but not actually making you any better. There are also some treatments including injections and putting drops underneath your thong both promising to make your immunity system better and partially cure you, but no one can guarantee their safety or how healthy they are.

Class no.

4

INTERNATIONAL EXHIBITS

**MK.6.****Title**

**Designing and Manufacturing, An Environmentally Friendly Novel Method For Polluted Air Purification**

**Authors**

Cavit Hasan Kreci, Beyza Ismail

**Institution**

**Private Yahya Kemal College Skopje**

**Description EN**

air pollution levels present in the air. The superiority of this project is that, we prioritize creating a feasible, reliable and environmentally friendly method to decrease the air pollution levels, without depleting any kind of food source but by the use of organic waste material. We chose corn cobs and sunflower disk florets as waste materials that could absorb the pollutants in the air, benefiting from their sponge like structures. The affectivity of this method was tested in laboratory field by applying different toxic (CO<sub>2</sub>, NO<sub>2</sub>, NH<sub>3</sub>) gases to corn cobs, sunflowers, corn cobs – sunflowers mixed, and recording the results with the mq-135 sensor accordingly. The results have proven the high efficiency pollutant absorbing properties of these materials, enabling them to be used as alternative low-cost and environmentally friendly waste bio materials.

The results from the conducted experiments indicated that corn cobs and sunflower disk florets do decrease different levels of toxic gasses. Most significant of them being: sunflowers sample decreasing 65.1% CO<sub>2</sub>; sunflowers sample decreasing 23.6% NO<sub>2</sub>; sunflowers – corn cobs mixed sample decreasing 44.3% NH<sub>3</sub>. The results demonstrated that, corn cobs and sunflower disk florets have both fundamental and complementary pollutant absorbing properties, consequently, indicating an overall of 35% decrease in air pollution levels.

These results proved our hypothesis that these waste materials are a great fit for absorbing pollutants present in the air and can be implemented in locations where harmful gasses are present for vulnerable groups, such as schools, hospitals, nursing homes etc.

Class no.

**MK.7.****Title**

**Zeolite - heavy metal hunter with soil and foliar feeding**

**Authors**

Dea Mulladauti, Kiril Ristevski

**Institution**

**Yahya Kemal College, Karposh Skopje**

**Description EN**

On planet Earth humans are the most complex organisms. During their existence they are exposed on different affections



by the environment and that reflects on their evolution. We should be aware of the polluted environment. It would be very useful if we could decrease the number of heavy metals that can be found in the soils in industrial areas all over the world because they present a big problem nowadays.

The main reason why we chose this project is because they have a bad influence on people's health and the environment, so we want to prevent that. One of the ways to get rid of them is by using the mineral Zeolite. **We chose Zeolite as a way of cleaning the soil because this mineral is economically available for everybody.** Our goal is to prove that soil which is contaminated with heavy metals can be revitalized by Zeolite and after that it can be used in growing vegetables. In the beginning we took soil samples from the highly contaminated industrial area of North Macedonia. Later the soil samples were examined and we confirmed that the soil was highly contaminated. In the experimental part we used Zeolite in 9 different concentrations of soil and foliar feeding with the same highly contaminated soil. We mixed the mineral with the soil samples and left them to react for two months. Meanwhile we planted wheat in bowls with and without zeolite for us to be able to notice the difference of the quantity of heavy metals in each bowl. After one month we had them tested separately using an atomic absorber ICP AES. The atomic absorber gave us the expected results.

Class no.

3

**MK.8.****Title***ANTI-ACNE CREAM***Authors**

David Goshevski

**Institution****Yahya Kemal College, Karposh Skopje****Description EN**

A big percentage of world population has some skin related problems, usually represented with itchiness, redness, inflammations, and acne. Inspired by the tradition in our region, I decided to make an anti-acne cream exclusively from natural ingredients. My main goal is to make a product that will help to treat various types of acne, without causing any side effects. The anti-acne medicine which I have developed, is prepared by using healing plants which are grown into the wild of the most famous eco-region in Macedonia called Malesevo.

The cream that is final outcome of this project is entirely natural. It does not contain preservatives, corrosive substances, corticosteroids and any other irritants. A survey with dozen volunteer patients, who are prone to acne, have been contacted together with a prominent doctor and pharmacist. After fourteen-day application of the cream, 80% of the patients (ten

patients), had visible skin improvements. While a month after the first application of our anti-acne cream, all the patients were fully healed. Their skin did not have pimples (acne) anymore, and the whole treatment prevented scar appearance.

Further step of this research project is to produce an anti-acne soap, which will be made up of natural essential oils and will give an antibacterial, antimycotic and healing effect on the skin. My idea is that the soap will be beneficial for disinfection of damaged and irritated skin on people with different kind of acne.

Class no.

4

**MK.9.**

**Title**

**Environment Friendly, Efficient and Sustainable Method of Cleaning Oil Spills using Fruit Peels**

**Authors**

Angela Busheska

**Institution**

**Private Yahya Kemal College Struga**

**Description EN**

The purpose of this project is to investigate a solution for the oil spills. Being intrigued by the events in Greece 2017, and the horrible consequences, I started researching why this was happening. The problem was that all of the previously found solutions caused horrible threats to the environment. After conducting the research I found out that fruit peels fulfill the wetting property which scientifically is the first condition for a successful adsorbent. The following step was concluding which peels are the most effective and we found out that the pomegranate is the main substance. I conducted 20 experiments with different ratio of fruit peels in three different water temperatures and types of water. The most effective in all situations was pomagranate:banana:apple:lemon:orange=1:1:1:1:1. Due to the research we found out that a successful solution for oil spills is: oleophilic, hydrophobic, eco-friendly, durable and efficient. We conducted three rounds of experiments. The first round experiments showed that sorbent of fresh biomass and nylon mesh is only oleophilic. The second showed that sorbent out of jute mesh and sundried biomass is oleophilic, hydrophobic, eco-friendly, but not durable and efficient. Of all rounds of experiments that we made, the third that used jute mesh, sundried biomass and mesh coating with beeswax

and epoxy adhesive as well as n-Hexane for washing the peels, completed all the requirements. Our solutions are adventegeous compared to the already existing ones because they are highly effective and there is no other damage.

Class no.

1

**MK.10.****Title**

Cleaning contaminated water with the biosorbents lemon and garlic

**Authors**

Andreja Popovik, Hikmet Rana Karacar

**Institution**

**Yahya Kemal College, Karposh Skopje**

**Description EN**

This study was conducted to investigate the effect of aqueous solution formed from Lemon (*Citrus limon* L.) and Garlic (*Allium sativum* L.) mixture and its ability of heavy metal absorption. Heavy metals that we used were : Cadmium (Cd), Chromium ( $\text{Na}_2\text{Cr}_2\text{O}_7$  ,  $\text{Na}_2\text{Cr}_2\text{O}_7$ ), Copper ( $\text{CuSO}_4$  ,  $\text{CuCl}$ ), Lead ( $\text{Pb}(\text{NO}_3)_2$ ,  $\text{Pb}(\text{NO}_3)_2$ ), Manganese ( $\text{KMnO}_4$ ), Aluminum ( $\text{KAl}(\text{SO}_4)_2$  ,  $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ ) from multi-component systems at different adsorbent/metal ion ratios. Different parameters such as amounts and absorption of heavy metals were evaluated. The influence of pH, contact time, temperature and the concentration of adsorbent and adsorbate were studied to optimize the conditions to be utilized on a commercial scale for the decontamination of effluents in a batch absorption technique. The optimum absorption was found to occur at contact time 16h, pH value 5.0, adsorbent dose from highest range from 99.81% for Cd (5% solution lemon-garlic) to lowest range to 28,60% for Mn (5% solution lemon-garlic). Although we didn't measured pH, it appeared that increasing the amount of lemon-garlic sorbent and increasing pH in polluted water the results of heavy metal absorption increased too, till some level of amount of absorbent, when started to decrease. Nevertheless, the results showed that this way of heavy metal absorption from wastewater, with the lemon-garlic sorbent, is useful, alternative method which indicated decreasing in any situation. The technique appears industrially applicable and viable.

Class no.

1

**MK.11.****Title**

*Development of ozone generator and use of ozone as a safe sterilization tool*

**Authors**

*Ana Marija Ilieva*

**Institution**

**Yahya Kemal College, Karposh Skopje**

**Description EN**

The main goal of this project was to develop an Ozone generator based on strong ionization discharging technology. For this purpose we have implemented Cockcroft–Walton Generator and succeed to produce about 7.000 volts DC. Electricity discharging through designed electrodes successfully generates Ozone in small quantities. In order to check Ozone's ability for sterilization/disinfection we conduct 4 different experiments were microbiological swab are taken from TV remote controller, Mobile phone, Paper money and dirty water. For all four experiments we used different time of ozonation, in order to find out what is the minimum time which guarantee full sterilization of the device sterilized. In all four experiments we show that Ozone can be successfully used in process of sterilization/disinfection. Ozone has great sterilization potential, especially in cases where low level temperature sterilization is needed. It has been used for many years in disinfection of drinking water. Ozone is relatively safe and its use is quite cheaper compared to the alternatives, such formaldehyde or hydrogen peroxide. We believe that in near future Ozone will became a viable alternative for low-temperature sterilization.

Class no.

2

**MK.12.****Title**

**Energy efficient way of producing lettuces with Hydroponics**

**Authors**

AnaMarija Ilieva, Anja Davitkovska

**Institution**

Yahya Kemal College, Skopje, Republic of MACEDONIA

**Description EN**

In this project we have designed and developed a soilless system for plant cultivation through technology known

INTERNATIONAL EXHIBITS

## EUROINVENT 2019

as Hydroponics. We succeed to fully grow 35 plants of lettuce. Due to the possibility of plant replacement during the whole growing process, we succeed to obtain much higher utilization of space which was only 0.48% compared to the traditional growing in first 11 days, 3% between 12<sup>th</sup> and 18<sup>th</sup> day, 6% between 19<sup>th</sup> and 28<sup>th</sup> day and only 12% between 29<sup>th</sup> and 40<sup>th</sup> day of the experiment. With the same percentage was utilization of heating energy, lightning and especially water supply, which is only 5 % compared to the traditional growing systems. Also, production cycles were much shorter and obtained food is without any pesticide. This technology is fully ecological and we believe that will become more and more important in the near future.

Class no.

2,3

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### MK.13.

**Title**

**Shading Venn Diagram with Graph**

**Authors**

Jusuf Xheladini

**Institution**

**Yahya Kemal College Tetovo**

**Description EN**

Shading Venn Diagrams With Graphs is a pictorial representation of the relationships that are found between sets such as union, intersection, difference, and so on. We have used inequalities to shade the requested region which are also represented by set notations. This project shows a mathematical way for this shading process. Only by looking at the inequalities, one can figure out which region is wanted, without the necessity for visual drawings. We have concluded that shading Venn diagrams through our processes is a mathematical process that can be used for digital learning to enhance logical thinking. Last but not least, we have also discovered a formula which shows the maximum number of individual areas that can be shaded formed by n-number of intersecting Venn diagrams.

Class no.

14

**MK.14.**

**Title**  
**Authors**  
**Institution**

PIDORE - a healthier solution to body odor -  
**Filip Veselinov, Elena Cvetanoska**  
**Yahya Kemal College, Tetovo, Macedonia**

**Description EN**

Our goal was to create a deodorant that is organic and different from all deodorants available on the market. With PIDORE we managed to make it a reality.  
 We started our project by exploring deodorants and their chemical structure. After this we continued digging to find the side effects of these components to our organism and to our environment. We did research about alternative ingredients that would have same or similar antimicrobial effects as the ones in deodorants but organic and natural. We found several substitutes that were effective but combined with each other they had unexpected chemical reactions that led them to lose their efficiency. With combining and changing between ingredients, we successfully found a match that had the required efficiency. After that we proceeded to improve smell of the product. We continued to experiment until we found our final solution.  
 In this solution we used acetic acid, lemon peel extract, 70% ethanol and povidone iodine..  
 We named this solution PIDORE.

Class no.

**MK.15.**

**Title**  
**Authors**  
**Institution**

Mixing LDPE and HDPE with naked corn cobs  
**Filip Veselinov, Elena Cvetanoska**  
**Yahya Kemal College, Tetovo**

**Description EN**

Our goal was to find a useful and creative contemporary solution for the massive deforestation that is happening around the world. To get to the final answer, we first started to get into the problem to try to find why are trees so important to so many industries and what are they used for. By understanding what the industry needed we could work around it to create something that would help the environment, without affecting the industry. After this we continued doing research about what could we do to reduce deforestation. We experimented until we found the perfect ingredients and

the perfect ratio between them. We also experimented with the usefulness of our product. The experimentation went on until we got the final solution-TENA

Class no.

1

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**MK.16.**

**Title**

**“Young Brains Use the Grey Wastewater as a Cleaning Agent for Oil-contaminated Water!”**

**Authors**

Teodora Lozhankoska, Beaza Kadrioska

**Institution**

**Yahya Kemal College Struga**

**Description EN**

There is a water crisis today but on the other hand many waters are polluted with enormous amounts of oil spills. But the crisis is not about having too little water to satisfy our needs. It is a crisis of managing water so badly that billions of people and the environment suffer badly.

That’s why in our work we try to give our contribution for a better Earth by developing relatively inexpensive and productive methods on how to save and clean water i.e. on how to save life and energy

Class

1

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**MK.17.**

**Title**

**LCD Projector**

**Authors**

Artiot Xhabiri

**Institution**

**Yahya Kemal College TETOVO**

**Description EN**

LCD Projector built of readily available parts, able to reach a resolution of 2K or more depending on the LCD, for the fraction of the price of commercial projectors. Can be mass manufactured or easily sold as DIY kit. The main functional parts are the LED light source, the LCD and lenses. Also it can be easily scaled up or scaled down for personal preferences. The main input is via HDMI but it can be changed to VGA or other necessary inputs, there is a possibility to set it up as android so you can use it over Wi-Fi as a normal android device with the help of a remote or software. Overall it is an easy build and a great idea which can replace conventional projectors by offering cheaper price and higher projection quality.

Class no.

10

## Malaysia

Represented by Malaysian Research & Innovation Society (MyRIS) &  
University Malaysia Perlis

### MY.1.

#### Title

**Eco-Geopipe: Glass Reinforced Epoxy Filled Geo-Filler For Piping Application**

#### Authors

Mohammad Firdaus Abu Hashim, Mohd Mustafa Al-Bakri Abdullah, Che Mohd Ruzaidi Ghazali, Kamarudin Hussin, Yusrina Mat Daud, Hasri M. Si, Hartati S. Si

#### Institution

**Center of Excellence Geopolymer & Green Technology/Faculty of Engineering Technology/Universiti Malaysia Perlis**

#### Patent no.

US 8,337,612 B2 / PI 2014701034 / PI 2014702066

#### Description EN

Eco-Geopipe: A Novel Glass Reinforced Epoxy (GRE) filled geo-filler pipe offers renewable of geopolymeric materials as filler in plastic piping application for residential, commercial and industrial structures. The existing GRE pipes for piping application nowadays have some problems and disadvantages such as issue to high mechanical loads, performance and stability of GRE pipes may be sensitive to damage suffered by poor handling and installation practices. This new form of piping materials filled geopolymer materials with cement characteristics proposed several economic benefit, durability, good mechanical properties, less water absorption, and fire and heat resistance. However, the geopolymer materials such as fly ash, white clay, and pozollonite are found to have a good prospective to use as filler in composite field. Thus, the novel of GRE filled geopolymeric materials piping was prepared to meet desired application.

#### Class no.

7





**MY.2.****Title****Novel Paddy Straw Clay (PADS-CLAY)****Authors**

Panji Alam Innovatioan Lab (PiLab)

**Institution****SEKOLAH MENENGAH PANJI ALAM KUALA TERENGGANU, TERENGGANU. MALAYSIA****Patent no.**

-

**Description EN**

Novel Paddy Straw Clay (PADS-CLAY) water filter was successfully developed using a simple dry/wet phase process. The PADS-CLAY water filter is a ceramic based product designed and developed by PiLAB@SMKPA. Using of natural agricultural bio-waste material, special bio-waste active compounds (BWA) from paddy straw was produced via dry method. With an excellent properties, a special formulation comprises of Clay/Additive/BWA was designed and formulated. In the formulations, special blends of different materials produced unique properties of PADS-CLAY filters. In addition, the PADS-CLAY ceramic filters possess of fine active surface and good porosity features which are the vital properties of water filters for drinking water. Moreover, the fabricated low cost, even and fine active porous ceramic produced via dry/wet phase process made the PADS-CLAY filters are highly versatile in the characteristics and separation capability. Moreover, the novel PADS-CLAY filters having micro and macropores and fine structures promoted towards high productivity and selectivity converted of raw water into a fresh drinking water for community. Significantly, the novel hand-made PADS-CLAY filters is found to be highly potential as a green and economic process for high impact industries such as wastewater treatment, food processing and biotechnology.

**Novelty:** The novel PADS-CLAY water filters designed from bio-waste materials is the pioneering work in Malaysia. Special formulations comprises of local clay, additive and agricultural bio-waste active compound produced a unique green and low cost PADS-CLAY ceramic water filters with a good porosity and fine selectivity for the production of fresh drinking water for community.

**Class no.**

1. Environment – Pollution Control

**MY.3.**

**Title**

**Urban Planting Kit From Recycle Material To Enhance Green Environment**

**Authors**

Mohd Rosnizam Bin Mohd Yusoff/Farisa Soleha Binti Mohd Arfa'a/Muhasabah Binti Mohad Shukri/Muhammad Aiman Bin Md. Ishak

**Institution**

**Kolej Vokasional (Pertanian) Teluk Intan, Perak, Malaysia**

**Patent no.**

Patent application No.

**Description EN**

UR PLANTING KIT is a creative innovation in facilitating urban agriculture concept. UR PLANTING KIT does not require extensive work space, or complicated equipments. This innovation turns recycled waste products into something very useful. Waste materials such as plastic mineral water bottles of, plastic containers, newspapers and agricultural wastes are used to produce this innovation. UR PLANTING KIT plastic bottles and plastic containers functional as a structure holding medium, water and crops. UR PLANTING KIT unique medium that is composed of a treated newspapers in fertilizers solution and rice husks to maintain quality and provide texture suitable for planting. This medium contains 16 elements; namely C, H, O, N, P, K, Ca, Mg, S, Zn, C, Fe, Mn, B, Mo and CL. Circumcised at medium water as a source of water supply show reading EC 26 and pH 6.5. The crops planted will be very healthy, qualified and have esthathic value as a decoration in the home or office.

It is hoped that UR PLANTING KIT innovation will change our urban community perception in planting, and will make agriculture a way of life to enhance green environment.

Class no.

3. Agriculture and Food Industry



**MY.4.**

**Title** **OPMAT-Organic Planting Mats To Prevent Soil Erosion**  
**Authors** Mohd Rosnizam Bin Mohd Yusoff/Farisa Soleha Binti Mohd Arfa'a/Muhasabah Binti Mohad Shukri/Muhammad Aiman Bin Md. Ishak  
**Institution** **Kolej Vokasional (Pertanian) Teluk Intan, Perak, Malaysia**

**Patent no.** Patent application No. **2018009501/2018**

**Description  
EN**

Erosion is understood as the destruction of the earth by agents which can also transport the material destroyed. Water is a very dangerous example of erosion by water agency and defined as water erosion. Water will not only dissolve and escape malnutrition but also scrape away the soil grain. The loss of this fertile ground that will cause problems in agriculture.

OpMAT was produced from banana tree trunks (*Musa sp.*), ferns (*Limnocharis flava*) and weeds (*Imperata cylindrica*). This 2 layer mats are also enriched with tannins, flavonoids, alkaloids, triterpenoids, steroids, resin, saponin and indulole butyric acid from *termanilia cattapa* and willow (*Salix babylonica*). These elementary band very effective for cultivation, prevent the growth of weeds, fungi and encourage root growth. The top layer is smooth and dense will protect and preserve moisture grass seed while the lower layers of the tape is a bit loose and hollow will facilitate root growth and penetration into the ground.

OpMAT mats is suitable for use with all types of lawn grass either from seeds, cuttings, runner or division of clumps. Through tests conducted in laboratories Felcra Plantation Services Sdn. Bhd, Perak, the value of N(1.25%), P(0.70%), K(1.40%) is obtained, there is also a high value of indulole butyric acid and tannin detected on this mats. Planting Test are conducted using *bracharia decumbens* grass, *Vetiveria zizanioides* grass, Carpetgrass (*Axonopus*) and legumes also provide very encouraging results with a growth rate of 75% in a short time.

Class no.

4



**MY.5.****Title****e-LIPS – Organic Livestock System****Authors**

Mohd Rosnizam Bin Mohd Yusoff/Farisa Soleha Binti Mohd Arfa'a/Muhasabah Binti Mohad Shukri/Muhammad Aiman Bin Md. Ishak

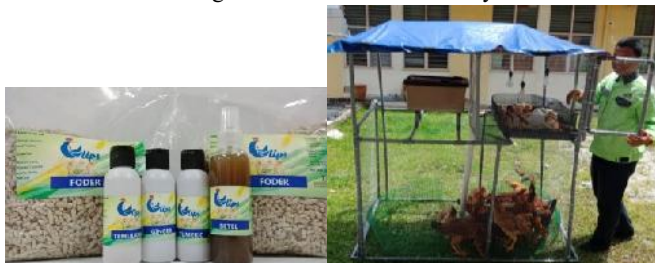
**Institution****Kolej Vokasional (Pertanian) Teluk Intan, Perak, Malaysia****Patent no.**Patent application No. **2018009502/2018****Description  
EN**

e-LIPS is an organic chicken system that includes smart structures, fodder and supplementary foods such as vaccine and antibiotic. The unique of this system is, it applies an ellipse design to ensure the movement of the chicken actively. This smart system comes with Black Soldier Fly (BSF) as a natural food source, silo fodder, temperature sensors and automatic heating. It is portable because it uses PVC pipe which can be installed and opened. Foder food for this system is produced from banana stems and fermented grass with molasses, grains of rice, salt and bacteria to supply nutrients to livestock. While for supplements it also serves to treat and prevent disease. These foods are derived from turmeric, temulawak, ginger, semambu and betel fermented with coconut water separately.

Nutritional value test from Universiti Putra Malaysia Laboratory showed that chicken meat produced using this system has higher protein content and low fat compared to commercial system. The cost of farming is reduced by 50% and the death rate is also lower to 1%. The Food Conversion Ratios (NPM) data also show good rates with an average of 1 to 2 with 1kg of intake of food.

**Class no.**

3. Agriculture And Food Industry



**MY.6.**

---

<b>Title</b>	<b>GeoGrout™ –Towards Green Construction Materials</b>
<b>Authors</b>	Mohd Mustafa Al Bakri Abdullah, Warid Wazien Ahmad Zailani, Muhammad Faheem Mohd Tahir, Mohd Remy Rozainy Mohd Arif Zainol, Rafiza Abdul Razak, Liyana Ahmad Sofri, Subaer M.Phil, Ph.D
<b>Institution</b>	<b>Center of Excellence Geopolymer &amp; Green Technology (CEGeoGTech), School of Materials Engineering, Universiti Malaysia Perlis (UniMAP).</b>
<b>Patent no.</b>	MY 148054 A / US 8337612 B2
<b>Description EN</b>	Introducing GeoGrout™, geopolymer based concrete repairing materials with DIY concept. This product using advanced geopolymer technology with greener materials to overcome various concrete damage and problems. (max 250 words)
<b>Class no.</b>	7

# Mexico

**MX.1.**

**Title**

**HARVESTT: A GREENHOUSE WITH AI**

**Authors**

Emmanuel Campos Genaro

**Institution**

**General Systech LABS –Instituto Politecnico Nacional**

**Patent no.**

Patent in process

**Description EN**

HARVESTT is an agrotechnological system, which implements innovations in cultivation techniques, integrating technological mechanisms that can increase the development and growth of plants, revolutionizing classical agronomy, this poses smart greenhouse and germinator that through certain humidity, temperature and photoperiod controls It serves to test, analyze and carry germination under optimal conditions. In addition to having specialized software for a deeper study, adding concepts of fuzzy logic for prediction and mathematical analysis for mass crops, such as allowing the development of plants in urban communities taking into consideration the precautions and recommendations that are indispensable in science of agronomy.

**Class no.**

2,3



**MX.2.**

<b>Title</b>	<b>BeVolt</b>
<b>Authors</b>	Emmanuel Campos Genaro, Jose Israel Romero Flores
<b>Institution</b>	<b>General Systech LABS –Instituto Politecnico Nacional,</b>
<b>Patent no.</b>	-
<b>Description EN</b>	<p>Be Volt is a highly efficient bicycle generator and rechargeable battery pack</p> <p>Designed to power virtually any of your electronic or mobile devices via USB. Our generators easily mount on most standard bicycle frames and the battery packs detach easily to quickly extend your battery life.</p> <p>It is specifically designed and built to convert the movement of the bike's wheels into electricity. It can be used for the lighting system of the bicycle, to charge the battery of the mobile and, best of all, to charge its own internal and removable battery.</p> <p>Bevolt's proposal is to give the user the possibility of exercising at the same time as generating electricity, currently there are spinning centers, we want to take advantage of all that mechanical energy to convert it into electrical energy</p>
<b>Class no.</b>	1,2,13

**Morocco**

Represented by OFEED

**MA.1.****Title****Smartraffic****Authors**

Brahim El Bhiri, Adil SALBI, Maryam Lfkih

**Institution****EMSI Group****Patent no.****45633**

The SmarTraffic is a decentralized system based on the radio frequency identification and the image processing. It identifies vehicles that are in the state of emergency (VVIP, firefighters, ambulance, police ...) and controls the traffic light in a dynamic manner. If it is an urgent case (rescue of a critical case), an exchange of information is carried out for the control of the PLC that controls the traffic light (green light). The camera and by using our algorithms of image processing we compute the traffic and controls dynamically the duration of the traffic light.

**Description EN**

Class no.

10

**MA.2.****Title****Smarty Factory 4.0****Authors**

Oussama Rholam, Mohamed Tabaa, Brahim Chouri, Safa Saadaoui

**Institution****EMSI Group****Patent no.****44914**

This invention concerns a multi-interface, multiprotocol industrial communication device (Gateway) that allows data to be acquired in the form of Modbus frames and analog/digital inputs oriented by instructions configured through the TFT interface. It process the data received from equipment linked to the type of ModBus (RTU, ASCII, TCP/IP) configured, in order to convert adapt and transmit the frame to the chosen wireless solution whether it Zigbee, LORA, WiFi, Bluetooth, NB-IoT depending on the operating area and range.

**Description EN**

Class no.

10



## Moldova

### Botanical Garden of Academy of Science Republic Moldova

#### MD.1.

#### Title

**Implementation of innovative technology for cultivation and use of some non-traditional forage crops**

#### Authors

**Victor ȚÎȚEI, Alexandru TELEUȚĂ**

#### Institution

“Alexandru Ciobotaru” National Botanical Garden

Patent 209/2016.05.31

#### Patent no.

Patent application No. 20170018/2017.09.14

17.80015.5007.220T

#### Description EN

The development of the animal husbandry sector requires diversification and increased production of vegetal feed, balanced in terms of quantity and quality throughout the year, according to the physiological needs of animals and their productivity indices. The foundation of industrial plantations and the production of fresh and persevered feed (silage, haylage) in plastic tunnels, using cultivars of new and non-traditional forage plants created in the National Botanical Garden (Institute), Chisinau, Republic of Moldova: cv. *Speranța* of fodder galega *Galega orientalis* Lam., cv. *Vital* of cup plant *Silphium perfoliatum* L., and cv. *Argentina* of perennial sorghum *Sorghum almum* Parodi, will ensure an annual productivity of 10-24 t/ha nutritive units and 1576-2618 kg/ha digestible protein, during 8-15 years. The obtained preserved feed, according to organoleptic characteristics (smell, colour and consistency) and biochemical indices (pH, content of organic acids and their correlation, nutrient composition), meets the standards and can be used as feedstuff. The implementation of these innovative technologies will help maintain the animal welfare, ensure national food security and sustainability in terms of reducing the import of food, improving the environmental situation, making use of degraded and eroded soils and unused land in traditional agriculture, creating new jobs in rural areas.

#### Class no.

3

## The Institute of Physiology and Sanocreatology

<b>MD.2.</b>	
<b>Title</b>	<b>Artificial vagina for semen collection from male rabbits</b>
<b>Authors</b>	<b>Mereuță Ion, Boronciuc Gheorghe, Balan Ion, Cazacov Iulia, Buzan Vladimir, Roșca Nicolae, Bucarcuic Melania.</b>
<b>Institution</b>	<b>The Institute of Physiology and Sanocreatology</b>
<b>Patent no.</b>	<b>Patent 1259 MD</b>
<b>Description</b> <b>EN</b>	The invention relates to biotechnology, in particular to artificial insemination of animals. The artificial vagina for semen collection from male rabbits comprises a cylindrical body, at the ends of which is made a hole of different sizes, the upper one with a smaller diameter, and the lower one with a larger diameter, a cylindrical piece with a conical bottom, placed coaxially to the body in the hole with a smaller diameter with the possibility of fixation by rotation into the fixation point, at the same time in the upper part of the piece is made a seminal receptacle fixation hole, an elastic tube placed inside the body, forming a cylindrical cavity, made with the possibility of filling with water, at the same time on the upper part of the piece is made an annular projection for fixing one end of the elastic tube, and the other end of the elastic tube is made with the possibility of fixation by means of a garrot to the lower part of the body.
<b>Class no.</b>	<b>3</b>
<b>MD.3.</b>	
<b>Title</b>	<b>Process for producing proteincarbohydrate food for bee families</b>
<b>Authors</b>	<b>Vrabie Valeria, Derjanschi Valeriu, Ciochină Valentina, Furdui Teodor.</b>
<b>Institution</b>	<b>The Institute of Physiology and Sanocreatology</b>
<b>Patent no.</b>	<b>Patent 1312 MD</b>
<b>Description</b> <b>EN</b>	The invention relates to beekeeping and can be used for producing protein-carbohydrate food for bee colonies during periods of the year with pollen deficiency in nature. According to the invention, the process for producing protein-carbohydrate food for bee colonies, namely honey, consists in that it is administered in the period between the ending of the acacia honey harvesting and the beginning of lime honey harvesting, a mixture containing whey and sugar, in a mass ratio of 1:1, 3...5 L per colony in the evening, daily, for 10...15 days and is extracted the honey on the 5th...7th day from the last administration of the mixture.
<b>Class no.</b>	<b>3</b>

**MD.4.**

<b>Title</b>	<b>New Natural Balsams</b>
<b>Authors</b>	<b>Mereuță Ion, Carauș Vladimir, Morar Aurel, Cicalchin Serghei</b>
<b>Institution</b>	<b>The Institute of Physiology and Sanocreatology</b>
<b>Patent no.</b>	<b>S20190010 2019 02 12, S20190011 2019 02 12, S20190012 2019 02 12, S20190013 2019 02 12, S20190014 2019 02 12.</b>
<b>Description</b>	The inventions refers to the nourishment industry and the prophylactic medicine and can be applied to the warned of diseases, inclusively oncological one. The adaptability of ingredients contained in the composition for the obtaining of the prophylactic-curative balm improves the capacity of work, increases the resistance in the organism at the impact of the environment as at the toxic action of the polluting substances, has radioprotection, antioxidant, antistress properties, improves cerebral microcirculation and prevents senility, improves sexual activity, increase libido and fertility.
<b>EN</b>	
<b>Class no.</b>	<b>3</b>

## Technical University of Moldova

### MD.5.

#### Title

**DRYING PLANT FOR FRUIT AND VEGETABLES**

#### Authors

Bernic Mircea, Țislinscaia Natalia, Balan Mihail, Vișanu Vitali, Melenciuc Mihail

#### Institution

**Technical University of Moldova**

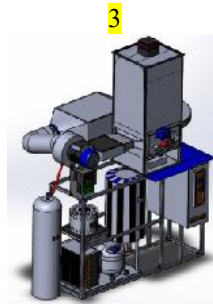
#### Patent no.

MD 1295 Y 2018.12.31

#### Description EN

The invention relates to the food industry, in particular to a drying plant for fruits and vegetables by applying three drying methods: convection drying, microwave application drying and CO<sub>2</sub> drying using microwave application, convection application or combining them . According to the invention, the drying plant for fruits and vegetables consists of: a housing on which the drying chamber to which a heat generator is mounted, and a centrifugal fan coupled to an electric motor, to which is connected an inverter ; a recycling channel is also connected to the drying chamber, which is adjusted to a condenser, which is connected with a centrifugal fan through an intermediate channel, which is provided with a nozzle; the microwave generator is mounted on the drying chamber and at the bottom there is the intermediate chamber in which a weighing machine is placed; a lid on which a CO<sub>2</sub> indicator and a CO<sub>2</sub> receiver are placed is also mounted in the lower part of the drying chamber; In the lower part of the installation, a processor for directing the microwave generator, a refrigeration plant, for directing the condenser via a pipe, is mounted in the housing; and a resistor for directing the heat generator; at the same time the plant is equipped with a CO<sub>2</sub> tank, which allows its supply via a hose.

Class no.



**MD.6.**

<b>Title</b>	<b>Process for bleaching nuts <i>Juglans regia</i> L.</b>
<b>Authors</b>	<b>Ciumac Jorj, Reșitca Vladislav, Macari Artur, Boaghi Eugenia</b>
<b>Institution</b>	<b>Technical University of Moldova</b>
<b>Patent no.</b>	1251
<b>Description</b> EN	The invention relates to the food industry, in particular to a process for bleaching nuts <i>Juglans regia</i> L. The process, according to the invention, comprises cleansing the nuts of the mesocarp, washing with drinking water, immersing the nuts in 1...5% sodium perborate solution with a temperature of 20...60°C, in a ratio of 1: 4, respectively, for 10...30 min, with periodic stirring and drying to a humidity of 8%..
<b>Class no.</b>	3

**MD.7.**

<b>Title</b>	<b>The laboratory platform for achieving the positioning of the satellite in the orbital magnetic field</b>
<b>Authors</b>	Ilco Valentin, Melnic Vladimir, Secieru Nicolae, Bostan Viorel, Bostan Ion.
<b>Institution</b>	Technical University of Moldova, National Space Technologies Center
<b>Patent no.</b>	-
<b>Description</b> EN	<p>The research/testing of nano-microsatellite attitudes with simulation satellite attitude in orbital conditions is a current issue, especially for nanosatellites, the attitude control of which is done with reaction wheels and magnetorquers. The proposed installation includes 2 simulators:</p> <ul style="list-style-type: none"> <li>- for experimental research in laboratory the kinematic and dynamic of nano-microsatellites with spherical space movement with a fixed point;</li> <li>- for experimental research of the dynamic attitude of the satellite in the simulated geomagnetic field.</li> </ul> <p>The simulator of research a kinematics of nano-microsatellite with a fixed-point spherical space motion reproduces the rotation of the satellite around 3 axes of the orbital reference system.</p> <p>It also allows experimental research on the intervention of the onboard systems on the orientation of nano-microsatellites in orbit, including the determination and calibration of the physical intervention efforts developed by</p>

the two board systems on the stability and the dynamics of the positioning of the nano-microsatellite on the axes of the coordinate orbital system. The simulator allows the experimental research of nano-microsatellite in laboratory and vacuum conditions.

The simulator of geomagnetic field for computerized testing of various equipment. It features a 1.4 m section in a chamber designed to calibrate the magnetic properties of the sensors to test the nanosatellite attitude control, as well as for other areas.

The simulator is able to reproduce the power and direction of the geomagnetic field measured anywhere in orbit. The magnetic fields generated by the simulator will be varied by modulation of the current in the Helmholtz coils so that we can test the entire magnetic intensity range, which could be encountered anywhere in the orbit.

Both simulators work under the command of the computing system, which requires the generation of similar conditions in orbit, including the magnetic field or the dynamic field of certain direction and intensity.

Class no.

5



**MD.8.**

**Title**

**Aeolian turbine with Vertical Axle**

**Authors**

Bostan Ion; Bostan Viorel; Dulgheru Valeriu, Ciobanu Oleg; Ciobanu Radu; Guțu Marin; Rabei Ion ; Gradiș Vitalie; Odainâi Valeriu

**Institution**

**Technical University of Moldova**

**Patent no.**

Patent MD nr. 1261 Y, 30.06.2018

**Description**

The wind turbine includes a three-bladed vertical-axis rotor with asymmetrical aerodynamic profile. To increase the efficiency of conversion of wind energy, the blades are helical and adjustable. The turbine rotor is connected to the rotor of the electric generator with permanent magnets.

**EN**

Class no.

2. Energy and sustainable development.

**MD.9.****Title**

Intelligent cleaning system for photovoltaic panels.

**Authors**

*Bostan Ion; Dulgheru Valeriu; Dumitrescu C., Cristescu C., Blejan M., Dumitrescu L., Ciobanu R..*

**Institution**

**Technical University of Moldova**

**Patent no.**

Patent application (RO) No. A/00580. 10.08.2018.

**Description  
EN**

The intelligent photovoltaic panel cleaning system includes at least one solar line with photovoltaic panels, a cleaning module driven in motion by a piezoconverter, brush node, anionic node, cationic node, impurity collector, efficiency sensors conversion of photovoltaic panels to different states of contamination, control block. The system works in the following way. At the signal from the sensors the control node acts on the piezoconverter, which puts the translation module into motion. As a result, the brush node destroys the solidified layer of impurities, the anionic node ionizes the particles of impurities and the cationic node catches them, then discharges them to the end of the solar line in a sack by switching the current to the cationic node from the sense (+) in the sense (-).

**Class no.**

2. Energy and sustainable development.

**MD.10.****Title**

**Mayonnaise - type food emulsions with high biological value**

**Authors**

Tatiana CAPCANARI, Cristina POPOVICI, Daniela PALADI

**Institution**

**Technical University of Moldova**

**Patent no.**

-

**Description  
EN**

Current research is devoted to develop technology of obtaining food emulsions such as mayonnaise from vegetable oils of the sunflower and grape seed with a high biological value. This research aimed to determine optimum extraction condition of parsley and lovage extracts and to

## EUROINVENT 2019

determine their application as an antioxidant in grape seed oil enriched mayonnaise. Sunflower oil was partially substituted by grape seed oil at level of 20%. The mayonnaise without grape seed oil and plant extracts was used as a control experiment. ISO (Official Methods of Analysis of AOAC International) standard methods of analysis have been applied for evaluation of mayonnaise emulsion.

During this experiment, physicochemical, basic quality properties as well as microstructure and rheological behavior in terms of storage and sensory evaluation of mayonnaises was performed. The results demonstrated that mayonnaises substituted with grape seed oil and added parsley and lovage extracts were acceptable. This study shows good potential for plant extracts and grape seed oil to be used as ingredients for mayonnaise with functional properties.

The elaboration of the technology of obtaining food emulsions such as mayonnaise from vegetable oils of the sunflower and grape seed with a high biological value, confirmed by the patent № MD-317, "Mayonnaise".

Class no.

### MD.11.

#### Title

**Engineering Book Edition for children with augmented reality**

#### Authors

Tatiana BAICEV, Viorica CAZAC

#### Institution

**Technical University of Moldova, Design and printing technologies**

#### Patent no.

-

#### Description EN

The edition conceived in this project is predestined for children aged 6-7 years, focusing on the knowledge of engineering for children. Facilitating children's knowledge of engineering is provided by augmented reality images that make it possible to visualize engineering products in 3D with the ability to visualize them from within. Objects and their components are multidimensional, which improves understanding of the things studied. The interest in such a book edition will also be ensured by the involvement of the electronic devices that have become indispensable, useful, interesting and interactive.

Class no.

3, 4.



**MD.12.**

<b>Title</b>	<b>Cognitive-interactive book edition for small children with integrated dynamic elements</b>
<b>Authors</b>	Ilinca STRILCIUC, Viorica CAZAC
<b>Institution</b>	<b>Technical University of Moldova, Design and printing technologies</b>
<b>Patent no.</b>	-
<b>Description</b> EN	The drafting presents a cognitive-interactive book edition for young children (up to 3 years) considering psycho-pedagogical recommendations at the international editorial level. The edition provides the knowledge of the environment through interactive dynamic elements that will help us discover, but also involve the child and develop his/her search and motor development skills. The aesthetic solution of the edition complies with the exigencies imposed on these products: synthesized images, chromatic fidelity, avoidance of small elements, lack of multitude of small elements, for easy and integral visual perception of the image.
Class no.	B60K 16/00, F24J 2/54

**MD.13**

<b>Title</b>	<b>Ensuring the contextual and plastic depth of photographic reproduction using golden hour</b>
<b>Authors</b>	Igor VLAS, Viorica CAZAC
<b>Institution</b>	<b>Technical University of Moldova Design and printing technologies</b>
<b>Patent no.</b>	-
<b>Description</b> EN	The elaborated methodology, to ensure the contextual and plastic depth of photographic reproduction, focuses on the use of golden hour. In the so-called "golden hours of moments", it can capture and process photographic images respectively, in which the contextual and energetic states of the composition give the image profoundness, valorisation of the image, valorisation of the state of mind, the shaping of the forms, the clear-obscure, the contours and volumes of the compositional elements, natural fidelity of the captured image, sensitivity, originality and unrepeatability of the moment.
Class no.	11

**MD.14.****Title**

**Photographic images with reflexive-optical visual effects derived from textured accessories and different opacities**

**Authors**

Igor VLAS, Viorica CAZAC

**Institution**

**Technical University of Moldova  
Design and printing technologies**

**Description  
EN**

The developed technology involves capturing photographic images, while creating reflexive-optical visual effects with textured accessories and different opacities. These effects make special, non-conformist, personalized, photographic images, integrated with new technologies and materials, making them stand out from traditional patterns. This technology allows the reflexive chromatic diversification of captured images, the dimensional diversity of compositional elements, the compositional diversification of photographs, the use of lights, shadows, halftones based on natural photographs.

**Class no.**

11

**MD.15.****Title**

**Contextual labels for wines produced in the Republic of Moldova**

**Institution**

Marin CUCERENCU, Viorica CAZAC

**Patent no.**

**Technical University of Moldova  
Design and printing technologies**

**Description  
EN**

The elaboration denotes contextual trade concepts of labels for wines produced in the Republic of Moldova.

The labels present the results of the contextual graphical searches, each label presenting the wine center story, the integration of the geographical agri-food particularities, the product qualities, the stylistic identity of the producer, the national identity, the association of the product with the recommended food, the stylist identity of the graphic designer, the ethnography and autochthonous , the possibilities of using the figurative and non-figurative identified from the medium or abstract.

All of this was considered in the correlation: product-material-environment-user. Another interface of the analysis for designing and materializing wine labels has been the analysis of printing, reproduction and finishing technologies that ensure product attractiveness through the label using various finishing materials.

**MD.16.****Title**

**Device for vibration smoothing by diamond of outer surfaces of cylindrical parts**

**Authors**

*Botez Ilie; Botez Alexei; Ciobanu Radu; Ciobanu Oleg.*

**Institution**

**Technical University of Moldova**

**Patent no.**

*Patent MD nr. 1254 Y, 31.05.2018*

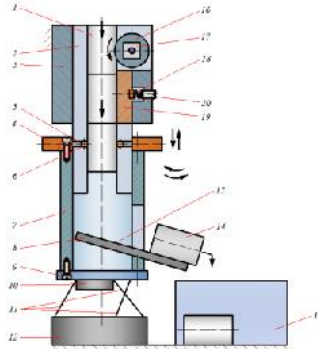
**Description**  
**EN**

The invention relates to the field of mechanical engineering, namely to devices for vibration smoothing by diamond of outer surfaces of cylindrical parts.

The device, according to the invention, comprises a frame (3), made of two vertical walls, on the inner surface of which are fixed guides (2) for the parts (1) and a hollow cylindrical retainer (7), on which are placed at least two toolholders (4), in which is fixed one smoother (5) with diamond (6). In the frame (3) are placed a clamping plate (19) for the part (1), controlled by a screw (20) with a spring (18), and a drive (17) with a drive roller (16). The toolholders (4) are placed with the possibility of reciprocating movement around and along the vertical axis of the vibration smoothing device by means of an electromagnet (12) with spring-loaded rods (11), a core (10) and a disk (9), on which is vertically fixed the retainer (7), in the lower part of which is made an opening for withdrawal of worked piece (14) into a container (13).

**Class no.**

2. Industrial and laboratory equipments.



**MD.17****Title****Beverage emulsion from walnuts *Juglans regia* L.****Authors**

Cristina POPOVICI, Alexei BAERLE, Daniela PALADI, Tatiana CAPCANARI, Pavel TATAROV

**Institution****Technical University of Moldova****Patent no.**

Current research is devoted to develop technology of walnut beverage emulsion production and to analyse its chemical composition, basic quality properties as well as microstructure and rheological behavior in terms of storage. Potentially walnuts were selected to obtain beverage emulsion, not only able to exert health benefits, but also as an alternative to dairy based products.

The technology of walnut beverage emulsion included following main steps: primary walnut preparation, extraction procedure and homogenization. ISO (Official Methods of Analysis of AOAC International) standard methods of analysis have been applied for evaluation of walnut beverage emulsion.

**Description  
EN**

Research gives a detailed analysis of the fatty acid composition of the product by GC-chromatography; 20 fatty acids were found. The highest content is in the mono- and polyunsaturated fatty acids, namely the linoleic, linolenic and arachidonic acids, which are of great nutritive and biological value. Analysis of walnut beverage emulsion microstructure showed that dimensions of oil drops in walnut emulsion are distributed in normal mode, the major part of oil volume is formed by drops with an average diameter of 2.70 microns.

Research results showed high potential and positive view on walnut beverage emulsion production, in agreement with the current demand of healthy products. Results offer new interesting expectations to continue with this research line and demand the application of advanced technologies to provide better quality of the product, being the main challenge to be faced in future studies.

**Class no.**

3, 4

**MD.18.****Title****CLOTHES SENSOR SYSTEM FOR CHILDREN****Authors**

Victoria Danila, Serghei Railean, Antonela Curteza, Marcela Irovan, Stela Balan, Victoria Bodi, Ana Ischimji

**Institution**Technical University of Moldova  
Technical University Gh. Asachi Iasi**Patent no.**

Patent application (in the process of elaboration).

**Description****EN**

Health status monitoring of children is achieved with the development and fusion of sensor systems when the clothes are clothed, transmission of information to physicians and nurses or to the parent. As a clinical tool applied in the monitoring of physiological parameters of Children, clothes sensor systems for Childers are able to transmit the information obtained inside an infant's body during breathing to nurses or parents. Moreover, such clothes with integrated sensors can perceive external threats such as the child's condition at the moment and warn immediately. The latest research and achievements have been highlighted and the meaningful applications in healthcare and behavior analysis are at the application level. Moreover, we give a lucid perspective of the development of clothes sensor systems for children in the future.

Class no.

4

**MD.19.****Title****Plastic Integration****Authors**

Don Z., Racceeva E., Sugac O.

**Institution****Faculty of Textiles and Polygraphy****Patent no.**

-

**Description****EN**

The clothing collection is intended for youth and it is made out of neoprene, knit and silicone. The novelty of the collection is the use of transparent non-traditional materials as a backdrop for the placement of graphic expressions made using artistic print technique (contour).

Class no.

9



INTERNATIONAL EXHIBITS

**MD.20.**

<b>Title</b>	<b>LED street lamp with enhanced performance features</b>
<b>Authors</b>	Secieru V, Munteanu E, Loşmanschii C, Gorgan D, Podgornii D.
<b>Institution</b>	Technical University of Moldova
<b>Patent no.</b>	Pending patent registration
<b>Description</b> EN	The device is based on the Samsung LED in the 5730 body with a power of 0.5W that have a light efficiency ~ 217Lm/W and CRI > 80Ra. The 30W power consumption considerably enhances the reliability of the power supply developed and used by us. The device can replace a metal-halogen or mercury lamp with a power consumption of around 150-250W. Individual lenses are provided for each led with X-150° and Z-70° light output angle, which allows using the designed lamp for night lighting of street areas.
Class no.	1 or 2

**MD.21.**

<b>Title</b>	<b>Phytolamp based on color high-brightness LEDs</b>
<b>Authors</b>	Secieru V, Munteanu E, Loşmanschii C, Gorgan D, Podgornii D.
<b>Institution</b>	Technical University of Moldova
<b>Patent no.</b>	Pending patent registration
<b>Description</b> EN	The device is based on the color high-brightness LEDs with various proportions of colors, in a 5730 body with a power of 0.5W. Samsung LEDs have a light efficiency ~ 217Lm / W and CRI > 80Ra for white color. Epistar led on 0.5W for RED, BLUE and GREEN color. Used power supply is developed by us. The device can replace a metal-halogen or mercury lamp with a power consumption of around 250-600W. We use special design which allows phytolamp for day / night lighting of large areas.
Class no.	5,10

**MD.22.**

<b>Title</b>	<b>Sugar based Carbon Quantum Dots for luminophores applications.</b>
<b>Authors</b>	Loşmanschii C, Podgornii D, Secieru V, Munteanu E, Gorgan D.
<b>Institution</b>	Technical University of Moldova
<b>Patent no.</b>	Pending patent registration
<b>Description</b>	Based on their luminescent properties, carbon nanoparticles

## EUROINVENT 2019

**EN** (CQD) are promising materials in the field of luminophores applications. Using different carbonization precursors and carbon sources, allows shifting of absorption and luminescence wavelength maxima. The usage of various polar solvents increases the quantum yield of CQD, which permits CQD encapsulation in different polymeric matrices, soluble in the same solvents. This process represents an optimization of synthesis methods using ecofriendly synthetic materials and techniques. The applied synthetic approach permits obtaining CQD with high quantum yield, which can be used as cheap and efficient luminophores.

Class no. 5,10

### MD.23.

**Title** High resolution semiconductor switch

**Authors** I.Stamov, N. Sirbu, A. Dorogan

**Institution** Technical University of Moldova

**Patent no.** Pending patent registration

**Description**

**EN**

The active layer of the high resolution semiconductor switch is based on single crystal compound  $Ag_3AsS_3$  placed between metal electrodes. The switching time from high to low ohmic state of the device consists tenths of seconds and depends on the applied voltage. The change of switching time to low ohmic state occurs if applying mechanical pressure on the active layer. This structure can be used to manufacture high precision electronic scales, as it permits to measure weights of 5•10-5grams. The structure is also sensible to vibrations.

Class no. 5,10

### MD.24.

**Title** Avis collection

**Authors** Țurcan E., Tocarciuc A., Racceeva E., Sugac O.

**Institution** Faculty of Textiles and Polygraphy

**Patent no.** -

**Description**

**EN**

The clothing collection has an original artistic character by embodying birds images in modern design solutions. The embellishment on the models implies a new approach to traditional decorative techniques: artistic print, mechanical application and embroidery. One of the novelties of the collection is the use of the phosphorous wire in the decorative solution of the collection.

Class no. 9

**MD.25.**

<b>Title</b>	<b>Plastic Integration</b>
<b>Authors</b>	Don Z., Raccееva E., Sugac O.
<b>Institution</b>	<b>Faculty of Textiles and Polygraphy</b>
<b>Patent no.</b>	-
<b>Description</b> EN	The clothing collection is intended for youth and it is made out of neoprene, knit and silicone. The novelty of the collection is the use of transparent non-traditional materials as a backdrop for the placement of graphic expressions made using artistic print technique (contour).
Class no.	9

**MD.26.**

<b>Title</b>	Process for producing a functional curd dessert
<b>Authors</b>	GHENDOV-MOȘANU Aliona, POPESCU Liliana, STURZA Rodica, LUNG Ildiko, OPRIȘ Ocsana-Ileana, SORAN Maria-Loredana,
<b>Institution</b>	Technical University of Moldova, MD National Institute for Research and Development of Isotopic and Molecular Technologies INCDTIM Cluj-Napoca, RO
<b>Patent no.</b>	MD 1289 (13) Y 2018.10.31
<b>Description</b> EN	The invention relates to the dairy industry, namely to a process for producing a functional curd dessert. The process, according to the invention, comprises mixing the curds with a fat content of 0...9% with sugar syrup of 65...85% and pasteurized cream with a fat content of 20...35%, pasteurizing the mixture at a temperature of 72...77°C, adding a stabilizer, cooling to a temperature of 50...55°C, adding a hydroalcoholic extract of black chokeberry or sea buckthorn, or hips, or haws with a dry substance content of 40...85%, in an amount of 0.4...3.0%, stirring and cooling to a temperature of 2...6°C. The result of invention consists of obtaining functional curd dessert with a higher biological value, higher organoleptic indexes and an extended shelf life.
Class no.	3. Agriculture and Food Industry

**MD.27.**

<b>Title</b>	<b>Process for producing semi-finished products of minced mutton</b>
<b>Authors</b>	SCRIPCARI Ion, GRUMEZA Irina, MACARI Artur, MD;



	GUDIMA Angela, MD; COEV Ghenadie, MD.
<b>Institution</b>	<b>Technical University of Moldova</b>
<b>Patent no.</b>	Md 1063 Z 2017.03.31
	The invention relates to food industry, namely to a process for producing semi-finished products of minced mutton. The process, according to the invention, comprises grinding of mutton in a meat grinder with the sieve mesh diameter of 2...3 mm, mixing of minced meat in a mixer with nut grits, food table salt, sodium bicarbonate, fresh garlic, ground black pepper and drinking water, modeling of semi-finished products, packaging and sealing.
<b>Description</b>	The result of the invention consists in obtaining of semi-finished products from sheep minced meat with improved organoleptic and physico-chemical properties and a ameliorated nutritive and biological value of the finite product.
<b>EN</b>	The result is that oilseed groats from walnuts has a good water binding capacity of 42,2...55,16%. By absorbing water, the meat increases its volume and weight, thus improving the freshness and succulence of the finished product. The result can be obtained using the indicated ingredient ratio.
	The products obtained according to the claimed process are of superior quality with increased biological value and safe for consumption.

Class no.

3

**MD.28.**

<b>Title</b>	PdO/PdO <sub>2</sub> mixed oxides nanoparticles-functionalized ZnO nanowires
<b>Authors</b>	Postica Vasile, Pauporté Thierry, Trofim Viorel, Ababii Nicolai, Lupan Oleg
<b>Institution</b>	<b>Technical University of Moldova</b>
<b>Patent no.</b>	Md1859/2018
	The invention relates to the technology of the metal oxides, in particular to the electrochemical one-step synthesis of Pd and PdO/PdO <sub>2</sub> mixed oxides nanoparticles-functionalized ZnO nanowires at temperature of 90 °C. The electrolyte solution consist of 0.2 mM ZnCl <sub>2</sub> + 0.1 M KCl + PdCl <sub>2</sub> 1.5 μM and applied potential of - 0.51 ÷ - 0.7 V. The oxidation of Pd nanoparticles to PdO/PdO <sub>2</sub> mixed oxides was achieved by two-step thermal annealing (at 150 to 250 °C with growth
<b>Description</b>	
<b>EN</b>	

rate of 1 °C/min, and then maintaining at 250 °C during 12 h). The developed technology allows to essential reducing in technological steps of high performance nanomaterials synthesis.

#### Applications

It can be applied in the manufacture of high performance hydrogen gas sensors, ultraviolet photodetector, and nanosensors based on individual structures or single nanowire. Due to presence of Pd and PdO/PdO<sub>2</sub> mixed oxides nanoparticles, the possibility of reliable and highly efficient hydrogen gas detection at room temperature is demonstrated. This excludes the necessity of using the microheaters, which considerably reduce the cost of fabrication and power consumption. The obtained highly sensitive nanomaterial can be further integrated in the portable devices for the safety and protection purposes against the indoor and outdoor hydrogen gas leakage, including the industry of semiconductors.

Class no. 12. Safety, protection and rescue of people

### MD.29.

<b>Title</b>	<b><i>Device for measuring the parameters of a sensor based on nanostructured semiconductor oxides in the range of the order of microwatts</i></b>
<b>Authors</b>	VERJBIŢKI Valeri, LUPAN Oleg, RAILEAN Serghei
<b>Institution</b>	<b><i>Technical University of Moldova</i></b>
<b>Patent no.</b>	<b>MD 1270 Z 2018.07.31</b>
<b>Description</b>	The device for measuring the parameters of a sensor based on nanostructured semiconductor oxides in the range of the order of microwatts comprises an adjustable reference voltage source, connected in series to a test sensor and a standard resistance. The total voltage drops across the sensor and the standard resistance, and separately, the voltage drops across the standard resistance being applied to the inputs of two analog-to-digital converters of a microcontroller through two operational amplifiers. The outputs of the microcontroller are connected by a digital-to-analog converter to the input of the adjustable reference voltage source and to a screen for displaying the obtained results.
<b>EN</b>	
<b>Class no.</b>	<b>1. Environment - Pollution Control</b>

**MD.30.**

**Title** Shoes collection for family  
**Authors** Ghermec Cristina, Marina Malcoci, Bulgaru Valentina  
**Institution** Universitatea Tehnica a Moldovei  
**Patent no.** -

**Description**  
 EN The Family Footwear Collection is a capsule collection. This includes jerky shoes that are intended for mothers; teen shoes, with buckle closing system; men's shoes, closure system - elastic. All the models in the collection are characterized by: the materials used for the faces (the tip and the rook are from the bovine box, and the velour top); color - brown; the same configuration of the landmarks; the presence of the perforation.

Class no. 9 /14

**MD.31.**

**Title** Procedure for making conical gears  
**Authors** Alexandru Mazuru, Alexei Toca, Sergiu Mazuru  
**Institution** **Technical University of Moldova**  
**Patent no.** MD 3562 F1 2008.04.30

**Description**  
 EN The invention relates to the manufacture of gear wheels, namely to the manufacture of bevel gears by stamping. The process for bevel gear manufacturing includes stamping in two phases with final and preliminary calibers, wherein, according to the preliminary caliber the base area and width in the cross-section of the teeth are equal correspondingly to the base area and width in the cross-section of the final tooth. In the final and preliminary caliber the bevel gear teeth are formed in the shape of trapezium, in the preliminary caliber the teeth thickness round the basic circle is taken greater than the thickness of the final teeth, the value of the angle between the lateral areas of the trapezium and of the axis of symmetry of the tooth is approximately equal to the slope of the channel. In the final caliber the punch is communicated at the axial displacement a partial rotary motion by a kinematical connection between the punch and the ejector.

Class no. 5

**MD.32.**

**Title** Device for glassware moulding by vacuum suction method  
**Authors** Pavel Cosovschi, Sergiu Mazuru  
**Institution** **Technical University of Moldova**  
**Patent no.** MD 4143 B2 2011.12.31

**Description**  
**EN**

The invention relates to glass industry and can be used in the creation of a device for glassware moulding by vacuum suction method. The device for glassware moulding by vacuum suction method comprises a mould (2), mounted on a holder (1), and a blade (3) located coaxially with the mould (2). In the blade (3) are made cooling channels (4) and a central hole, in which is fixed a suction head (6), which is connected to a vacuum line (7) and communicates with blind cooling channels and vacuum cooling channels (5) made in the blade (3), which communicates in turn with vacuum channels (8), communicating with vacuum channels of smaller size (9). The channels (8, 9) are made in the mould (2). The vacuum cooling channels (5) are equipped with a valve and communicate with the cooling channels (4). In the blade (3) are made axial channels (10), which communicate with cooling channels (11) made in the mould (2). The number of blind cooling channels and vacuum cooling channels (5) is chosen depending on the weight and configuration of the lower part of the product (13).

Class no.

5

**MD.33.**

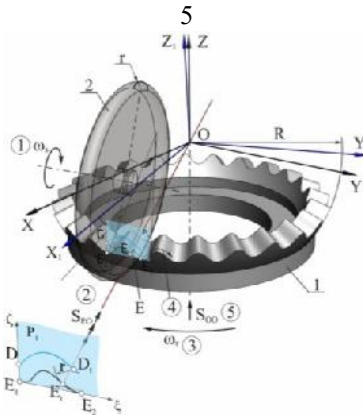
**Title** Process for machining of gearwheels consists  
**Authors** Sergiu Mazuru, Maxim Vaculenco, Serghei Scaticailov, Ion Bostan  
**Institution** **Technical University of Moldova**  
**Patent no.** Cerere de brevet nr. 1895 din 14.03.2019

**Description**  
**EN**

The invention relates to the mechanical engineering, in particular to the gear-wheel working. The process for working the precession engagement teeth consists in that a tool is imparted a motion, imitating the real operating conditions by coordinated displacement with respect to the mobile system of coordinates (X1, Y1, Z1) and the fixed system of coordinates (X, Y, Z), the origin of coordinates of which coincides with the center of spacespherical motion,

the  $Z_1$  axis forming with the  $Z$  axis a nutation angle and describing a conic plane with the vertex in the center of space-spherical motion. The tool, made in the form of profile disk along the edges, with a radius  $R$  is imparted an additional linear motion along the tooth, at an angle  $d > 0$  with the plane formed by the axes  $X_1$  and,  $Y_1$ . At the beginning of working, the center of disk profiling with the radius  $R$  is installed onto the pitch cone for wheel working with the vertex in the center of space-spherical motion, the axis of rotation of the tool is placed perpendicular to the axis of rotation of the blank and the disk axis is placed symmetrically about the  $Z_1$  axis. At the end of the working course, the center of the tool radius  $R$  is deflected from the pitch cone for wheel working with the vertex in the center of space-spherical motion with a predetermined value. The tool is made in the form of profile disks inclined at an angle greater than the nutation angle  $Q$  and is composed abrasive disks.

Class no.



**MD.34.**

**Title**

**Design concept**  
**“AUTONOMOUS VACUUM CLEANER”**

**Authors**

Mircea Nicolăescu; Valeriu Podborschi

**Institution**

**Technical University of Moldova**

**Patent no.**

Patent application

**Description**

Vacuum cleaner - robot, designed for use in living quarters, equipped with three extra dust collection arms in hard-to-reach places, space guidance systems and water filtration.

EN

Class no.



**MD.35.**

**Title** Design concept “PUBLIC ELECTRIC TRANSPORT”

**Authors** Andrei Zbancă; Valeriu Podborschi

**Institution** Technical University of Moldova

**Patent no.** Patent application

**Description**

EN

Concept of public transport of the monorail-suspended train type, propelled by a set of electric motors, which would streamline and ecologize the existing urban traffic.

The gaskets can move both in different ways and in a unique sense, depending on the necessity.

Class no.

**MD.36.**

**Title** Design concept “ELECTRIC TRUCK”

**Authors** Ion Zbancă; Valeriu Podborschi

**Institution** Technical University of Moldova

**Patent no.** Patent application

**Description**

EN

Autonomous electric truck, equipped with modern technologies - autopilot, cameras, locating devices, information systems and intelligent communication.

Class no.



**MD.37.**

**Title** **Avis collection**  
**Authors** Țurcan E., Tocarciuc A., Racceeva E., Sugac O.  
**Institution** **Faculty of Textiles and Polygraphy**  
**Patent no.** -

**Description**  
**EN**

The clothing collection has an original artistic character by embodying birds images in modern design solutions. The embellishment on the models implies a new approach to traditional decorative techniques: artistic print, mechanical application and embroidery. One of the novelties of the collection is the use of the phosphorous wire in the decorative solution of the collection.

Class no. 9



**MD.38.**

**Title** **FIGHTING OF PHASE INSTABILITY OF THE DIGITAL SIGNAL AT RECEPTION IN THE OPTICAL COMMUNICATION NETWORKS**  
**Authors** Dinu Țurcanu, Pavel Nistiriuc  
**Institution** **Technical University of Moldova**  
**Patent no.** nr.2200, G02B5/16;  
 MD 2434, G02;  
 MD 2566, G02

**Description**  
**EN**

Is developed a method for improving quality of service QoS (Quality of Service) in optical communication networks through the suppression of physical jitter using a cylindrical lens and reducing of the value BER (Bit Error Rate). Thus, the magnetoreological cylindrical lens allows us: by choosing the length, diameter, number of segments for magnetizing coils, and distributing the core refractive index profile on the appropriate segments to effect efficient jitter and vander control of digital signal reception in optical communication networks and increase quality of service - QoS.

**MD.39.**

**Title** **Technology of fermented beverage preparation based on walnut milk.**

**Authors** Boaghi Eugenia, Ciumac Jorj

**Institution** **Technical University of Moldova**

**Patent no.** Patent in work

**Description**  
**EN** The invention relates to the food industry, in particular to a process of fermented beverage based on walnut milk. The process included the preparation of walnut milk and its fermentation with some yogurt or kefir and probiotic bacteria addition for fermentation during 12 hours at 37 ° C.

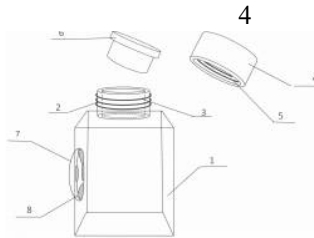
Class no. 3



**"N.Testemiteanu"**  
**State Medical and Pharmaceutical University**

**MD.40.**

<b>Title</b>	<b>Device for preservation of cornea and examination of corneal endothelial cells</b>
<b>Authors</b>	COCIUG Adrian, MD; NACU Viorel, MD; MACAGONOVA Olga, MD
<b>Institution</b>	UNIVERSITATEA DE STAT DE MEDICINĂ ȘI FARMACIE "NICOLAE TESTEMIȚANU" DIN REPUBLICA MOLDOVA, MD, Laboratorul de inginerie tisulară și culturi celulare
<b>Patent no.</b>	<b>Patent no. MD 1311 (13) Y</b> Device for preservation of cornea and examination of corneal endothelial cells (57) The invention relates to medicine, namely to devices for preservation of cornea and examination of corneal endothelial cells, and can be used in regenerative medicine, the field of stem cells, morphopathology, histology and ophthalmology. The device, according to the invention, consists of a cube-shaped vessel (1) of a volume of 125 mm <sup>3</sup> , one of the walls of the vessel (1) is made with a neck (2) with a diameter of 20 mm, a height of 10 mm and with an external thread (3). The neck (2) is closed with a rubber plug (6) and a polyacrylic cap (4) with an internal thread (5). On one of the walls adjacent to the wall with the neck (2), inside the vessel (1), is formed an outwardly concave recess (7) of a volume of 1 ml and a recess of 5 mm. At the edge of the recess (7), in the vessel (1), are fixed four legs (8) in the form of a semicircle of a length of 3 mm, placed in pairs, diametrically opposite. All elements are made of polyacryl.
<b>Description EN</b>	
<b>Class no.</b>	



**MD.41.**

<b>Title</b>	<b>Method for diagnosing neuromuscular disorders in children with maxillofacial anomalies</b>
<b>Authors</b>	POȘTARU Cristina, MD; RAILEAN Silvia, MD; RAILEAN Gheorghe, MD; POSTNIKOV Mihail, RU; RODIONOVA Anastasia, RU
<b>Institution</b>	<i>NICOLAE TESTEMITEANU</i> State Medical and Pharmaceutical University
<b>Patent no.</b>	Patent application No: MD 1293
<b>Description</b> EN	The invention relates to medicine, in particular to neurology and dentistry and can be used for diagnosing neuromuscular disorders in children with maxillofacial anomalies. Summary of the method consists in that it is performed the electromyography using electrodes in the form of small disks on the surface of the skin in the region of the mastication and temporal muscles on both sides and is recorded the bioelectric activity at rest, for 10 min, then after the application of an exercise stress with maximum mandibular muscular contraction, for 10 s and after the relaxation of muscles, in 10 min after the exercise stress, in the event if the ratio between the value of normal bioelectric activity to the value of bioelectric activity, obtained from the patient with maxillofacial anomalies for the 90%, after the application of the exercise stress is of...mastication muscle at rest is of 95 55% and after the relaxation of muscles...80 70%, and for the temporal muscle...is of 98 94%, it...65% and after the relaxation of muscles - 111...at rest is more than 110%, after the application of the exercise stress - 92 is diagnosed the presence of neuromuscular disorders. Applications: Medicine , stomatology
Class no.	4

**MD.42.**

<b>Title</b>	<b>METHOD OF TREATMENT OF UMBILICAL HERNIA IN PATIENTS WITH LIVER CIRRHOSIS</b>
<b>Authors</b>	<b>PISARENCO Sergiu, MD; CUSNIR Adrian, MD; ANGHELICI Gheorghe, MD; ZUGRAV Tatiana, MD;</b>
<b>Institution</b>	<i>NICOLAE TESTEMITEANU</i> State Medical and Pharmaceutical University, Republic of Moldova

**Patent no.** 1252

The method consists in that a suspension of mononuclear cells containing  $3 \times 10^7$  / ml of cells is separated 24-48 hours prior to intervention from the patient's blood, also is done a paracentesis with the evacuation of 5-8 L of ascitic fluid with intraperitoneal administration of 2 g of ceftriaxone and 200 mg of ciprofloxacin. 2-3 hours prior to intervention, 30-40 ml of blood is taken and centrifuged for 8-12 minutes at 3000-3500 rpm to produce a platelets rich fibrin clot. Hernioplastia is performed by longitudinal or transverse duplication. Is administered 5-15 ml of mononuclear cells suspension in the muscular layer around the plastia, after which the fibrin clot is applied above the plasticized region.

Class no. 4

#### MD.43.

**Title** **METHOD FOR TREATING RECURRENT GIANT INGUINAL HERNIA.**

**Authors** **Pisarenco Sergiu, Cuşnir Adrian, Anghelici Gheorghe, Zugrav Tatiana**

**Institution** *NICOLAE TESTEMITEANU* State Medical and Pharmaceutical University, Republic of Moldova

**Patent no.** 1247

The method consists of preparing from the patient blood a suspension of mononuclear cells, containing  $3 \times 10^7$  cells / ml, 24-48 hours until the intervention. Also, from the patient, 2-3 hours before the procedure, 30-40 ml of blood is taken, which is centrifuged for 8-12 minutes at 3000-3500 rpm to obtain a platelet rich fibrin clot. The intervention consists in hernioplasty of the posterior wall of the inguinal canal with local local tissues. Then a monofilament polypropylene mesh is applied over the musculoaponeurotic layer, which is sutured by the muscular edges. The suspension obtained is administered in the muscle layer at a distance of 1 cm from the edges of the wound in the amount of 5-15 ml and the fibrin clot is applied to the mesh, then the wound is closed.

Class no. 4

**MD.44.**

<b>Title</b>	<b>Method for diagnosis of pulmonary tuberculosis</b>
<b>Authors</b>	GUDUMAC Valentin, GHINDA Serghei, LESNIC Evelina, PRIVALOVA Elena, CARAIANI Olga, DJUGOSTRAN Valeriu, TUDOR Elena
<b>Institution</b>	STATE MEDICAL AND PHARMACEUTICAL UNIVERSITY "NICOLAE TESTEMITANU"
<b>Patent no.</b>	Nr.1246 (Y)
<b>Description EN</b>	<p>The invention consists in the preparation of double test, control, blank and standard samples, namely in the test sample is used the sputum taken from the patient and an incubation medium, comprising adenosine, dissolved in potassium phosphate buffer solution; in the control sample is used the sputum taken from the patient and an incubation medium, comprising potassium phosphate buffer solution; in the blank sample is used physiological saline and an incubation medium, comprising adenosine dissolved in potassium phosphate buffer solution; the standard sample is prepared in a similar way, but the test sample is replaced with a standard ammonium sulfate solution, after which the samples are incubated for 30 min, then a mixture comprising phenol and sodium nitroprusside solution is added to the samples, followed by the addition of a trisodium phosphate solution comprising sodium hypochlorite, then the samples are incubated for 30 min; after the incubation the absorption of the prepared samples is measured at a 630 nm, then is determined the adenosine deaminase activity, the protein concentration in the test sample, the adenosine deaminase specific activity, the percentage concentration of lymphocytes in the peripheral blood of the patient and is determined the coefficient K, and if the coefficient K is greater than 19.7, the pulmonary tuberculosis is diagnosed.</p> <p>The invention can be used for determining the etiology of pulmonary pathologic process, differential diagnosis of pulmonary tuberculosis and with the object of developing methods of treatment.</p> <p>Applications: Medicine, Phthisiopneumology, Laboratory Medicine</p>
<b>Class no.</b>	4

**MD.45.**

<b>Title</b>	Laparoscopic treatment method of refractory ascites in decompensated liver cirrhosis
<b>Authors</b>	<b>ANGHELICI Gheorghe, PISARENCO Sergiu, CRUDU Oleg, LUPU Gheorghe, ZUGRAV Tatiana</b>
<b>Institution</b>	<i>NICOLAE TESTEMITEANU</i> State Medical and Pharmaceutical University, Republic of Moldova
<b>Patent no.</b>	Patent no.1204
<b>Description EN</b>	Method consists in that a decompressed dosed laparocentesis is performed with partial evacuation of the ascitic fluid and intraperitoneal injection of ceftriaxone 2-4 and ciprofloxacin 200-400 mg, simultaneously is transfused the frozen plasma 400-600ml and cryoprecipitate 80-120 ml, after 24-48 h is performed the laparoscopic intervention under general anesthesia, with complete evacuation of the ascitic fluid, the peritoneal lavage is performed with a mixture of 2000-4000ml of physiological saline with dexamethasone 16-24 mg, followed by multiple punctiform excisions of 0.3-0.8 cm of the parietal peritoneum in the region of the diaphragm and the right lateral abdominal wall followed by drainage of the abdominal cavity for 3-5 days with daily lavages in the postoperative period with this mixture with the addition of 10% solution of lidocaine 4-6 ml, after the introduction of the mixture the drains are closed for 24 h, after which they are evacuated.
<b>Class no.</b>	4

**MD.46.**

<b>Title</b>	<b>METHOD FOR DETERMINING THE DEGREE OF SEVERITY OF GASTROESOPHAGEAL REFLUX DISEASE</b>
<b>Authors</b>	<b>DUMBRAVA</b> Vlada-Tatiana, <b>LUPAȘCO</b> Iulianna, <b>GRIBINIUC</b> Anatolie, <b>VENGHER</b> Inna,
<b>Institution</b>	State University of Medicine and Pharmacy „Nicolae Testemitanu” from Republic of Moldova
<b>Patent no.</b>	<b>Patent nr. MD 1094 Z</b>
<b>Description EN</b>	<b>The invention relates to</b> medicine, in particular to gastroenterology and for evaluation of the gastroesophageal reflux disease (GERD) severity degree. The invention consists of clinical examination with assessment of such symptoms as retrosternal pain, regurgitation, deglutition

difficulties, nausea, vomiting, discomfort in mouth and abdomen, dysphonia, neck and ear pain, weight loss; evaluation of their duration and expression and factors that improve and/or worsen them, with the assignment of scores for each symptom (*fig.1*). In the case when the sum of the scores is of 1...70, a minimum degree of severity is determined, of 71...129 – a medium degree and when it is of 130...211, a severe degree of GERD severity is determined

**Benefits and the novelty** of this method is that it determines the degree of severity of GERD, with accurate assessment of evolution, offers the possibility to indicate early differential treatment, depending on the disease severity, to monitor clinical symptoms during medication, permits to prevent disease progression and complications such as esophageal ulcers, Barrett esophagus, esophageal adenocarcinoma, esophageal stenosis, esophageal strictures, esophageal perforation, upper gastrointestinal bleeding, to reduce the frequency of recurrences, and thus substantially improve patients' quality of life. The proposed method presents an effective, profound, representative, sensitive and convenient tool that greatly enhances the quality of the examination, giving the information about main causes determining GERD severity (*fig.2*), permitting initiate treatment strategy and monitor patient's response in a long-term therapy

**Application:** in medicine, especially in gastroenterology in a hospital department and outpatient clinics.

Class no.

4

**MD.47.**

**Title**

**Method of assessing the anti-inflammatory activity of biologically active substances**

**Authors**

**PANTEA Valeriana, COREȚCHI Ianoș, GHINDA Sergiu, GUDUMAC Valentin, TAGADIUC Elena**

**Institution**

**STATE MEDICAL AND PHARMACEUTICAL UNIVERSITY "NICOLAE TESTEMITANU"**

**Patent no.**

**Nr. 1301 (Y)**

**Description  
EN**

The essence of the invention consist in obtaining of the peritoneal macrophage exudate by intraperitoneally injecting to a laboratory animal the Phytolacta lectin

solution; the cells are washed and suspended in a cell culture medium containing fetal bovine serum, gentamicin and fluconazole, then the cell suspension is transferred to wells of a plate and incubated in the CO<sub>2</sub>-incubator for 2-4 hours, after which the non-adherent cells were removed, then to each well of the samples were added cell culture medium containing additionally fetal bovine serum, gentamicin, fluconazole, lipopolysaccharides and different dilutions of the investigated compounds; the control and reference samples are prepared, then the samples are mixed and incubated in the CO<sub>2</sub>-incubator for 24-48 hours; then the supernatant is transferred in the wells of the photometric plate, the HgCl<sub>2</sub>, VCl<sub>4</sub> solution, and Griess reagent are added, mixed, and placed to the dark for 30 minutes, after which absorbance is measured at 540 nm and 630 nm, then nitric oxide production inhibition activity is determined.

The anti-inflammatory activity of the biologically active substances is assessed in relation to the reference sample and the higher the inhibitory activity of nitric oxide production, the higher the anti-inflammatory activity of the biologically active substances.

**Applications: Medicine, Pharmacology, Pharmacy, Medicine Technology**

**Class no.** 4

**MD.48.**

**Title**

**Study for obtaining the wild bergamot essential oil with high content of thymoquinone**

**Authors**

Igor Casian, Ana Casian, Vladimir Valica

**Institution**

**"Nicolae Testemitanu" State University of Medicine and Pharmacy, Scientific Medicines Centre**

**Patent no.**

-

**Description  
EN**

In this work has been studied the impact of various technological factors to the thymoquinone accumulation in the essential oil of *Monarda fistulosa* L., obtained by the hydrodistillation. The content of thymoquinone increases considerable during the process of fermentation of humidified plant material in the air stream prior to the essential oil distillation, when takes place the enzymatic oxidation of volatile phenols (thymol and carvacrol) into the thymoquinone. Additionally, the content of

thymoquinone in the essential oil can be increased by performing the distillation with a mixture of steam and air. As a result, was created a technological procedure which allowed to obtain, in laboratory conditions, the Wild bergamot essential oil, that contains 20-32% of thymoquinone and 23-32% of thymol and carvacrol, with a yield of 12.5-14.5 g from 1 kg of the Wild bergamot dried herb.

The advantage of proposed technology is the possibility to obtain the Wild bergamot essential oil with high content of thymoquinone (a natural substance with high antimycotic activity) without using any reagents.

The main field of application is production of pharmaceutical and cosmetic preparations with antibacterial and antimycotic properties.

**Class no.**

4

**MD.49.**

**Title**

**ISOLATION OF BENZOPHENANTHRIDINE  
ALKALOIDS FROM *MACLEAYA* LEAVES  
WITHOUT USING TOXIC SOLVENTS**

**Authors**

Igor Casian, Ana Casian, Vladimir Valica

**Institution**

**"Nicolae Testemitanu" State University of Medicine  
and Pharmacy, Scientific Medicines Centre**

**Patent no.**

-

**Description  
EN**

This study aims to develop a new method for isolation of benzophenanthridine alkaloids from *Macleaya* leaves, which do not use toxic or ecologically dangerous solvents or reagents. According to this method, the extraction of alkaloids from the plant material is performed with 90% ethanol by percolation at  $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$  until 5-8 parts (V/M) of extract is obtained. The extract is acidified with sulphuric acid to pH 4.0-4.5 for sedimentation of ballast substances. After filtration or centrifugation, sulphuric acid is added to the extract to obtain the concentration of 0.1-0.12 M. Crystallisation of bisulphates of alkaloids occurs during 14 days at room temperature, then is finished in 7 days at  $2-8^{\circ}\text{C}$ . The crude product is separated by filtration, washed with 96% ethanol and dried.

Upon purification, alkaloids pass into a concentrated aqueous solution in the form of sulphates. A major part of impurities is removed by sedimentation, the remainder – by



sorption on activated carbon. Than alkaloids are crystallised again in the form of bisulphates or other salts as required. The procedure has been created to obtain the sum of benzophenanthridine alkaloids of *Macleaya* in form of salicylates. This substance, named "Sanguirisal", is proposed as an active substance for preparation of pharmaceutical forms for topic administration, being much more lipophilic than sanguiritrine.

Advantages of the created method are its simplicity and ecological safety.

The main field of application is production of pharmaceutical preparations with antimicrobial properties.

Class no.

4

**MD.50.**

**Title**

**THE EVOLUTION OF THE HEALTH STATUS OF MEDICAL STUDENTS IN MULTIDIMENSIONAL ASPECTS (PHYSICAL, MENTAL, SOCIAL)**

**Authors**

Lilia Lupu, Ghenadie Curocichin, Gheorghe Rojnoveanu, Victor Vovc, Rodica Ignat, Alexei Levițchi

**Institution**

**"Nicolae Testemitanu" State University of Medicine and Pharmacy, Scientific Medicines Centre**

**Patent no.**

-

**Description  
EN**

Aim of study consists in assessing the health status of medical students in a multidimensional aspect (physical, mental, social) during their study years, for the elaboration of prophylactic, maintenance and health promotion measures. According to standard clinical examination 64.91% of the first year students were diagnosed with chronic diseases. *vs.* the students of V<sup>st</sup> year – 80.58%; in the structure of morbidity prevail: diseases of eye and its annexes, osteoarticular system, muscles and connective tissue, genitourinary system, nervous system, digestive tract. Depression symptoms were reported in 52.14% of I<sup>st</sup> year students, *vs.* 26.23% of V<sup>st</sup> year. 22.5% young people of I<sup>st</sup> year suffered from mild depression, 19.7% developed medium depression and 2.1% of them reported severe depression, *vs.* 68,83%, 27,92%, 3,25%, respectively from the V<sup>st</sup> year. According to STAI, the level of severe anxiety was decreased by about 23.0% and the increase of those with the mild and moderate level of anxiety in students of year V as compared to year I.

The confrontation of the objective and subjective data obtained in the research has made it possible to identify the pathologies that require the conduct's optimization and the drawing up of the preventive measures in order to minimize the influence of the academic environment on the health of the future doctors. The originality of the research is assured by the complex use of a series of methodological approaches in assessing the health status of the medical students.

**Class no.** 4

**MD.51.**

**Title**

**Method for treating the avulsion fracture of the calcaneal tuberosity**

**Authors**

FEGHIU Leonid, FEGHIU Ana Maria, FURTUNĂ Ludmila, CLIPA Marcel, GRECU Alexandru Florian, BABICI Octavian, VOLEAC Lilian, TIFOI Iurie

**Institution**

**„Nicolae Testemiteanu” State Medical and Pharmaceutical University, Republic of Moldova, Department of Traumatology and Orthopedy**

**Patent no.**

**Patent nr. MD 1292**

**Description**

**EN**

The invention relates to medicine, namely to traumatology and plastic surgery, and can be used for treating the avulsion fracture of the calcaneal tuberosity. Summary of the invention consists in that it is performed an incision in the posterior part of the calcaneal tuberosity with the obtaining of access to the Achilles tendon fragments. It is performed the reduction of fragments in plantar flexion of the ankle. Two Kirschner's wires are then introduced in parallel through the Achilles tendon insertion site from the medial and lateral parts of the avulsed fragment, perpendicular to the fracture line and directed to the lower part of the calcaneus. Afterwards a sponge screw with a diameter of 4.0 mm is introduced through the lower fragment of the calcaneal tuberosity, from the posteroinferior to the anterosuperior side. Directly through the insertion of the Achilles tendon behind the ends of the Kirschner's wires is passed a tension band with a width of 1.25 mm with the intersection of both ends of the band behind the posterior part of the calcaneus. One end of the tension band is passed around the screw, then the free ends

## EUROINVENT 2019

are attached to the ends of said wires and tightened, the ends of the wires are bent, cut and introduced under the skin, and the wound is sutured in layers.

**Class no.** 4

### MD.52.

**Title**

**Method for vascularized flap grafting of the patellar tendon septic defect**

**Authors**

FEGHIU Leonid, MD; FEGHIU Ana Maria, RO; FURTUNĂ Ludmila, MD

**Institution**

„Nicolae Testemiteanu” State Medical and Pharmaceutical University, Republic of Moldova, Department of Traumatology and Orthopedy

**Patent no.**

**Patent nr. MD 1287**

**Description  
EN**

The invention relates to medicine, in particular to traumatology and plastic surgery and can be used for vascularized flap grafting of the patellar tendon septic defect. Summary of the invention consists in that it is performed the dopplerographic examination to identify the projections of perforated vessels of the posterior tibial artery, is detected the projection of the closest to the defect perforated artery, are determined the sizes of the expected flap depending on the size of the defect, is performed a longitudinal ellipsoidal incision with the convex side up to 1 cm from the selected perforated vessel, is continued the incision in the distal direction with the formation of a flap, which includes the skin, the covering fascia and a 1x5 cm fragment of gastrocnemius muscle tendon, the formed flap is applied on the selected perforated vessel without traumatizing from the anterior side the subcutaneous neurovascular fascicle, after which the flap is rotated by 170°...180°, so that the tendon fragment included in the flap may cover the defect between the ends of the patellar tendon and are sutured to the ends of the tendon fragment the ends of the patellar tendon, and then the wound is sutured in layers.

**Class no.** 4

### MD.53.

**Title**

**Method of collagen sponge obtaining**

**Authors**

COBZAC Vitalie, NACU Viorel, JIAN Mariana, COȘCIUG Stanislav, PALADI Constantin,

<b>Institution</b>	MACAGONOVA Olga <b>State Medical and Pharmaceutical University « Nicolae Testemițanu »</b>
<b>Patent no.</b>	<b>1169</b> The essence of the method consists in pouring a collagen solution into a sealed closed cylinder at one end with a lid covered with a sheet of foil, after which the cylinder with the collagen solution is placed in the vacuum chamber of a lyophilizer and frozen at -60 ° C for 30-40 minutes, then extract from the lyophilizer for 20-40 seconds, turn the cylinder with the collagen upwards, remove the lid and remove the foil, then the cylinder repeatedly is placed in the vacuum chamber of the lyophilizer for 24 ... 30 hours.
<b>Description</b> EN	
<b>Class no.</b>	4

**MD.54.**

<b>Title</b>	<b>The method of surgical treatment at benign bile duct strictures</b>
<b>Authors</b>	Ferdohleb Alexandru, Hotineanu Vladimir, Hotineanu Adrian
<b>Institution</b>	<b>“Nicolae Testemitanu” State University of Medicine and Pharmacy of the Republic of Moldova</b>
<b>Patent no.</b>	<b>Patent No. 1274</b> The advantages of the surgical method are the formation of a hepaticojejunoanastomosis with mucosal adjustment of the mucosa with increased hermetic, prevention of tissue ischemia in the area of anastomosis, the best alignment of the bile partner to the jejunum, positioning of sutures including all the intestinal wall layers and the wall of the hepatic duct except the mucosa, which is an important moment in protecting the anastomosis line from the aggressive action of bile salts, which indirectly induces an inflammatory process with excessive scar tissue formation, simultaneously prevents trauma to the bile duct and bile leakage. As a result of implementation the proportion of postoperative complications has decreased substantially in this group of patients. The proposed information offers the new opportunities in biliary reconstruction surgery at national level.
<b>Description</b> EN	
<b>Class no.</b>	4

**MD.55.**

**Title** **Device for reticulation of collagen sponge with glutaraldehyde vapors**

**Authors** COBZAC Vitalie, NACU Viorel, JIAN Mariana, MD; SAREV Violeta, MACAGONOVA Olga

**Institution** **State Medical and Pharmaceutical University « Nicolae Testemițanu »**

**Patent no.** **1137**

**Description**  
EN

The invention relates to regenerative medicine and tissue engineering, and can be used in medicine and biotechnology, namely as a device for collagen sponges cross-linking, in order to create the resistance to intracorporeal aggressive factors of which acts on the graft after implantation. The advantages of claimed device are his composition of a hermetically closed container wich hold inside a mesh with many small holes through which pass without difficulty the glutaraldehyde vapors and allow a effective cross-linking of collagen, excluding in that way direct contact of glutaraldehyde solution and the biological material and formation of glutaraldehyde polymer, which is retained in the sponges and are difficult to remove.

Class no. 4

**MD.56.**

**Title** **Method for restoring bone defects of alveolar processes in the implantprosthetic rehabilitation**

**Authors** ZUGRAV Vasile, MD; CHELE Nicolae, MD

**Institution** *NICOLAE TESTEMITANU* State Medical and Pharmaceutical University, Republic of Moldova

**Patent no.** Patent No. 1288; 2018.03.30

**Description**  
EN

The invention relates to medicine, in particular to dentistry and can be used to restore bone defects of alveolar processes during implantation and prosthetics. Summary of the method consists in that it is performed the local anesthesia, is made an incision of the mucous membrane, are detached the tissues with the formation of a mucoperiosteal flap, after which are removed the granulation tissues and sharp edges of the bone, are made holes in the cortical layer to the spongy bone zone, is applied a surgical absorbable polyglactin or polyglycolic acid mesh that is adapted to the sizes of the bone defect and fixed at one end by means of absorbable staples to the bone,

in the bed between the mesh and bone is introduced an augmenting material, then the mesh is tensioned covering the augmenting material, and the free edge of the mesh is fixed with absorbable staples to the opposite side of the alveolar process leaving no free spaces in the area of the bone defect, afterwards the mucous membrane is sutured.

**Class no.** 4

**MD.57.**

**Title**

**Method of treatment of Herpes simplex virus type 1 and 2 infection.**

**Authors**

UNCUȚA Diana, SPINU Constantin, Rudic Valeriu, UNCUȚA Andrei,

**Institution**

*NICOLAE TESTEMITANU* State Medical and Pharmaceutical University, Republic of Moldova

**Patent no.**

**MD995, 1609, 1610, 1963, 2671, 3724, 4110**

**Description  
EN**

The invention relates to medicine, in particular to a method of treatment of Herpes simplex virus type 1 and 2-induced infection. The method consists in carrying out the clinical and paraclinical examination of the patient and initiation of etiologic therapy with valacyclovir, and of antiinflammatory, sedative, analgesic, local, immunomodulatory and vitamin treatment. At the same time within 12-24 hours after the clinical examination is carried out, the valacyclovir sensitivity testing of virus strains is taken from herpetic vesicles. In case of detection of acyclovir-resistant strains, it is replaced from the second day of treatment with an antiviral drug with thymidine kinase-independent action based on human recombinant interferon  $\alpha$ -2b.

**Class no.** 4

## Moldova State University

### MD.58.

**Title** EDUCATIONAL FOR DRONE (eDRONE)  
 Florentin PALADI, Tatiana BULIMAGA,  
**Authors** Victor CIOBU, Veaceslav SPRINCEAN, Natalia NEDEOGLO,  
 Corneliu ROTARU  
**Institution** MOLDOVA STATE UNIVERSITY / RESEARCH AND  
 INNOVATION INSTITUTE  
**Patent no.** -  
 The aim of ERASMUS+ eDrone Project is to define a learning  
 environment to deliver more opportunities to access new  
 competences related to the use of drone technologies in  
 professional activities. These new competences refer in particular  
 to the use of advanced ICT solutions for the use of drones and of  
 the data acquired through drones that may go a long way towards  
 the goals and priorities in terms of optimization of the  
 professional competences, that have already been stated in the  
**Description** Social-economic Development Strategy 2020 of all the Partner  
 EN Countries, and in terms of creating new job opportunities,  
 especially for youth that is strongly encouraged by Europe 2020  
 strategy as stated in the European Commission Communication  
 “Youth on the Move”.

Class no. 10

### MD.59.

**Title** **ORGANIC SOLAR CELLS BASED ON SELF-  
 ASSEMBLED ZINC PHTHALOCYANINE AND  
 PERYLENE BISIMIDE**  
**Authors** Vadim FURTUNĂ, Tamara POTLOG, Ion LUNGU  
**Institution** MOLDOVA STATE UNIVERSITY / RESEARCH AND  
 INNOVATION INSTITUTE  
**Patent no.** MD a 2018 0010  
 The invention relates to the charge separation in the segregated  $\pi$ -  
 stacks of Zinc phthalocyanine (ZnPc)-N,N'-Bis(3-pentyl)perylene-  
 3,4,9,10-bis(dicarboximide) (PCDTI). The ability of the charges to  
 migrate through the self-assembled structure show that the charge  
 conduit strategy is a promising approach to improved molecular  
 order without sacrificing solution processing in molecular materials  
 targeting Organic Photovoltaic Devices (OPVs). The problem solved  
 by this invention is the obtaining of bulk heterojunction organic solar  
 cells by solution processes with photovoltaic parameters of current

density higher than in the case when obtained with thermal vacuum evaporation and that of Schottky diodes by solution processes. The bulk electric fields in the ZnPc and PCDTI layers are responsible for the photocurrent generation. In addition, this method is harmless to the environment, much cheaper and exclude working with toxic substances. The advantages of the invention:

- 1) Short circuit current density is higher, due to the improvement of the absorbance of bulk layer (see Table).
- 2) The method excludes the stage of depositing layers in vacuum, which considerably decreases the product prime cost.
- 3) The solvent is harmless and inexpensive. At the same, working with it does not require special equipment.
- 4) Devices that are fabricated on the basis of the structures of ITO/ZnPc:PCDTI/Al are reliable.
- 5) In the case of decreasing of the photovoltaic parameters, the substrates could be utilized again because the ZnPc: PCDTI layers and Al can be easily removed without destroying the substrate with ITO

Class no. 2

#### MD.60.

<b>Title</b>	<b>NEW TECHNOLOGIES FOR CYANOBACTERIA CULTIVATION</b>
<b>Authors</b>	Alina TROFIM, Valentina BULIMAGA, Liliana ZOSIM
<b>Institution</b>	MOLDOVA STATE UNIVERSITY / RESEARCH AND INNOVATION INSTITUTE
<b>Patent no.</b>	Scientific Reserch Laboratory <i>PHYCOBIOTECHNOLOGY</i> MD 4492 and MD 4593 / 2018.01.31
<b>Description EN</b>	New technologies for the cultivation of cyanobacteria strains <i>S. platensis</i> and <i>N. linckia</i> under controlled conditions are proposed. <i>S. platensis</i> cultivation technology includes 2 cultivation steps with the application of two stress factors at the 2 <sup>nd</sup> stage (enhancing illumination up to 5500 lx and supplementation with CuSO <sub>4</sub> ·5H <sub>2</sub> O). <i>N. linckia</i> cultivation technology includes growth at 2500 lx with supplementation of ammonium acetate (2 g/l) on the 7 <sup>th</sup> day. The proposed technologies provide a higher production yield of acidic and sulfated exopolysaccharides by cyanobacteria <i>S. platensis</i> and <i>N. linckia</i> for use in bio- and nanotechnologies, cosmetics, medicine (as antiviral agents, as bacterial anti-adhesive agent against <i>H. pylori</i> infection), agriculture. Application Fields: Biotechnology, cosmetics, agriculture.
Class no.	3



**MD.61.**

<b>Title</b>	<b>CYANOBACTERIUM <i>CALOTHRIX MARCHICA</i> LEMM. – SOURCE OF BIOACTIVE SUBSTANCES</b>
<b>Authors</b>	Alina TROFIM, Valentina BULIMAGA, Valeriu RUDIC, Liliana ZOSIM
<b>Institution</b>	MOLDOVA STATE UNIVERSITY / RESEARCH AND INNOVATION INSTITUTE Scientific Reserch Laboratory <i>PHYCOBIOTECHNOLOGY</i>
<b>Patent no.</b>	MD 4567 / 2018.05.31 The strain <i>Calothrix marchica</i> Lemm. is proposed as a source of bioactive substances that can be employed in new biotechnologies in the field of cosmetics, medicine, pharmaceuticals, as well as animal husbandry and plant agriculture etc. The invention pertains to microbiology and biotechnology. The cyanobacterium <i>Calothrix marchica</i> (source of bioactive substances) is proposed for use in industrial biotechnology for the extraction of bioactive compounds (proteins, lipids, sugars, etc.), as well as pharmaceuticals (medicine production) and cosmetics. In the field of animal husbandry and plant cultivation, it has the role of feed bioadditive and biostimulator. Cyanobacterium <i>Calothrix marchica</i> is a source of bioactive substances, having an high content of lipids – up to 33,7%, sugars – 32,9%, proteins – at least 14,66% dry mass and other components. These substances can be employed in various branches of biotechnology. Application Fields: Cosmetics, medicine, pharmaceuticals, agriculture
<b>Description EN</b>	
Class no.	4

**MD.62.**

<b>Title</b>	<b>CYANOPHITE MICROALGAL STRAIN <i>CALOTHRIX GRACILIS</i> F. E. FRITSCH - SOURCE OF CARBOHYDRATES</b>
<b>Authors</b>	Sergiu DOBROJAN, Victor ŞALARU, Irina STRATULAT, Galina DOBROJAN
<b>Institution</b>	MOLDOVA STATE UNIVERSITY / RESEARCH AND INNOVATION INSTITUTE
<b>Patent no.</b>	MD 4616
<b>Description EN</b>	Cyanophyte microalgae strain <i>Calothrix gracilis</i> F. E. Fritsch was selected in pure culture from the soils of the Republic of Moldova, is found in the collection of the Scientific Research

Laboratory *ALGOLOGY* „Vasile Șalaru”. Cyanophyte microalgae strain *Calothrix gracilis* F. E. Fritsch can be industrially cultivated.

The algae biomass can be applied in pharmacology, human and animal nutrition, as soil biofertilizer (having the biological nitrogen fixation capability in soil) and as a biofilter for wastewater treatment.

**Class** 1,3,4

### MD.63.

**Title**

**CELLS AND PHOTOVOLTAIC MODULE WITH JUNCTIONS FROM InP.**

**Authors**

Vasile BOTNARIUC, Leonid GORCEAC, Andrei COVAL, Boris CINIC, Simion RAEVSCHI

**Institution**

MOLDOVA STATE UNIVERSITY / RESEARCH AND INNOVATION INSTITUTE

MD 4280/2014.10.31, MD 972 Z/2016.06.30, MD 4510/2018.03.31, MD 4554/2018.09.30

**Description EN**

Photovoltaic cells (FC) are obtained from the  $n^+ \text{CdS-p}^0\text{-p}^+\text{InP}$  heterostructure and  $n^+\text{-p}^0\text{-p}^+\text{InP}$  homostructure with and without front layer  $n^+\text{CdS}$ . The optimization of the  $\text{p}^0\text{-InP}$  intermediate epitaxial layer thicknesses, prepared from the gaseous phase in the  $\text{In-PCl}_3\text{-H}_2$  system and the  $n^+\text{CdS}$  frontal layer deposited by the quasi-closed volume method, allowed to obtain the maximum FC efficiency under AM1 conditions – 17,3% for the heterostructure  $n^+\text{CdS-p}^0\text{-p}^+\text{InP}$  and 13,5% for those with homostructure  $n^+\text{CdS-n}^+\text{-p}^0\text{-p}^+\text{InP}$ . The deposition of the  $\text{SiO}_2$  antireflection layer the increases of the short circuit current by 10 ... 15% and the conversion efficiency, respectively. The assembled photovoltaic module based on the obtained FC (25 elements,  $S_{\text{act}} = 37 \text{ cm}^2$ ), generates the power up to 1 W.

Class no. 2

### MD.64.

**Title**

**HOLOGRAPHIC METHOD FOR INVESTIGATIONS OF PETROLEUM PRODUCTS**

**Authors**

Arcadi CHIRITA, Tatiana BULIMAGA, Nadejda NASEDCHINA

**Institution**

MOLDOVA STATE UNIVERSITY / RESEARCH AND INNOVATION INSTITUTE

**Patent no.**

MD 4568C1 /2018.05.31

**Description**

When oil products are illuminated by a focused laser beam, a

**EN** known effect of the formation of thermal lenses in the volume of the liquid is observed, on the basis of which the physical parameters of the oil product can be determined. The essence of the proposed invention is based on the registration of a hologram of the volume of the oil product both for the study of the thermal lens effect and for obtaining of the fluorescence spectra of the investigated oil product. In the proposed invention, the hologram of the volume of oil product is used as a diffraction grating to obtain the fluorescence spectrum, what allows in real-time (with an interval of 0.1 s) to obtain both reconstructed holographic images of thermal lenses and the spectral characteristic of fluorescence of petroleum product. The proposed method allows practically simultaneous reception of both information about the phase change of the object under study and its fluorescence spectrum. The absorption coefficients, optical path length and index of refraction of petroleum products can be obtained using holographic phase analysis. Fluorescence emission is strongly influenced by the chemical composition and physical characteristics of petroleum products. If mechanical impurities or other liquids enter the oil product under study, it will be possible to observe dynamically the influence of external impurities, both on the structure of the petroleum product under study, and on the change in its fluorescence spectrum when interacting with foreign materials.

Class no.

5

**MD.65.****Title**

Copper containing agents with antibacterial activity against gram positive microorganisms.

**Authors**

Greta BĂLAN, Olga BURDUNIUC, Victor ȚAPCOV, Natalia MITKEVICI, Valeriu RUDIC, Aurelian GULEA

**Institution**

**Moldova State University**

**Patent no.**

MD 4614 / Patent application no. a 2018 0021

**Description**

The reported compounds possess bacteriostatic and bactericidal activity against gram-positive microorganisms within the concentration range of 0,0038-62,5  $\mu\text{g} / \text{mL}$ . The identified properties of the named compounds are of interest in extending the arsenal of antimicrobial remedies and allow their use in the case of microorganisms with the resistance to traditional drugs.

**EN**

Class no.

9

**MD.66.**

<b>Title</b>	<b>Intelligent decision-making support system for diagnosis of psychiatric and behavioral disability in epilepsy</b>
<b>Authors</b>	Maria BELDIGA, Alexandru BELDIGA, Alexandru POPOV, Gheorghe CĂPĂȚĂNĂ
<b>Institution</b>	<b>Moldova State University</b>
<b>Patent no.</b>	Application no. 20190021
<b>Description</b>	The existence and progress of human society is due to the fact that each member of the society faces and solves decisional problems of various complexities. The degree of some decision-making classes exceeds the solving power of the human brain (to see the phenomenon of "Bounded Rationality" by Herbert A. Simon). Research on mental and behavioral disorders in epilepsy (TPCE) can be effectively and real-time resolved only with end-user assistance provided by Intelligent Decision Support Systems oriented to TPCE diagnosis (SSDID_TPCE). SSDID_TPCE architecture and functionality are designed based on artificial intelligence methods and techniques.
<b>EN</b>	<b>The applicative value</b> consists in the direct use of SSDID_TPCE by: <ul style="list-style-type: none"> <li>– Community mental health centers (psychiatrists, psychotherapists, psychologists, nurses);</li> <li>– Family doctors' centers (family doctors);</li> <li>– Psychiatric consultation offices in district or community counseling centers;</li> <li>– Psychiatric sections in general municipal, regional hospitals;</li> <li>– Republican psychiatric hospitals (psychiatrists);</li> <li>– Emergency Medical Centers (Doctors in Emergency Service);</li> </ul> Crisis centers (doctors-psychiatrists, psychotherapists, psychologists, medical assistants), etc.
<b>Class no.</b>	10

**MD.67.**

<b>Title</b>	LOW TEMPERATURE SINTERING OF HIGHLY CONDUCTIVE ZNO CERAMICS FOR COST EFFECTIVE PRODUCTION OF OPTOELECTRONIC DEVICES
<b>Authors</b>	Gleb COLIBABA, Victor SUMAN, Dumitru RUSNAC
<b>Institution</b>	<b>Moldova State University</b>

INTERNATIONAL EXHIBITS

<b>Patent no.</b>	Patent application no. <b>a 2018 0065</b>
<b>Description</b> <b>EN</b>	ZnO thin films can be used in semiconductor lighting, piezoelectric transducers, gas sensors and photoconductive devices. DC magnetron sputtering is one of the simplest methods of obtaining ZnO films. However, the efficiency of this method is based on the presence of highly conductive ceramic targets. The disadvantage of classical methods for sintering of ZnO ceramics is the necessity of the use of high pressure technology, very high temperatures (1400 °C) and expensive dopant nanopowders, as well as the decrease in diameter of ceramic up to 20%. The present invention addresses a novel approach for sintering of ZnO ceramics by means of chemical vapor transport using HCl+H <sub>2</sub> +C transport agent. HCl favors sintering of ZnO ceramics at relatively low temperatures, the additional H <sub>2</sub> suppresses the attachment effect of ceramics to ampoule walls, and C contributes to Zn excess in the obtained ceramics, that is favorable for higher charge carrier mobility in ZnO films. The advantages of the proposed method are the following: the low sintering temperature of 1050 °C, 99% of the initial diameter, 80% of single crystal hardness, 90-95% of ZnO density, free from powder pressing, free from attachment effect and graphitization, there is no contamination by Zn, ZnCl <sub>2</sub> or solid C, the high conductivity of 5 (Ω·cm) <sup>-1</sup> . HCl+H <sub>2</sub> +C is effective transport agent for many metal oxides, increasing the doping efficiency of ZnO ceramics by several orders of magnitude. This simplifies and reducing the price of manufacturing for uniformly doped ZnO targets and optoelectronic devices with controllable electrical parameters.
Class no.	9

## Institute of Emergency Medicine (IMSP) – R. Moldova

### MD.68.

**Title** Portable device for monitoring vital biosemnals

**Authors** BACIU A., CIOCANU M., BOROVIC E.

**Institution** The Institute of Emergency Medicine

**Patent no.** Patent DMI – MD Nr. 1768 din 27.10.2017

Portable Biosensor for Monitoring Vital Appliances refers to medicine, especially emergency medicine, disaster medicine and SMURD rescue services, family doctors, surgery and treatment rooms, intensive care, home treatment, specialized military units, and more. Access to existing databases with the potential to create new patient databases - PCR, EHR and HIE. The database contains information about physicians working in different medical institutions, patients and medical recommendations patients. The overall software architecture is client-server ⇒ Service Oriented Architecture (SOA). Automatic data transfer in databases by IDNP number with the possibility to access for comparisons.

### Description

#### EN

Funcționalitate suplimentară:

Manager portativ comunicații (ICM): wireless -4G, 3G, Cellular, Wi-Fi, LTE.

Transmisiuni - video, audio și a datelor fiziologice ale pacientului în timp real.

ECG -Transmisie manuală; 5-derivate ECG

In dependenta de categorie de echipa la dispozitiv se conecteaza:

- defibrilator automatic external (AED), - ultra Sunet, - video laryngoscop
- camere de examinare: - otoscop, - eyescop, - dermatoscop,
- stethoscop Electronic, - gluometru.

Class no.

4



**MD.69.**

<b>Title</b>	<b>Triage procedure in the Department of Emergency Medicine (DMU), Emergency Emergency Unit (UPU-S), Emergency Receiving Unit (UPU).</b>
<b>Authors</b>	CIOBANU Gh., ȘANDRU S., CIOCANU M., OGLINDA A.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI seria OȘ 5909 din 28.03.2018
<b>Description EN</b>	Triage - the mechanism or procedure by which patients presenting in adult DMU / UPU-S / UPU are evaluated and classified, taking into account their clinical status and the accusations they present, correlated with their age and past history; stability of vital functions; the potential for aggravation of their condition; the need to institute treatment and follow-up of investigations and other data considered relevant in order to establish the priority with which a patient is assisted and the level of care required. The triage is a continuous process requiring regular re-evaluation of patients until their departure from DMU / UPU-S / UPU adults. <u>Scopul triajului</u> în DMU/UPU-S/UPU adulți este de a prioritiza și de a identifica pacienții pentru a fi consultați și tratați în dependență de gravitatea urgențelor medico-chirurgicale. <u>Indicile de severitate (gravitate)</u> a urgenței medico-chirurgicale (ISU) reprezintă un algoritm de triaj cu cinci nivele care categorizează pacienții din DMU/UPU-S/UPU adulți prin evaluarea gravității și resurselor necesare. Dacă pacientul nu prezintă un grad înalt de gravitate (nivelu ISU I și II) asistenta de triaj va evalua necesitățile estimative a resurselor necesare pentru a stabili ISU nivelul III, IV și V.
<b>Class no.</b>	4

**MD.70.**

<b>Title</b>	<b>The method of quantitative evaluation <i>in vivo</i> of apoptosis, angiogenesis and inflammation in chronic heart failure patients.</b>
<b>Authors</b>	ARNAUT O., SAULEA A., ȘANDRU S., VOVC V., CIOCANU M., CLIM A., COBILEȚCHII S., BALTAGA R., GRABOVSCII I., LOZOVANU Sv.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI MD seria OȘ 5901 din 02.03.2018
<b>Description</b>	Chronic Heart Failure (CHF) being a significant cause of

EN morbidity and mortality required new prophylactic, diagnostic and therapeutic strategies . Despite of improvement in management of CHF the morbidity and mortality for these patients remain high and need new approaches. Factor analysis is a specific statistical instrument for quantitative estimation of parameters/proceesses that can not be meased directly. This method allows to take in account a lot of covariates and according to regression coeffitients to calculate „latent” factors.

We have created two mathematical models with adequate fit to estimate the processes above quantitatively according to regression coefficients of each biomarker from model, using biochemical markers for inflammation, apoptosis and angiogenesis.

Medicina, în special reanimarea și terapie intensivă. Insuficiența cardiacă cronică (CHF) este o cauză importantă a morbidității și a mortalității. Autorii, utilizând analiza factorială de 92 proteine biomarkeri umane, au elaborat două modele matematice de estimare a inflamației, apoptozei și angiogenezei *in vivo* pentru pacienții cu CHF.

Class no. 4. Medicine - Health Care – Cosmetics

### MD.71.

#### Title

**Guide / Algorithms for receiving population calls on medical-surgical emergencies in dispatch office 112**

#### Authors

CIOBANU Gh.

#### Institution

**The Institute of Emergency Medicine , The State University of Medicine&Pharmacology“N.Testemițanu”**

#### Patent no.

Certificat SAIP AGEPI seria OȘ 6176 din 03.10.2018

#### Description

EN

The guide is a standardized way of receiving and systematizing all calls from the population to 112 dispatcher in 4 medical-surgical emergency blocks: traumas, basic medical problems, time / life critical issues, various. Each module includes the method of questioning the caller and highlighting the complaints, signs and symptoms that argue the assignment of the problem to a particular module, the degree of seriousness of the medical problem and the way of intervention and the resolution of the request. Each module also contains first AID advice until the Emergency team arrives. Acest algoritm au fost aplicat in practica IMSP IMU specifică și implicarea altor servicii în soluționarea cazului dat, asigurarea siguranței pacientului, apelantului și a membrilor echipajului de urgență, un modul aparte prevede modalitatea de categorisire a apelurilor după gradul de urgență și



de intervenție și au fost aprobat prin ordinul Ministerului SM și PS nr 821 din 28.06.2018 „Cu privire la aprobarea Algoritmului de recepționare și gestionare a apelurilor de urgență medicală”.

Class no.

4

**MD.72.**

**Title**

**Nonoperative management of closed traumatic lienal diseases**

**Authors**

GHIDIRIM Gh., ROJNOVEANU Gh., GURGHIS R., CIOCANU M., GAGAUZ I., BESCHIERU E., GAFTON V.

**Institution**

**The Institute of Emergency Medicine , The State University of Medicine&Pharmacology“N.Testemițanu”**

**Patent no.**

Certificat SAIP AGEPI seria OȘ 6003 din 24.05.2018

**Description  
EN**

The incidence of splenic lesions is reported in about 30% of all cases of closed abdominal trauma. Exploratory laparotomy with organ repair or removal was the only previously accepted surgical method. Currently, LL management has changed from the operator immediately in all cases, to the nonoperative to stable haemodynamic trauma, with quite high success rates. On the basis of the results obtained, it has been proved that the non-operative tactic can be applied both in the isolated abdominal trauma and in the polytraumatism. Moreover, on the basis of the results we can state that TNO is indicated and does not pose additional risks even to serious politraumatics with ISS> 25, and the lack of correlation between the ISS score and the LL degree is the strong argument in favor of this statement.

Medicina, în special chirurgia. Utilizarea laparoscopiei ca metodă diagnostică la pacienții cu traumatism abdominal închis, iar în anumite cazuri și ca metodă curativă prin aplicarea mijloacelor laparoscopice de hemostază definitivă, este inegal aplicată de diferite școli chirurgicale.

Class no.

4

**MD.73.**

<b>Title</b>	<b>Nonoperative management of closed traumatic hepatic diseases.</b>
<b>Authors</b>	GHIDIRIM Gh., SUMAN Ala, ROJNOVEANU Gh., SUMAN S., ȘTEPA S.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI MD seria OȘ 6221 din 28.11.2018
<b>Description EN</b>	The evolution of cholelithiasis may take several forms, which in turn condition the therapeutic tactics: asymptomatic evolution of LB, chronic calculus cholecystitis, acute calculus cholecystitis and computed acute calculus cholecystitis. miniinvasive interventions, especially CEL, performed within optimal time from the onset of the disease, in specialized care, allow improvement of the results of the treatment of acute complicated cholecystitis. If necessary, they can be done in stages, the order of which is determined in each case. New miniinvasive technologies, tailored and used appropriately to concrete situations, are becoming increasingly widespread in practical medicine. In CACC, treatment should be strictly individualized.
<b>Class no.</b>	4

**MD.74.**

<b>Title</b>	<b>Acute ischemic stroke. Mechanical thrombectomy-premiere in republic of Moldova .</b>
<b>Authors</b>	GROPPA St., BARAT S., ZOTA E., SMOLNIȚCHI R., CRIVORUCICA I., MANICA ȘT., MANEA DIANA, GASNAȘ A., NIGULEANU E.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI MD seria OȘ 6239 din 18.01.2019
<b>Description EN</b>	Mechanical neurotrombectomy is a revolutionary method in the treatment of ischemic stroke and was successfully implemented for the first time in the Republic of Moldova. The success of cerebral revascularization in acute ischemic stroke is due to a number of factors, among which the most important are: finding the patient in the therapeutic window (<6 hours), results of score ASPECTS > 6 at Computer Tomography, the maximal shortening with timing of the stages up to puncture and reduction of the intervention time, working in a multidisciplinary team consisting of neurologist, endovascular surgeon, anesthetist, imagist, medics

## EUROINVENT 2019

of interventional medicine and anesthesiology, treatment adequate. Primele două cazuri de tratament cu succes a pacienților cu ictus acut ischemic folosind metoda de neurotrombectomie mecanică au fost efectuate în Clinica de Neurologie și Neurochirurgie în cadrul Lab. de Medicină Intervențională al Institutului de Medicină Urgentă, sub conducerea academicianului Stanislav Groppa

Class no. 4

### MD.75.

**Title**

**Tumors of the small intestine: optimization of diagnosis and surgical treatment.**

**Authors**

GHIDIRIM Gh., MIȘIN I., CERNAT M., GHEORGHÎȚA V.

**Institution**

**The Institute of Emergency Medicine , The State University of Medicine&Pharmacology“N.Testemițanu”**

**Patent no.**

Certificat SAIP AGEPI MD seria OȘ 5987 11.05.2018

**Description  
EN**

The small intestine makes up 80% of the gastrointestinal tract (TGI) and 99% of the absorbent surface, and the tumors of this localization are rarely found and comprise 1 to 3% of all TGI formations. It is considered established that malignant neoplasms of the small intestine meet much more often than the benign ones. Up to now, approximately 40 histological subtypes of small intestine tumors (tis) have been established, and 44% of carcinomas, adenocarcinomas (33%), lymphomas (15%) and sarcomas (7 %). In order to improve the results of surgical and combined treatment of small bowel tumors based on the optimization of the diagnostic and curative algorithm, as well as the evaluation of the early and distant treatment results, the basic clinical manifestations of the small intestine tumors were evaluated. The information of the radiological methods in the diagnosis of the small intestine tumors , determined the optimum volume of operations in small intestine tumors.

Class no. 4

### MD.76.

**Title**

**Non-invasive stimulation and kinetotherapy in patients recovery with acute ischemic stroke.**

**Authors**

PÎRȚAC I., SAMOTIUC E., CIOCANU M., DANAIL S., GASNAȘ AL., GROPPA St.

**Institution**

**The Institute of Emergency Medicine , The State University of Medicine&Pharmacology“N.Testemițanu”**

**Patent no.**

Certificat SAIP AGEPI MD seria OȘ 6201 din 29.10.2018

<b>Description</b> EN	Brain injuries caused by stroke can lead to loss of brain function, and with the loss of the function of an area of the brain that involves conducting motor activity, the body part that has been interconnected with this brain area. And most stroke survivors have physical weaknesses such as muscle weakness, low motor control, and instability in maintaining balance that significantly compromises their functional mobility, independence in day-to-day activities, community reintegration, and quality of life. A staged recovery algorithm was developed for kinetotherapy and transcranial magnetic stimulation for patients with acute ischemic stroke. The progress achieved within 10 days of differential treatment. Until 5th day there is an insignificant increase in the indexes of the evaluation scales, and the next five days the progress continues with a more pronounced increase.
Class no.	4

**MD.77.**

<b>Title</b>	<b>Clinical evaluation, diagnosis and treatment of acute complicated calculous cholecystitis.</b>
<b>Authors</b>	GHIDIRIM Gh., SUMAN Ala, ROJNOVEANU Gh., SUMAN S., ȘTEPA S.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI MD seria OȘ 6222 din 28.11.2018
<b>Description</b> EN	Complicated acute calculus cholecystitis is a more or less controversial clinical entity. Clinical manifestations of CCAC differ from CCAC components: destructive, especially obstructive, association with coledocolitias, colangitis, especially purulent, stenoses of the hepatic collagen duct, obstructive icterus. In these cases the pathological process often involves the pancreas, the liver - situations that complicate the condition of the patients, while, at the same time, they urgently require the surgical treatment, even in the most cruel way - cholecistostomia. The correct diagnosis, established with the involvement of the complex exploration of the patient, including dynamic ultrasound, other instrumental examinations, the application of modern technologies and the performance instrumentation, to highlight the complications or pathologies.
Class no.	4

**MD.78.**

<b>Title</b>	<b>Nonoperative management of closed traumatic hepatic diseases</b>
<b>Authors</b>	GHIDIRIM Gh., ROJNOVEANU Gh., GURGHIȘ R., CIOCANU M., GAGAUZ I., BESCHIERU E.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI seria OȘ 6002 din 24.05.2018 The liver remains one of the most traumatized organs, especially in politraumatization with closed abdominal trauma, and is the leading cause of death in severe hepatic trauma, with a mortality of 10-15%. In the last decades, TNOs with perihepatic "packing" and planned reexploration are the most important purchases in liver trauma therapy. The arguments in favor of the non-operative option in the polytraumatized, in terms of the LH grade interrelation (AAST) and the ISS value, allow us to note that the TNO in the poly-trauma does not pose additional risks, and the evolution of the politraumatized depends entirely on the success of the hypovolemic shock, 2%) of serious traumatized patients with $ISS \geq 25$ prevailing significantly.
<b>Description EN</b>	
Class no.	4

**MD.79.**

<b>Title</b>	<b>The method of assessment of patient with suppositive diagnosis of epilepsy with nocturnal epileptic seizures</b>
<b>Authors</b>	Chiosa V., Groppa St.
<b>Institution</b>	<b>The Institute of Emergency Medicine , The State University of Medicine&amp;Pharmacology“N.Testemițanu”</b>
<b>Patent no.</b>	Certificat SAIP AGEPI MD seria OȘ 6220 din 28.11.2018 Epileptic seizures and epilepsy have a major medical-social impact due to epidemiological data and clinical peculiarities. Establishing the diagnosis and initiating appropriate treatment is the primary goal of evaluating the patient with epilepsy. In epilepsy with nightly epileptic seizures, given that epileptic seizures occur only at night, it is difficult to be viewed, documented and analyzed. In this context, anamnesis and clinical data are particularly important in assessing of these patients, although they have a low level of certainty. The development of an assessment card for patients with the diagnosis of epilepsy with nocturnal epileptic seizures facilitates the correct diagnosis and the initiation of appropriate treatment.
<b>Description EN</b>	

Class no. 4

**MD.80.**

**Title** The potential of rehabilitation of patients with ischemic stroke by application of kinetotherapy incorporating the acute period.

**Authors** PÎRȚAC I., SAMOTIUC E., CIOCANU M., DANAIL S., GROPPA St.

**Institution** The Institute of Emergency Medicine , The State University of Medicine&Pharmacology“N.Testemițanu”

**Patent no.** Certificat SAIP AGEPI MD seria OȘ 6202 din 29.10.2018

**Description**  
**EN** After the vascular retention (AVC), rehabilitation should be initiated as closely as possible. The rehabilitation treatment through initiation of physical therapy is vital for the sufferers who have suffered AVC, as this helps to increase the likelihood of achieving total or partial recovery, and in some cases may save lives. The staged algorithm of kinetotherapy was evaluated, which was divided into 5 stages: I Supporting the vital functions, II Restoring the self-posturing function in the throat, III Rising at the edge of the bed, IV Orthostatism, V Walking, applied to the patients with AVC ischemias acut. After recovery, an improvement in all the functions evaluated in both groups was found, but the changes in the experimental group were more pronounced.

Class no. 4

## Institute of Microbiology and Biotechnology

**MD.81**

<b>Title</b>	<b>Nutrient medium for cultivation of <i>Trichoderma koningii</i> Oudemans CNMN FD 15 fungi strain, producer of proteolytic complex</b>
<b>Authors</b>	Ciloci Alexandra, Baca Svetlana, Tiurina Jana, Labliuc Svetlana, Dvornina Elena, Bivol Cezara, Clapco Steliana, Darii Mariana, Kravčov Victor
<b>Institution</b>	Institute of Microbiology and Biotechnology of Ministry of Education, Culture and Research, Republic of Moldova Institute of Applied Physics of Ministry of Education, Culture and Research, Republic of Moldova
<b>Patent no.</b>	Patent application: Nr. a 2018 0083 2018 09 20
<b>Description</b>	Nutrient medium for cultivation of <i>Trichoderma conidia</i> Oudemans CNMN FD 15 fungi strain, characterized that, additionally to the components of the proximal medium, as proteases biosynthesis stimulator, includes isobutyrate-chloro-methoxy-(2,4,6-tris(2-pyridyl)-s-triazine)-manganese(II) methanol solvate compound of the formula $[\text{Mn}(\text{is})(\text{Cl})(\text{tpt})(\text{CH}_3\text{OH})] \cdot \text{CH}_3\text{OH}$ , or diaqua-nitrato-(2,4,6-pyridyl)-s-triazine)-manganese(II) nitrate of the formula $[\text{Mn}(\text{NO}_3)(\text{tpt})(\text{H}_2\text{O})_2](\text{NO}_3)$ in the following concentration,
<b>EN</b>	%: wheat bran - 2.0; soybean meal - 1.0; $\text{CaCO}_3$ - 0.2; $(\text{NH}_4)_2\text{SO}_4$ - 0.1; $[\text{Mn}(\text{is})(\text{Cl})(\text{tpt})(\text{CH}_3\text{OH})] \cdot \text{CH}_3\text{OH}$ or $[\text{Mn}(\text{NO}_3)(\text{tpt})(\text{H}_2\text{O})_2](\text{NO}_3)$ - 0.0005 - 0.0010; drinking water - the rest; initial pH of the medium - 6.25. The technical result of the invention consists in the increase of neutral proteases by 84.9% and 40.9% in the case of Compound I and II, respectively. Application: Industria microbiologică 3 Agriculture and Food Industry
<b>Class no.</b>	

MD.82.

<b>Title</b>	<b>Coordination compounds tetrakis(azido)-bis(isobutyrate)-tetrakis(triethanolamine)-cobalt(II)-tetra-cobalt(III) sesquihydrate and bis(triethanolamine)-cobalt(II) diisobutyrate with properties to biostimulate the synthesis of proteases in <i>Rhizopus arrhizus</i> CNMN FD 03 mycelial fungi strain</b>
<b>Authors</b>	Baca Svetlana, Ciloci Alexandra, Stati Dumitru, Kravțov Victor, Tiurina Janna, Labliuc Svetlana, Dvornina Elena, Bivol Cezara, Clapco Steliana
<b>Institution</b>	Institute of Applied Physics of of Ministry of Education, Culture and Research, Republic of Moldova, Institute of Microbiology and Biotechnology of Ministry of Education, Culture and Research, Republic of Moldova,
<b>Patent no.</b>	<b>Patent application No. A 2019 0007, 2019 02 18</b>
<b>Description EN</b>	<p>The invention refers to chemistry and biotechnology, namely to two coordination compounds based on Co(II, III) with triethanolamine ligand which can find application as catalysts and biostimulators in various chemical and biotechnological processes.</p> <p>According to the invention, it is claimed the tetrakis(azido)-bis(isobutyrate)-tetrakis(triethanolamine)-cobalt(II)-tetra-cobalt(III) sesquihydrate compound of the formula <math>[\text{Co}_5(\text{is})_2(\text{Htea})_4(\text{N}_3)_4] \cdot 1.5(\text{H}_2\text{O})</math> (<b>I</b>) and the bis(triethanolamine)-cobalt(II) diisobutyrate compound of the formula <math>[\text{Co}(\text{H}_3\text{tea})_2](\text{is})_2</math> (<b>II</b>), characterized in that they can be used as biostimulators of the microorganisms enzyme synthesis, which was established by testing the effect exerted on synthesis of exocellular lipases in <i>Rhizopus arrhizus</i> CNMN FD 03 mycelial strain – producer with biotechnological significance.</p> <p>The addition of <b>I</b> and <b>II</b> coordination compounds to the nutrient medium of <i>Rhizopus arrhizus</i> CNMN FD 03 micromycete, in concentration of 5 and 10 mg/L, increases biosynthesis of lipases synthesized by the producer with 29.5...60.0 %, depending on the applied concentration and duration of cultivation of the microorganism.</p> <p>Also, the process for the compounds preparation in the reaction of Co(II) isobutyrate with triethanolamine in the</p>



presence of sodium azide (I) or 3,6-di-2-pyridyl-1,2,4,5-tetrazine (II) in acetonitrile is claimed.

The result of the invention is to create new  $[\text{Co}_5(\text{is})_2(\text{H}_3\text{tea})_4(\text{N}_3)_4] \cdot 1.5(\text{H}_2\text{O})$  (I) and  $[\text{Co}(\text{H}_3\text{tea})_2](\text{is})_2$  (II) compounds with biological properties.

Class no.

3

### MD.83.

#### Title

**Procedure Of Biological Treatment Of Seed Potatoes Against The Nematode *Ditylenchus Destructor***

#### Authors

**TODERAȘ Ion, MELNIC Maria, RUSU Ștefan, ERHAN**

**Dumitru, LUNGU Angela, ONOFRĂȘ Leonid,**

**TODIRAȘ Vasile, SLANINA Valerina, GLIGA Oleseă**

#### Institution

Institute of Zoology of Ministry of Education, Culture and Research

Institute of microbiology and biotechnology of Ministry of Education, Culture and Research

#### Patent no.

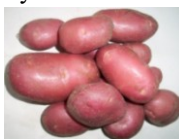
Patent Nr. MD 1297

#### Description EN

The invention relates to parasitology, in special to a biological control procedure of the tuber nematode *Ditylenchus destructor* in seeds potatoes and can be used extensively in agriculture. The procedure consists in the treating of seed potatoes, infested with potato tuber nematode *Ditylenchus destructor*, with the cultural liquid of bacterian strain of autohton origin - the *Rhizobium japonicum* RD2, the *Rhizobiaceae* family, the *Rhizobium* genus, isolated from the pink nodules of the soybean root, which in a dilution of 1: 200, ( $10^9$  cells/ml water) and after 16-hour contact with tubers of seed potatoes affected by ditilenhosis, causes the death of tuber nematode *Ditylenchus destructor* at proportion of 65.0%.

Class no.

3 Agriculture and Food Industry



## Institute of Zoology

### MD.84.

<b>Title</b>	<b>Method for prophylaxis of fasciolosis in ruminants</b>
<b>Authors</b>	Toderaş Ion, Erhan Dumitru, Gherasim Elena, Rusu Ştefan
<b>Institution</b>	<b>Institute of Zoology of Ministry of Education, Culture and Research</b>
<b>Patent no.</b>	MD 1231 Z 2018.09.30
<b>Description</b>	The invention relate to parasitology, namely to a method for prophylaxis of fasciolosis in ruminants. The method, according to the invention, consists in the distribution on the pastures contaminated with <i>Fasciola hepatica</i> , on which the presence of snails of the <i>Limnea truncatula</i> species was determined of <i>Haplometra cylindracea</i> miracidia, in a number that provided a ratio of <i>Fasciola hepatica</i> and <i>Haplometra cylindracea</i> miracidia of (1...3):1.
<b>EN</b>	Implementation act No 2 of the finished scientific elaboration in production on 23 October 2017 in collaboration with the National Agency of Food Safety
<b>Class no.</b>	3

### MD.85.

<b>Title</b>	<b>Method for deparasitiation of cervids</b>
<b>Authors</b>	Toderaş Ion, Rusu Ştefan, Savin Anatol, Erhan Dumitru, Gulea Aurelian, Zamornea Maria, Nistreanu Victoria, Chihai Oleg, Gherasim Elena, Gologan Ion, Rusu Vadim
<b>Institution</b>	<b>Institute of Zoology of Ministry of Education, Culture and Research, State University of Moldova</b>
<b>Patent no.</b>	MD 1303
<b>Description</b>	The invention refers to the protection of hunting fauna, in particular of deer, and can be used for their disinfection both in nature and in zoological gardens. The invention consists in introduction in food supplement during the cold winter (December-February) of briquettes, based on vital components (supplementary feed, vitamin-mineral premix for cattle), which serve as a supplement to the deficiency of vitamin and mineral elements in food at this time of the year, as well as and anti-parasitic and immunostimulating effect. The result of the invention consists in the enhancement of the therapeutic effect, with 97,5% of deer being cured.
<b>EN</b>	The method is being successfully applied in forestry by the „Moldsilva” State Agency (Act on Implementation as of 05 <sup>th</sup> of July 2017).
<b>Class no.</b>	3

## Institute of Chemistry

### MD.86.

<b>Title</b>	<b>Coordination Binuclear Compound Of Europium(Iii) With Mixed Ligands Which Exhibits Luminescent Properties</b>
<b>Authors</b>	Zubareva Vera, Bulhac Ion, Bordian Olga, Verlan Victor, Culeac Ion, Enachescu Marian, Moise Călin Constantin
<b>Institution</b>	Institute of Chemistry of Republic Moldova; Institute of Applied Physics of Republic Moldova
<b>Patent no.</b>	Patent application nr: MD20180063
<b>Description EN</b>	The invention relates to chemistry, namely to a new europium(III) binuclear coordination compound with different bidentate ligands and molecule of 1,10-phenanthroline as crystallization with composition $[\text{Eu}(\mu_2\text{-OC}_2\text{H}_5)(\text{btfa})(\text{NO}_3)(\text{phen})_2 \cdot \text{phen} (\text{btfa} - \text{monoanion of the benzoyltrifluoroacetone, where phen} - 1,10\text{-phenanthroline})$ , which exhibits luminescent properties.
<b>Class no.</b>	The invention can be used to obtain luminescent films for optoelectronics. <b>9</b>

### MD.87.

<b>Title</b>	<b>Diastereo- And Enantioselective Synthesis Process Of 3-Hydroxy-3-(2-Oxocyclohexyl)Indolin-2-One</b>
<b>Authors</b>	Macaev Fliur, Bilan Dmitri, Radul Oleg, Boldescu Veaceslav.
<b>Institution</b>	<b>Institute of Chemistry, Chisinau, Republic of Moldova</b>
<b>Patent no.</b>	Patent application MD20180110 can be applied in the development of new compounds with anticonvulsive activity.
<b>Description EN</b>	The essence of the invention includes diastereo- and enantioselective synthesis of 3-hydroxy-3-(2-oxocyclohexyl)inolin-2-one. The yield of the process is 65%, diastereoselectivity - 96.5%, enantioselectivity - 99%. The advantages of the proposed invention are accessibility of the used reagents, low toxicity of the catalyst (valinol), high level of diastereo- and enantioselectivity and a good yield.
<b>Class no.</b>	<b>4, 9</b>

**MD.88.**

**Title** **The Synthesis Of 2-Tert-Butyl-3-(1h-1,2,4-Triazol-1-Yl)-2h-Chromen-2-Ol And Its Use In The Development Of New Biologically Active Agents**

**Authors** Macaev Fliur, Zveaghinteva Marina, Stîngaci Eugenia, Pogrebnoi Serghei, Boldescu Veaceslav.

**Institution** **Institute of Chemistry, Chisinau, Republic of Moldova**

**Patent no.** Patent application MD20180034 can be applied in the development of new compounds with fungicidal activity. The essence of the invention includes the synthesis of 2-tert-butyl-3-(1H-1,2,4-triazol-1-yl)-2H-chromen-2-ol and its use in the development of new biologically active agents. The problem solved by the invention includes development of new antifungal compounds active against multidrug resistant fungal strains. The compound thus obtained is 15-40 times more active than the reference fungicide ketoconazole against *Aspergillus fumigatus*, *Aspergillus niger*, *Penicillium ochrochloron*, and *Trichoderma viride*.

**Description**  
**EN**

Class no. **4, 9**

**MD.89.**

**Title** **The new dihomodrimane and norlabdane compounds containing guanidine fragments with antiproliferative and cytotoxic activity.**

**Authors** Aricu Aculina, Kuchkova Kaleria, Duca Gheorghe, Secara Elena, Barba Alic, Dragalin Ion, Ungur Nikon

**Institution** Institute of Chemistry of Moldova

**Patent no.** Patent application a2018 0006, 2018.02.14  
Patent application a2018 0007, 2018.02.14

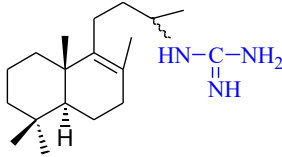
The invention relates to chemistry and medicine, in particular to a compound with a terpenic and guanidine hybrid skeleton, which can be used for the treatment of cancer.

**Description**  
**EN**

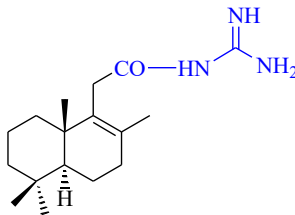
The essence of the invention consists in the claiming 1-(4-((4aS, 8aS)-2,5,5,8a-tetramethyl-3,4,4a,5,6,7,8,8a-octahydronaphtalen-1-yl)butan-2-yl)guanidine and N-carbamimidoyl-2-((8aS)-2,5,5,8a-tetramethyl-3,4,4a,5,6,7,8,8a-octahydronaphtalen-1-yl)acetamide compounds for use as a compound having antiproliferative and cytotoxic activity.

Class no. **9, 4**

**1-(4-((4aS, 8aS)-2,5,5,8a-tetramethyl-3,4,4a,5,6,7,8,8a-octahydronaphthalen-1-yl)butan-2-yl)guanidine**



**N-carbamimidoyl-2-((8aS)-2,5,5,8a-tetramethyl-3,4,4a,5,6,7,8,8a-octahydronaphthalen-1-yl)acetamide**



**MD.90.**

**Title**

**Sulphato-bis(nicotinoylhydrazone)-2,6-diacetylpyridin-cobalt(II) monomethanol trihydrate and process for cultivation of microalga *Porphyridium cruentum* with the use thereof**

**Authors**

Rudic Valeriu, Danilescu Olga, Bulhac Ion, Cepoi Liliana, Rudi Liudmila, Bologa Olga, Rija Andrei, Miscu Vera, Chiriac Tatiana, Valuța Ana

**Institution**

Institute of Microbiology and Biotechnology of Republic Moldova; Institute of Chemistry of Republic Moldova

**Patent no.**

MD4253 C1 invention relates to chemistry and biotechnology, in particular to the synthesis of a new coordinative compound of cobalt(II) and to a process for cultivation of microalga *Porphyridium cruentum* with the use thereof

**Description**  
EN

According to the invention, a coordinative compound sulphato-bis(nicotinoylhydrazone)-2,6-diacetylpyridin-cobalt(II) monomethanol trihydrate is claimed. Also, a process for cultivation of microalga *Porphyridium cruentum* is claimed. The result consists in increasing the antioxidant activity of the alcoholic extract obtained from microalga biomass.

Class no. **3, 4, 9**

**MD.91.**

**Title** Polymeric material with antimicrobial properties

**Authors** <sup>2</sup>Turov Volodymir, <sup>1</sup>Lupascu Tudor, <sup>2</sup>Bogatyrev Victor, <sup>2</sup>Krupska Tatiana, <sup>2</sup>Galaburda Maria, <sup>1</sup>Lupascu Lucian, <sup>1</sup>Povar Igor, <sup>2</sup>Kokosha Natalia

**Institution** <sup>1</sup>Institute of Chemistry of Moldova, <sup>2</sup>Chuiko Institute of Surface Chemistry of NAS of Ukraine

**Patent no.** 4607

Compound with antimicrobial properties PAA-Enoxil is obtained from dry polyacrylamide (PAA) and 2,5% aqueous solution of Enoxil. For this a 40 mm disc of polyacrylamide was placed in a glass beaker (600-800 ml) with 500 ml of 2,5% Enoxyl solution in distilled water.

A volume of 500 ml of solution was used so that its concentration did not decrease substantially after impregnation of Enoxil in the PAA matrix. Swelling of PAA and impregnation of Enoxil in solution was carried out for 20 hours at a temperature of 26-28°C. As a result, a soft orange disk of transparent orange PAA hydrogel is formed with Enoxil solution. The PAA control sample upon swelling in distilled water forms a clear, colorless hydrogel.

**Description**  
EN

The diameter of the PAA impregnated with Enoxil increased to 85 mm (Fig. A). At the same time, Enoxil impregnated PAA disk mass increased about 14-fold (increase in sample mass constituted  $14.0 \pm 0.5$  g per 1 g initial PAA). Drying of the hydrogel was carried out for 6 days at room temperature. The PAA-Enoxil sample obtained in a 2,5% aqueous solution of Enoxil was further heated in a drying oven at 30°C for 4 hours. After removing the water from the hydrogel, PAA discs recovered their original size (Fig. B). As a result of this procedure, the red-brown PAA-Enoxil complex preparation was obtained.

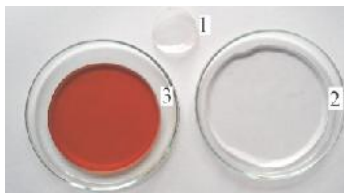


Fig a



Fig b

**a** - PAA initially dried (1), PAA hydrogels kept in the water (2) and in aqueous solution of Enoxil (3);

**b** - PAA-Enoxil dried (left) and PAA dried (right) after water removing from hydrogel by drying in the air.

The results of the testing reveals an increase of the antimicrobial activity of the polyacrylamide with Enoxil in comparison with the closest prior art (cream with Enoxil 2,5%) and is 1,57 ... 1,87 times higher regarding the *B.subtilis*, *B.cereus* and *P. aeruginosa* species, respectively and of 1,76 times higher than the *C. utilis* yeast strain. These antimicrobial properties have been stable for a period of 3 years.

Class no.

9

## Institute of Genetics, Physiology and Plant Protection

### MD.92.

<b>Title</b>	<b>PROCEDURE FOR THE PRODUCTION OF THE USEFUL INSECT <i>TRICHOGRAMMA</i> SPP.</b>
<b>Authors</b>	<b>Gavrilița Lidia, MD, Gorban Victor, MD, Nastas Tudor, MD</b>
<b>Institution</b>	Institute of Genetics, Physiology and Plant Protection
<b>Patent no.</b>	<b>Nr.8863. 2017.10.09</b>
<b>Description</b> EN	The proposed procedure consists of ultraviolet irradiation of eggs of harmful insects to the natural hosts of the bud complex ( <i>Mamestra brassicae</i> L., <i>Helicoverpa armigera</i> Hb.) and the production of <i>Trichogramma</i> spp on them, as a result, increase the biological indexes (female prolific 1.1-1.6 times, lifetime–1.35-2.43 times, hatching of adults with 1-9 % of the parasitic percentage by 1-11%, the share of the females by 2-9.5%, leaving the offspring and by 1.1-2.4 times, the preservation of the genofond of the maternal culture and the saving of the eggs and the entomophage <i>Trichogramma</i> production for plant protection. <b>Applications:</b> Agriculture (Plant Protection)
Class no.	3

### MD.93.

<b>Title</b>	<b>Invention Title <u>AROMA UNICA - the new variety of <i>Lavandula angustifolia</i> Mill. (Lavender)</u></b>
<b>Authors</b>	<b>GONCEARIUC Maria, BALMUȘ Zinaida</b>
<b>Institution</b>	<b>Institute of Genetics, Physiology and Plant Protection</b>
<b>Patent no.</b>	<b>288 MD</b>
<b>Description</b> EN	Lavender variety AROMA UNICA is a first-generation hybrid (F1), vegetative multiplied with average vegetation period. The AROMA UNICA is a variety resistant to frost and winter, to diseases and drought resistant. Plant height is 64 cm. At the density of 10-12 thousand plants per hectare it forms up to 1800-1900 floral stems per plant. The productivity of the variety is 8.9 t / ha of inflorescences containing 1.874% (60% humidity) and 5.476% (dry matter) of essential oil; The production of essential oil constitutes 166.8 kg/ha. The yields of the variety are 19.9 kg/t (of essential oil from the ton of fresh inflorescences). Applications Perfumery, cosmetics, medicine, pharmacology, aromatherapy
Class no.	<b>3,4</b>



**MD.94.**

**Title** Process for micropropagation of *Mentha gattefossei* Maire plants *in vitro*

**Authors** Călugăru-Spătaru T., Ciocârlan N., Cauș M., Dascaluic A.

**Institution** Institute of Genetics, Physiology and Plant Protection

**Patent no.** MD 1091 din 2017.06.30.

The invention relates to biotechnology, in particular to a process for microclonal propagation of *Mentha gattefossei* Maire plants *in vitro*.

The process, according to the invention, includes inoculation of minicuttings and cultivation of the shoots, produced from axillary buds and the parallel induction of rhizogenesis on a nutrient medium that contains ½ mineral salts with respect to the Murashige-Skoog medium, the cultivation time was carried out at a temperature of 26°C, with photoperiod of 16 hours light with intensity of 2000 lx and pH 5,8.

**Description**  
EN

The result consists in the increasing of multiplication coefficient from about 4000 plants in six months (indicated method) to 150000 plants (invention) of *Mentha gattefossei* Maire during the same period, due to the changing of nutrient medium (½ mineral salts after Murashige -Skoog) content. These changes induced growth of shoots with higher number of internodes (that lead to the increase of the potential multiplication coefficient).

The species is protected at the international level as a result of intensive collection for medical purposes and as a food source.

Class no.

3

**MD.95.**

**Title** Method of temperature determination of the root system inhibition in cucumber *Cucumis sativus* L.

**Authors** Cauș M., Calugaru-Spataru T., Dascaluic A.

**Institution** Institute of Genetics, Physiology and Plant Protection

**Patent no.** MD 1134 Z, 2017, 11.30.

The result of the invention consists in the simplicity of determination of the heat shock effect on cucumber germs, with obtaining reliable results on high limiting values of positive temperatures that affect the growth and

**Description**  
EN

development of cucumber seedlings, by damaging the cells of the apical root meristem and the secondary meristem of the intermediate zone between the root and the stem, causing irreversible damage leading to occlusion of growth of the primary roots and, respectively, secondary roots.

The invention relates to agriculture, especially to plants growing, and can be used to determine the high positive inhibitory temperature of the root system in the incipient stages of ontogenesis.

Class no. 3

### MD.96.

#### Title

**PARFUM PERFECT - the new early variety of *Salvia sclarea* L. (Cary sage)**

#### Authors

**GONCEARIUC Maria, BALMUȘ Zinaida, COTELEA Ludmila, BOTNARENCO Pantelimon, BUTNĂRAȘ Violeta, MAȘCOVȚEVA Svetlana**

#### Institution

**Institute of Genetics Physiology and Plant Protection**

#### Patent no.

Patent application No. **V20180027/2018**

#### Description EN

PARFUM PERFECT variety is a triple hybrid. The variety is resistant to cold, winter and disease. PARFUM PERFECT is distinguished by its **high drought resistance**. The plant are erect with quadrangular stem 143.5 cm height; inflorescence are 69.2cm length with 15.0 branches of degree I and 23.0 branches of degree II; large flowers, bilaby, upper violet light upper, lower - white; large bracts, colored in light purple pink; the average inflorescence production in two years exploitation of plantation are 19.4 t / ha (7.8 t/ha in first year and 11.9t/ha in second year) with essential oil content 1.113-1.154% (dry matter). The production of essential oil in two years of harvesting constitutes 60.1kg/ha (15.6 kg/ha in first year and 44.5 in second year), of every ton of raw material obtains 3.47-3.40 kg of essential oil.

Applications: Perfumery, cosmetics, medicine, pharmacology

Class no. 3,4

### MD.97.

#### Title

**ANONA – new tomato cultivar**

#### Authors

**MARII Liliana, BUJOREANU Valeriu, ANDRONIC Larisa, SMEREA Svetlana, BOTNARI Vasile.**

<b>Institution</b>	<b>Institute of Genetics, Physiology and Plant Protection</b>
<b>Patent no.</b>	<b>MD 276 2018.10.31.</b>
	Tomato variety ANONA is created as result of interspecific hybridization of Novicioc variety and spontaneous form <i>Solanum piminellifolium</i> L. The seeds of F <sub>1</sub> hybrid were treated with gamma rays (doze 100 Gy). Subsequently individual selection of plants from segregating populations was applied.
<b>Description</b> EN	The variety is with determinant type of growing. The period of ripening is 95-100 days after seeds germination. The fruits are red and round. Average fruit weight is 29.9 g, characterized as small to medium. Postharvest shelf - life is 25-30 days stored at 16-18 °C. The biochemical parameters of fruits are: total soluble solids -6.19 g%, total sugar - 6.08 g%, ascorbic acid - 30.18 mg%, total acidity - 0.49%. Total harvest is estimated at 36.23 t/ha. It is recommended for seedling and open-field cultivation.
Class no.	3

**MD.98.**

<b>Title</b>	<b>Process for increasing plant cross-tolerance</b>
<b>Authors</b>	Ștefîrță Anastasia, Brînză Lilia, Bulhac Ion, Coropceanu Eduard, Buceaceaia Svetlana, Ionașcu Angela, Covaci Olga
<b>Institution</b>	<b><i>Institute of Genetics, Physiology and Plant Protection</i></b>
<b>Patent no.</b>	Applications: s 2018 0052, 2018.05.29, Process for increasing plant cross-tolerance. This process includes seed treatment before sowing and foliar plant surface 2 times application during vegetative growth with 0.005% aqueous solution of <b>Polyel</b> complex which contains thiourea, macro- and microelements.
<b>Description</b> EN	
Class no.	3

**MD.99.**

<b>Title</b>	<b>A method of treatment of tomato seeds</b>
<b>Authors</b>	Șhubina Victoria, Volosciuc Leonid, Burțeva Svetlana
<b>Institution</b>	<b>Institute of Genetics, Physiology and Plant Protection</b>
<b>Patent no.</b>	Patent MD 8784 Z 2017.07.17. This invention relates to vegetable growing, and can be used to increase germination and yield in the cultivation of tomatoes. The problem that is solved by the present invention is to increase productivity and expand the range of
<b>Description</b> EN	

## EUROINVENT 2019

biological products based on biologically active strains. The effectiveness of the strain as a biocontrol agent is due not only to its activity of antagonism, but also as a producing substance of phytohormonal nature.

The main subject of the invention includes the treatment of seeds before sowing by soaking them in suspensions of the bacterial *B. subtilis* CNMN-BB-09, at a concentration of 0.5 - 1% for 2 hours.

The technical result of the invention is to increase the yield of tomatoes and the expanding range of biologics, possessing plant growth-stimulating activity. The harvest increased 1.7 times relative to the control.

Class no. 3

### MD.100.

#### Title

**Glycoside preparation from plants *Veronica officinalis* with fungicidal properties against *Alternaria alternata***

#### Authors

Șubina V., Mașcenco N., Borovskaia A., Gurev A., Roșca I.

#### Institution

Institutul de Genetică, Fiziologie și Protecție a Plantelor

#### Patent no.

MD 1192 Z 2018.04.30

#### Description

EN

This invention can be used for the production of biofungicides used in the cultivation of vegetables.

The procedure, according to the invention, involves the use of a sum of glycosides of *Veronica officinalis* L. at a concentration of 5x10<sup>-2</sup>% to inhibit the growth of the pathogen *Alternaria alternata*.

The result is to expand the range of biologically active substances of plant origin, environmentally friendly, fungicidal actions used to combat tomato diseases.

Class no. 3. Agriculture and Food Industry

### MD.101.

#### Title

**Common winter wheat (*Triticum aestivum* Desm.), Moldova 16 cultivar.**

#### Authors

Lupascu Galina, Gavzer Svetlana

#### Institution

Institute of Genetics, Physiology and Plant Protection

#### Patent no.

286 MD

#### Description

EN

The Moldova 16 variety was created by individual selection of the hybrid line 101 (Cuban 101 x Golden) x Odeschii 117. The variety is part of the Eritrospermum variety. Spelled with a length of 9.5-10 cm, cylindrical, with 21-23 spicules per spike. Oval red kernels, the 1000 grains are 45-

## EUROINVENT 2019

48 grams. It contains 13.5-14.8% protein and 31% wet gluten. The number of kernels in the spike varies – between 50-55. The vegetation period is 265-270 days. The plants have a height of 83.0-85.0 cm, the degree of twinning - 2.8-3.0 strains per plant. It manifests tolerance to drought, wintering and the main diseases (rust brown, root rot, septoriosi, fusariosi, etc.). The harvest obtained under conditions of production in the years 2017, 2018 constitutes 6.33-6.87 t /ha (the data of the State Commission for the Testing of Plant Varieties of the Republic of Moldova). It is resistant to falling. Sowing is carried out in the first decade of October, with a sowing standard of 4.5-5.0 million grains per hectare (240-250 kg / ha). It is recommended for all cultivation areas of the Republic of Moldova.

Class no.

3

### MD.102.

**Title**

**A new variety of winter triticale – Ingen 54**

**Authors**

Vevertsa E., Lyatamborg S., Lupascu G., Rotari S., Gore A.

**Institution**

Institute of Genetics, Physiology and Plant Protection

**Patent no.**

MD 398

**Description**

**EN**

The variety Ingen 54 has been created through hybridization of the varieties Canar (Romania) and Bogo (Bulgaria) followed by an individual selection in the F<sub>2</sub> generation. The variety belongs to the *Erytrospermum* variation (a white spike, without pubescence, with white and gray awns, the kernel is red). The spike is of a medium size (10.0-12.0 cm long), cylindrical of a medium density (28-30 spikelets per 10 cm of the spike rachis length). The kernel is medium (the weight of 1,000 kernels is 38-39 g), oval, contains 12.0%-13.5% of protein and 23%-24% of gluten. The kernel number per spike varies from 65 to 70. The vegetation period is 270-280 days, if sown in the second-third decade of September. The variety belongs to a medium ripening group. The plants are 100.0-115.0 cm tall, a tillering plant contains 2.8-3.0 stems, the resistance to drought and wintering is good. It is characterized by a good resistance to diseases (mildew, brown and yellow rust, brown foot rot, septoriose etc.) in field conditions. It records a harvest of 6.5-8.5 t / ha, 2.0-3.0 t more than control cultivar Ingen 93. It is resistant to lodging. It has good technological and biochemical qualities.

Class no.

3

**MD.103.**

**Title** New Tomato Cultivar - **PRICHINDEL**  
**Authors** Milania Makovei, Liudmila Guseva, Vasilie Botnari  
**Institution** Institute of Genetics, Physiology and Plant Protection  
**Patent** 242 MD

The cultivar of **Prichindel** tomatoes are the genotypes of new generation. The cultivar of amateur, type dwarf breed (*dd*) of a decorative type, contains the "*pat*" gene that responds to the high degree of fruit in the harsh environment (high temperatures and low enamel). The fruits are small (10-12gr), intensive red, rounded. The variety is highly productive (0,3-0,45gr/plant) and rate of quality is 93.4%. It is resistant to abiotic factors of stress - heat and drought and to the most widespread diseases.

**Description  
EN**

Can be used for open field cultivation according to a compact planting pattern (10 - 12 plants/m<sup>2</sup>), as well as for decorative purposes. It is recommended for fresh use

Class no.

3

**MD.104.**

**Title** **New tomato cultivare Deșteptare**  
**Authors** Mihnea Nadejda, Grati Maria, Lupașcu Galina, Botnari Vasile, Grigorcea Sofia  
**Institution** Institute of Genetics, Physiology and Plant Protection  
**Patent** 279 MD

**Description  
EN**

The fruits of the variety *Deșteptarea* are large size, weighing 110-130 g. The fruits contain 5,9-6,2% of dry matter, 5,3...5,9% sugars, 22,0...26,0 mg/% vitamin C, 0,45...0,55% of acidity. The variety is medium ripening, with vegetation period 114 days. In the seedlings cultivation, the variety ensures a yield of 56.0...62.0 t/ha.

The variety *Deșteptarea* combines high productivity, good tasting qualities and the resistance to drought. The productivity is high at seeds or seedling cultivation.

Class no.

3

**National Institute of Economical Research  
Republic of Moldova**

**MD.105.**

**Title**                     **Application of the econometric model in the assessment of the economic sustainability of the financial system in the region (country)**

**Authors**                 **TOLMACIOVA I., GANEA V, STRATAN A.**

**Institution**           **INCE al AȘM**

**Patent no.**             pending

**Description EN**       The instability of the financial sector, including the banking sector in the recent decades, has become an inevitable premise for expanding international trade, developing new financial instruments and emerging markets. This phenomenon has also shown that no state, regardless of development, is immune to the risks associated with the instability of the financial system. At present, methods of early diagnosis of the current financial market situation in the world and the timely identification of adverse changes are of particular importance. Based on the international experience, in this study, we develop an econometric model with random effects, which allows us to take into account the immeasurable individual differences of the investigated subjects. Thus, indicators deducted by authors help to identify the strengths and weaknesses of the country's financial system and potential or existing risks in its functioning. In dynamics, these indicators can highlight the negative phenomena in the financial system and facilitate the recovery of its sustainable development.

Class no.

## Academy of Economic Studies of Moldova

**MD.106.**

**Title** **Deminuation of inequalities as a factor of sustainable development: analysis through the econometric models**

**Authors** Victor Romeo IONESCU, Monica Laura ZLATI, Valentin Marian ANTOHL, Silvius STANCIU, Svetlana MIHAILA

**Institution** **Academia de Studii Economice A Moldovei -ASEM**

**Patent no.** Certificate SAIP AGEPI MD seria OȘ 6294 din 12.03.2019

**Description EN** The paper proposes a different approach for the analysis of the sustainable development in the context of 2030 Agenda. The authors defined and used a cumulative model. For the beginning, the authors compare the dependent variable with the regressors of the four reporting entities: EU28, Romania, Turkey and Switzerland. These entities cover EU, the country of the authors, a candidate country and non-EU country, as well. The analysis is focused on the Goal 10 from the 2030 Agenda Sustainable Development, covers 2000–2017 and is based on the latest official data from Eurostat. The model used by the authors generated high statistical representativeness. The statistical tests demonstrate the model's homogeneity. A distinct part of the paper is focused on the risk analysis. The authors basically propose a distinct approach which is usefully for the central and regional decision makers. The statistical period took into consideration is good enough to support pertinent conclusions. The analysis leads to the conclusion that Romania can decrease the disparities regarding the sustainable development. On the other hand, the Romania's progress in achieving sustainable development's targets is lowest than the EU average. The model proposed in the paper supports the decision makers in achieving a more performant management regarding sustainable development goals. The paper represents a theoretical approach with great applicability to economic development.

Class no.

14



**MD.107.****Title****Optimizing consumer behavior based on analysis of sensitivity of indicators quality performed by typology regional consumption****Authors**

Grigore BELOSTECINIC, Svetlana MIHAILA, Veronica GROSU, Marian SOCOLIUC, Cristina Gabriela COSMULESE, Alexandru – Mircea NEDELEA

**Institution****Academia de Studii Economice A Moldovei -ASEM****Patent no.**

Certificate SAIP AGEPI MD seria OȘ 6295 din 12.03.2019

**Description EN**

The typology specific to a type of consumption that has developed over time at the regional organization level leads to the formation of atypical characteristics in consumer behavior, coming from structurally non-congruent regions. In this context, the objective of our work is based on building a consumer behavior optimization model, a stability generator at the level of quality food policies. In the model proposed by the authors, on the one hand, are strengthened the current research directions in this field by the study of the specialized literature, and on the other hand, was used the typological quantification of the regional model using statistical, prospective methods (questionnaire-based study) , regressive (model conceptualization). In this respect, the study is based on a questionnaire conducted on the territory of the Republic of Moldova, applied on a sample of 320 persons. The results of the questionnaire led to the quantification of the impact of the quality indicators on consumer behavior and the perception processes at their level. The results obtained are concretized in defining the typology of consumer behavior in the Republic of Moldova in relation to food security and food safety policies and subsequently in developing an optimization model that can be used by producers to develop and ensure sustainable supply on the food market.

Class no.

14

**MD.108.**

<b>Title</b>	<b>Application of the econometric component in solution of atypical situations in the motivational management of human resources</b>
<b>Authors</b>	Grigore Belostecinic, Șargu Lilia
<b>Institution</b>	Academia de Studii Economice A Moldovei -ASEM
<b>Patent no.</b>	pending
<b>Description EN</b>	<p>The management of atypical situations ensures the processes of organization, coordination, decision making and control in dealing with atypical situations. The authors outline and argue the theory of management in solving atypical situations at macroeconomic level. Research is an author's study of identifying solutions for atypical situations that arise in the context of the implementation and implementation of long-term strategies at national level. The research outlines the role of the Lead Manager as a decision-making element in the formation of a professional team to solve atypical situations. The motivational managerial process of human resources proposed by the authors allows for an efficient quantitative evaluation of the efforts made and the formulation of the recommendations regarding the elaboration of an informational support system in decision making for improvement of the socio-economic system. The atypical solution model through the team of experts demonstrates the correctness of the approach, and solving the problems depends on the professionalism, desire and competence of the people involved in the realization.</p>
<b>Class no.</b>	14

**Practical Scientific Institute of  
Horticulture and Food Technology  
Republic of Moldova**

**MD.109.**

**Title**

**Process for producing semi-finished products of minced meat**

**Authors**

GRUMEZA Irina, MD; GUDIMA Angela, MD; MACARI Artur, MD; COEV Ghenadii, MD; CARTAȘEV Anatoli, MD.

**Institution**

**Public Institution Practical Scientific Institute of Horticulture and Food Technology**

**Patent no.**

MD 1282 Y 2018.09.30

**Description  
EN**

The invention relates to the food industry, namely to a process for producing semifinished products of minced mutton and poultry. The process for producing semi-finished products of minced meat comprises chopping the mutton and poultry meat in a meat grinder with sieve mesh diameter of 2-3 mm, mixing the meat in a mixer with nut grits, edible common salt, sodium bicarbonate, fresh garlic, ground black pepper, ground red pepper, food wheat fibers, hydrated in water in a ratio of 1:5 for 60 min at a water temperature of 20...25°C, and drinking water until a homogeneous mass is obtained, simulating the semi-finished products, packaging and sealing.

The elaborated procedure is implemented with in the Laboratory of Food Biotechnologies, Public Institution Practical Scientific Institute of Horticulture and Food Technology.

**Class no.**

3. Agriculture and Food Industry



**MD.110.**

<b>Title</b>	<b>Strain of <i>Saccharomyces cerevisiae</i> yeast <i>CNMN-Y-31/32/33</i> for the production of dry red wine in the wine center "Purcari"</b>
<b>Authors</b>	Taran Nicolae MD, Soldatenco Eugenia MD, Soldatenco Olga MD, Bostan Victor MD, Chiosa Nicolae MD, Cichir Liusia MD, Vasiucovici Svetlana MD.
<b>Institution</b>	<b>Public Institution Practical Scientific Institute of Horticulture and Food Technology</b>
<b>Patent no.</b>	Patent application No. 6447, 6448, 6449 / 18.03.2019
<b>Description</b> EN	<ol style="list-style-type: none"> <li>1. The invention relates to biotechnology, in particular to a local strain of yeast, selected in the wine center "Purcari" and is recommended for the production of red dry wines. To obtain red dry wines, a local yeast strain, deposited in the National Collection of Non-Pathogenic Microorganisms, with the assigned number CNMN-Y-31, is recommended.</li> <li>2. The invention relates to biotechnology, in particular to a local strain of yeast, selected in the wine center "Purcari" and is recommended for the production of white dry wines. To obtain white dry wines, a local yeast strain, deposited in the National Collection of Non-Pathogenic Microorganisms, with the assigned number CNMN-Y-32, is recommended.</li> <li>3. The invention relates to biotechnology, in particular to a local strain of yeast, selected in the wine center "Purcari" and is recommended for the production of white aromatic dry wines. To obtain white aromatic dry wines, a local yeast strain, deposited in the National Collection of Non-Pathogenic Microorganisms, with the assigned number CNMN-Y-33, is recommended.</li> </ol>
<b>Class no.</b>	3. Agriculture and Food Industry

**MD.111.**

<b>Title</b>	<b>Goat milk yoghurt with functional properties</b>
<b>Authors</b>	Cartășev Anatoli, Migalatiev Olga, Bogdan Nina, Cristina Popovici, Golubi Roman, Grumeza Irina, Caragia Vavil, Coev Ghenadie

<b>Institution</b>	<b>Public Institution Practical Scientific Institute of Horticulture and Food Technology</b>
<b>Patent no.</b>	Patent application No. 1835 / 25.10.2018 The invention relates to the dairy industry and can be used in the production of dairy products with probiotic and functional properties. The method of obtaining yogurt includes the normalization of goat milk, pasteurization, the introduction of autochthonous strains of lactic acid bacteria specially selected for the fermentation of goat milk <i>Lactobacillus bulgaricus</i> CNMN - LB-45 <i>Streptococcus thermophilus</i> CNMN - LB-79, fermentation during 3-4 hours till gel formation with pH 4,5 cooling to 30 ° C and applying CO <sub>2</sub> -extract from tomatoes, mixing, cooling to 4±2 °C and packaging. The method allows obtaining a product that provides the recommended dose in carotenoids and lycopene.
<b>Description EN</b>	
Class no.	3

**MD.112.**

<b>Title</b>	<b>Process of dry red wine with advanced content of biological active compounds</b>
<b>Authors</b>	Nicolae Taran, Eugenia Soldatenco, Victor Bostan, Nicolae Chiosa, Boris Morari, Olga Soldatenco, Liusia Cichir, Svetlana Vasiucovici, Rudoii Alexandru MD, Natalia Taran MD.
<b>Institution</b>	<b>Public Institution Practical Scientific Institute of Horticulture and Food Technology</b>
<b>Patent no.</b>	Patent application No. 1817/ s 2018 0081 / 01.08.2018 The invention relates to the wine industry, and in particular to a method for the production of dry red wine with a high content of biological active compounds. The method according to the invention provides for crushing and grape-separation of grapes with a minimum sugar content of 220 g / l in wort to produce pulp, with the addition of fresh seeds in the pulp in an amount (30 ... 50%), after which fermentation takes place for 15-21 days, and the process of fermentation is carried out under the pressure of CO <sub>2</sub> (50 ... 150 kPa) with mixing the fermented mash 6 to 8 times a day for 15 to 20 minutes, after which the fermented mash is removed and the mash is pressed. The result consists in intensifying the processes of extraction
<b>Description EN</b>	

## EUROINVENT 2019

from seeds and skins of phenolic and coloring substances, proanthocyanidins, resveratrol, rutin and quercetin, gallic and ascorbic acid and the enrichment of dry red wine with biological active compounds.

Class no. 3

### MD.113.

**Title**

Strain of *Saccharomyces cerevisiae* yeast *C-S60Tr-2 / STr-3.1* for the production of dry red wine in the wine center "Trifeshiti"

**Authors**

Taran Nicolae, Soldatenco Eugenia, Soldatenco Olga

**Institution**

**Public Institution Practical Scientific Institute of Horticulture and Food Technology**

**Patent no.**

Research

The invention relates to biotechnology, in particular to a local strain of yeast, selected in the wine center "Trifeshiti" and is recommended for the production of red dry wines. To obtain red dry wines, a local yeast strain, with the assigned number *C-S60Tr-2*, is recommended.

**Description EN**

The invention relates to biotechnology, in particular to a local strain of yeast, selected in the wine center "Trifeshiti" and is recommended for the production of white dry wines. To obtain white dry wines, a local yeast strain, with the assigned number *STr-3.1*, is recommended.

Class no. 3. Agriculture and Food Industry

**Tiraspol State University**  
**Republic of Moldova**

**MD.114.**

<b>Title</b>	<b>Inhibitor of steel corrosion in water</b>
<b>Authors</b>	Parșutin Vladimir, Șoltoian Nicolae, Cernișeva Natalia, Covali Alexandr, Coropceanu Eduard, Bulhac Ion
<b>Institution</b>	Tiraspol State University (Republic Moldova, Chisinau); Institute of Applied Physics of Republic Moldova; Institute of Chemistry of Republic Moldova
<b>Patent no.</b>	1257 C23F 11/08 MD/2017.07.07
<b>Description EN</b>	The invention relates to the corrosion protection of metals in water and can be used for corrosion inhibition in closed steel pipeline systems. According to the invention, claimed is the use of hexafluorotitanate-bis[di(dimethylglyoximato)-di(aniline)cobalt(III)] dihydrate compound of formula $[\text{Co}(\text{DH})_2(\text{An})_2]_2[\text{TiF}_6] \cdot 2\text{H}_2\text{O}$ , where DH – dimethylglyoxime monoanion, An – aniline, as an inhibitor of steel corrosion in water, in a concentration of 0.05...0.75 g/L.
<b>Class no.</b>	<b>9. Chemical and Textile Industry</b>

**“Ion Creangă” State Pedagogical University of Chisinau  
Republic of Moldova**

**MD.115.****Title**

**DIH 2.0: Digital Interactive Handbook for studying  
Romanian language and modern languages**

**Authors**

N.Balmuş, N.Burlacu, A. Bulat

**Institution****“Ion Creangă” State Pedagogical University of Chisinau****Patent no.**

PC Nr 5862 (17.01.2018) , O Nr 6292 (28.02.2-19)

The subject of the invention is an educational software designed and implemented in the Delphi 10 Seattle programming environment. It allows the user to convert the content of any classic static (pdf version) handbook into interactive editable digital format. This software imports the contents of the pdf file and converts it into double-page viewer with a browsing effect and navigation search, and selective zoom. DIH 2.0 has the following options:

- to include a large number of interactive elements: audio, video, images, documents, electronic presentations, web links;
- to create and incorporate a large number of interactive tests, frequently used in the process of learning the mother language and modern languages (phrases with loopholes, word ordering, dictations, syntax and phonetics exercises, correct answer tests, etc.)

**Description****EN**

The interactive elements in the handbook are viewed through the icons that are placed in the pages and on the fields. The administrator-user (the teacher) can edit both types of activity using the password. The simple user (student) can edit only the interactions from the handbook's fields.

The main elements of the invention are the DIH 2.0 options, which allow the creation of a Digital Interactive Handbook with static and interactive hundred percent personalized content.

To capitalize on the full potential of DIH 2.0, it is recommended that teachers collaborate with the members of developer group in the resource creation process (phonograms with expressive reading patterns, dictations, tests, etc.).

Technical parameters required for normal operation of DIH 2.0: Windows 7 or higher OS, 4GB RAM, 1.5 GHz processor frequency

Class no.

**10**



**National Agency For Public Health  
Republic of Moldova**

**MD.116.****Title**

Biodozimetry of the exposure at the ionizing radiation by micronucleus method.

**Authors**

Liuba Corețchi, Ion Bahnarel, Mariana Gîncu.

**Institution**

National Agency for Public Health

**Patent no.**

Nr.5379 of 09/06/2016.

**Description****EN**

The invention relates to the field of medicine, in particular to processes for the evaluation of the cytogenetic mutation by micronucleus test under the conditions of stressogenic factors, including increased ionizing radiation conditions. The work is intended for cytogenetic investigations in biodozimetry and includes methodology for determining the cell reaction to the action of ionizing radiation by determining the number of micronuclei. This presents a express method, estimating the level of patient exposure to stressogenic factors, including ionizing radiation within limited time, useful as a screening test in case of nuclear accident/incident.

## Class no.

4

**MD.117.****Title**

**Rhizopus Stolonifer Fungi Strain For Biodegradation Of Cobalt And Nickel Compounds**

**Authors**

COREȚCHI Liuba, PLAVAN Irina, BAHNAREL Ion,

**Institution**

National Agency for Public Health

**Patent no.**

Nr. 4486

**Description****EN**

The invention relates to Biotechnology and Environmental protection. The novelty consists in developing a new biotechnological process to reduce the risk of environmental pollution, based on the use of non-pathogenic microorganisms. It is proposed fungi *Rhizopus stolonifer* 67 CNMN-FD-18, which possesses the biodegradation of toxic compounds of cobalt and nickel.

## Class no.

4

**MD.118.****Title****Immune Status Assessment Process****Authors**

Corețchi Liuba, Bahnarel Ion, Gîncu Mariana

**Institution**

National Agency for Public Health

**Patent no.**

2667 C2 MD A 61 B 5/145

**Description****EN**

The invention relates to the field of medicine, in particular to processes for the evaluation of the immune status under the conditions of stressogenic factors, including increased ionizing radiation conditions. There is provided a process for the individual assessment of the immune status in patients exposed to stress factor associated with ionizing radiations, according to the correlation of sum of the populations of T-lymphocytes, including correlation of TCD4+ (T-helper lymphocytes) and TCD8+ (T-suppressor lymphocytes) populations to the TCD3+ (pan T-lymphocytes) x 100, investigated by using of imunofluoriscent imunoterapy or the biphenotypic method. The technical result consist in increasing of individual assessment of immune status in patients exposed to radiostresogen factor with detection of the correlation between expression of tension index of immune response and manifestation of clinical pathologies.

**Class no.**

1

**Junior Achievement Moldova  
IPLT,,Universul,,**



***EDUCATION IN MOLDOVA***

***By Angela Muntean  
manager of „Universul,, High School***

Moldova's education system was modeled on the that of the Soviet Union. Public education is mandatory for a period of eleven years, from six until seventeen. This is divided into kindergarten, primary school, elementary and secondary school. High schools are usually divided into technical and professional schools.

The official language of Moldova is Romanian with Russian also widely spoken. The educations system generally operates in Romanian, with additional classes in English or Russian or both.

In Moldova, there are 16 state and 15 private institutions of higher education, with a total of 126,100 students, including 104,300 in the state institutions, and 21,700 in the private ones. The number of students per 10,000 inhabitants in Moldova has been constantly growing since the collapse of the Soviet Union, reaching 217 in 2000-2001, and 351 in 2005-2006.

There are 6,200 faculty members in Moldova's universities, institutes and academies (on average 1 faculty member per 20.3 students). Out of these, only 2,700 (43%) hold PhD degrees, including 358 (5.8%) that also hold the highest academic degree: Habilitation. Moldovan faculty members usually teach around 20 hours per week (one of the highest workloads in the world).

52.5% of students major in economics, law, social sciences, or in some fields that the Moldovan Ministry of Education calls on its website "professional- formation- fields", 18.4% study engineering and architecture, 16.0% - education. There are a total of 90 specialities (majors) offered.

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101,100 students, or 80.2%, pay for their studies (from 2,000 to 7,300 Moldovan lei per year, i.e. from 120 to 430 euros per year). The state is trying to increase the number of places offered free of charge when students are admitted to public universities: there were 5,085 in 2001, 5,290 in 2002, 5,628 in 2003, 6,354 in 2004, 7,048 in 2005, 7,835 in 2006, but this rate (54% over 5 years) is lower than the rate of increase (65% over the same period) in the total number of places. 15% of the free of charge places are reserved, and distributed to candidates from low-income families. In an effort to support them, the state gives scholarships to 70% of students who occupy the free of charge places, i.e. to 14.4% of the total number of students. As of January 1, 2006, these scholarships are in three categories: 210, 230, or 270 Moldovan lei per month, i.e. 12, 14, or 16 euros per month respectively.

78.4% of students study in Romanian, roughly corresponding to its respective linguistic group, while 19.5% study in Russian (including members of other linguistic groups like Gagauz or Bulgarian).<sup>[4]</sup> Foreign languages became increasingly less popular in recent years: 1.8% studied in English or French during the 2010-2011 schoolyear, compared to 3.2% in 2006.

At present, the graduates get two types of diplomas: one type for fulfilling the curriculum and the *Licence* examination, and a second type, if in addition they write a Licence Diploma paper.

The Ministry of Education defines its strategic objective for higher education to be "the integration into the European common space for higher education, and active participation in its construction". In 2005 Moldova signed the commitment to implement the Bologna process agreements. In view of this, several changes have been operated since:

- reorganization from September 1, 2005 of the higher education into an undergraduate cycle of 3–4 years, and a master cycle of 1-2 year
- commitment to copy European laws and adopt them wholesale
- elaboration and implementation of a *Framework Plan* for the first cycle (undergraduate)
- elaboration of a new *Classification List of Specialities* for the undergraduate cycle
- elaboration of an *Implementation Guide* for a to be *National System of Transferable Credits*, and institutionalization of this system in all universities and colleges
- implementation of the introduction of an *educational record from* in a unique European format, as a supplement to the *Licence diploma*

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The Ministry of Education's declared objectives in taking these actions are:

- improvement of the quality of the country's higher education
- increasing the national and international mobility of students and faculty
- taking and implementing "European university education values" into the educational system of Moldova

The quality of the higher education has been declared a priority. In this context, a prime priority is declared to the implementation of the *National Framework of Qualifications for Professional Formation*, which will determine the "educational finalities and competences", the "compulsory minimum of realization in higher education", and will somehow facilitate the rise in "the quality of the preparation of graduates for the national economy", and will also somehow contribute to "ensuring the continuous rise of the quality of education".

Universities and colleges are told to start creating own "systems of internal management of quality", with the aim of "organizing the internal process of ensuring the quality, in accordance with national standards, and the demands of external evaluation systems".

The National Council on Accreditation and Attestation is an organization that approves the examination programs for doctoral students, confers scientific degrees, and scientific and pedagogical ranks. The Council publishes online all PhD theses that are elaborated and defended in Moldova.

*Ambassador J.A.Moldova*

*Web-page*<https://jamoldova.org.md/index.php/en/>

*Contact Person: Silvia Scortescu*

*Trainer School Companies J.A. Moldova*

*J.A. Project with Hight-School „Universul,,*

*Adress: Hincesti 136*

*Email:silvia.scortescu@yahoo.com*

*Phone number:+373 798 97 247*

*Web-page:*<https://www.liceul-universul.md/>

**Junior Achievement Moldova  
IPLT,,Universul,,**

**MD.119.**

**Title**

Nutz and Elza

**Authors**

Adelina Bivol

**Institution**

IPLT,,Universul,,

**Description EN**

Nutz and Elza - orthopedic nut-based, used in the back during the lessons, is comfortable in operating at school, absolutely healthy.



**MD.120.**

**Title**

Mop-Flat

**Authors**

Levandovici Nichita

**Institution**

IPLT,,Universul,,

Innovation cleans the floor in the house, it is intended to be used especially for the elderly persons or for those with motor problems, innovation helps and performs the housewife's work in the house by working desolvently.

**Description EN**



**MD.121.**

**Title**

Point-sale

**Authors**

Scortescu Marius-Silviu

**Institution**

IPLT,,Universul,,

**Description EN**

Multifunctional advertising painting by Mall Info- Stand it is a pad that promotes products in three directions, front, back and back- in, also can,t be used

for open spaces.



**MD.122.**

**Title**  
**Authors**  
**Institution**

**Bibet-Cosmetic**  
**Florensia Balaur**  
**IPLT,,Universul,,**

This is a cosmetic support placed in the car that takes little place and is in miniature, is very convenient and useful for ladies, gentlemen also it is removable and useful everyday.

**Description EN**



**MD.123.**

**Title**  
**Authors**  
**Institution**

**Back –Viv**  
**Agrici Gheorghe**

This purpose work requires the use of solar energy placed on an electrical device that automatically loads the device, author demonstrate the ability to save electricity energy in exchange for solar energy, that is free.

**Description EN**



**MD.124.**

**Title** School Admission Traking

**Authors** Nicu Frumusache

**Institution** IPLT,,Universul,,

**Description EN**

This IT/ project where author reserch presents students' grades also and semestrial result and the programe show the yearly results, that are identified in this platform, The aims is to identify the child with absences and school failure.

**MD.125.**

**Title** Deco - Point

**Authors** Barbuta Valeria

**Institution** IPLT,, Universul,,

**Description EN**

This is a decoration from recyclable products, glass, plastic, author made important to decorate house by original pieces for Human- Ego.



**MD.126.**

**Title** MaGno-glasses

**Authors** Ursu Cristina

**Institution** IPLT,,Universul,,

**Description EN**

This innovation are special because this type of glasses helps the person avoid stress and fatigue during the day, treats head migraines, relaxes and improves the peripheral circulation of the blood, by medical magnets.





**MD.127.**

**Title**

**Paint-Light**

**Authors**

**Cristina Bivol**

**Institution**

**IPLT,,Universul,,**

Sunlight painting, used at night, also it is used as lighting the room in the evening childs rooms whos afraid at night and decorative work- art in the house.

**Description EN**



**MD.128.**

**Title**

**Robo-wood**

**Authors**

**Muntean Sandu**

**Institution**

**IPLT,,Universul,,**

**Description EN**

Wooden toy works with solar batteries, is also used at night like a lamp, the wheels of toy illuminate the room from solar batteries .



*Junior Achievement Moldova member J.A. Worldwide*

*Author: Silvia Scortescu-Ambasador J.A. Moldova*

JA (Junior Achievement) Worldwide is a global non-profit youth organization founded in 1919 by Horace A. Moses, Theodore Vail, and Winthrop M. Crane. JA works with local businesses, schools, and organizations to deliver experiential learning programs on the topics of work readiness, financial literacy, and entrepreneurship to students from ages 5 to 25.

Boys' and Girls' Bureau of the Eastern States League was founded in Springfield, Massachusetts, in 1919 to help educate young people moving from rural America to the country's booming cities about the means of production and free enterprise. The following year, the organization's name was changed to the Junior Achievement Bureau. The name was modified in 1926 to Junior Achievement, Inc.

Following World War II, the organization grew from a regional into a national organization. In the 1960s, JA began its growth into an international organization.

For more than 50 years, the organization was known mostly for the JA Company Program, an after-school program through which students form companies, sell stocks, produce and market a product, and sell it in their communities and globally. The student companies are mentored by volunteer advisers from the business and tech communities. In 1975, Junior Achievement introduced its first in-school program, Project Business, featuring volunteers from the local business community teaching middle school students about business and personal finance.

Today, JA Worldwide is one of the world's largest organization youth-serving organizations, dedicated to giving young people the knowledge and skills they need for employment and entrepreneurship. JA programs are delivered by corporate and community volunteers and provide relevant, hands-on experiences that give students knowledge and skills in financial literacy, work readiness, and entrepreneurship. JA annually reaches more than 10 million students in more than 100 countries around the world. Programs are delivered by more than 450,000 JA volunteers.

JA Worldwide has regional offices in Junior Achievement USA, JA Middle East and Africa (INJAZ Al-Arab), JA Europe, JA Asia Pacific, JA Americas, and JA Africa.

Several other organizations have joined JA Worldwide, such as Young Enterprise in the UK, INJAZ in the Middle East, Prestasi Junior in Indonesia, and Vlajo in Belgium.

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Beginning in 1944, Junior Achievement organized an annual national conference, known as the National Junior Achievers Conference, NAJAC, to bring together student representatives of local programs to participate in contests. In 1949, the organization began allowing conference delegates to elect national leadership to play an active role contributing to program development, increasing public awareness and supporting fundraising. From 1944 to 1961, conferences were held in New Jersey, West Virginia, Ohio, Michigan, Pennsylvania, and Indiana, before finding a home on the campus of Indiana University in Bloomington, Indiana through the mid-1990s.

### National Conference Presidents

From its founding in 1919 until 1962, JA was managed by volunteers from the business community. In 1962, the organization hired its first, full-time, paid president.

JA programs for elementary, middle, high school, and college students are designed to "help prepare young people for the real world by showing them how to generate wealth and effectively manage it, how to create jobs which make their communities more robust, and how to apply entrepreneurial thinking to the workplace."

History and Mission Junior Achievement Moldova, part of Junior Achievement Europe.

- Junior Achievement is a non-governmental organization whose mission is to motivate and prepare the younger generation to assert a successful market economy.
- Junior Achievement is activated in Moldova since 1995 and is a member of JA Worldwide [www.ja.org](http://www.ja.org) and of the Regional Centre in Brussels, JA-YE Europe [www.ja-ye.org](http://www.ja-ye.org). JA Worldwide is the largest and most dynamic organization oriented to economic and entrepreneurial education, being present in 123 countries.
- From the organization's registration, over 195,000 students and 1800 teachers attended the JA Moldova programs of entrepreneurial training. In collaboration with the Ministry of Education of the Republic of Moldova and the Foundation "Sturza Family", JA Moldova is offered in 130 schools and colleges in the country, where about 8000 students from the 1<sup>st</sup> to the 12<sup>th</sup> grade benefit both from classroom teaching activities and various extracurricular activities, such as economy contests, school fairs, summer camps, etc.

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- In economical education programs offered by Junior Achievement the teacher and the pupils learn by actions. By the activities of "learning by doing" held in class and by the interaction with volunteer consultants from business community, young people acquire essential skills for life, experience unique opportunities to participate in international competitions of the programs, belonging to educational and professional global network. In present the organization's educational offer contains 19 programs for all the age levels from 1-12.
- JA economic education programs cultivate thinking applied to reality, a positive attitude towards life, sense of initiative and involvement in community life. Through computer simulations or in the classroom, role play scenarios, doing case studies, students learn experiencing real life roles: consumer, employee, entrepreneur.
- JA Moldova can be implemented in one of the following ways:
  - Extracurricular
  - Auxiliary at compulsory courses
  - During the class at school
  - Optional class
- Junior Achievement Moldova offers:
  - TEACHERS:
    - Free annual trainings (trainings of formation and improvement) for teachers who are involved in economic and entrepreneurial education programs or those who want to be involved in JA programs Moldova;
    - Exchange of experience with European partners in project based travel (all expenses are paid by the organization);
    - FREE teaching support (books, pupil's copybook, teacher's guide, teacher's envelope, games, posters).
    - Curriculum developed by JA Moldova and approved by the Ministry of Education of RM;
    - The opportunity to participate in the events organized by JA Moldova for pupils nationally and internationally.
  - PUPILS:
    - The opportunity to participate in international competitions within the programs (online stimulation titan, European Company of the Year Competition) ;
    - Belonging to a global educational and professional network;
    - Students acquire essential skills for life, unique experiences;
    - Support for teachers;

## EUROINVENT 2019

- The opportunity to participate in national events for young people in the program (National Company of the Year Competition, Economical contest, Job Shadow Day, innovation camp, Meetings with business representatives:
- Moldcell
- StarNet
- Orange
- Metro Cash and Carry
- MAB-Moldova
- Agroindbank

**Junior Achievement Moldova** changes mentality, creates a favorable environment for students with a transition from Idea to Business.

# Philippines

by *Manila Young Inventors Association*

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## PH.1.

### Title

**EnerSave**

### Authors

Daniel Lee E. DE GUZMAN, John Luis L. TOLENTINO, Zosima V. AUMENTADO, Ma. Jarvie B. LLEGO, Ma. Chat Donna V. OFILAS

### Institution

**Manila Young Inventors Association (MYIA)**

N/A

### Description EN

EnerSave is an IoT-based fire protection and energy home saving device to save energy from appliances that are still running even not in use. EnerSave is a device that can manipulate appliances to turn on and off at such distances in order to conserve energy and save time in turning on and off of the appliance through automation rather than manually.

Class no.

2

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## PH.2.

### Title

**THIexfan**

### Authors

Mon Andrei C. TAGALICUD, John Luis L. TOLENTINO, Zosima V. AUMENTADO, Ma. Jarvie B. LLEGO, Ma. Chat Donna V. OFILAS

### Institution

**Manila Young Inventors Association (MYIA)**

### Patent

N/A

### Description EN

THIexfan is an automated exhaust fan which aims to exhaust air in a room to lower the temperature which is programmed to turn on if the temperature is above 30 degrees Celsius with the humidity index of above 80 and turn off if the temperature is below 29 degrees Celsius with the humidity index of below 79. THIexfan prototype has lower energy consumption as compared to the usual AC unit and lowered temperature as compared to a usual electric fan.

Class no.

2

## Poland

Represented by Eurobusiness-Haller

## PL.1.

## Title

**Innovative 3D electrode for application in new generations of solar cells**

## Authors

Rafał Pietruszka, Bartłomiej Witkowski, Monika Ożga, Piotr Sybilski, Marek Godlewski

## Institution

**Institute of Physics of the Polish Academy of Sciences**

## Patent no.

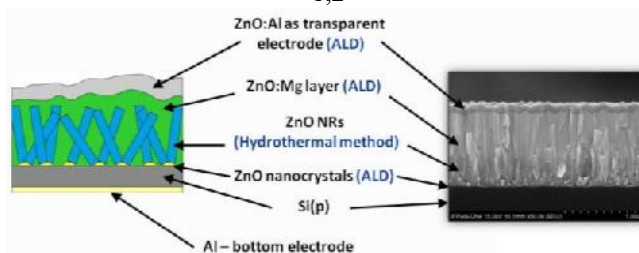
PL229128, PL227744

Description  
EN

We have developed innovative 3D electrode for photovoltaic cells based on nano-structures of zinc oxide, grown by microwave assisted hydrothermal method, and zinc oxide layer with addition of magnesium and aluminum, obtained by ALD method. It can also be applied as n-type partner with p-type silicon. This cell architecture is based on ZnO (n) - Si (p) junction. In addition, ZnO:Mg layer is applied on ZnO nano-rods (type n partner), by the ALD method, which additionally absorbs the ultraviolet range. Inexpensive type n silicon substrates were used as the base. Zinc oxide, with dopant of aluminum, was selected as the top transparent conducting electrode, which is the great alternative to commonly used ITO. Obtained photovoltaic cells demonstrated, at the early stage of optimization, the efficiency of 14 %.

## Class no.

1,2



## PL.2.

## Title

**Monitoring system of climatic conditions and UV radiation**

## Authors

Bartłomiej Witkowski, Aleksander Wittlin, Monika Ożga, Piotr Sybilski, Marek Godlewski

## Institution

**Institute of Physics of the Polish Academy of Sciences**

**Patent no.**

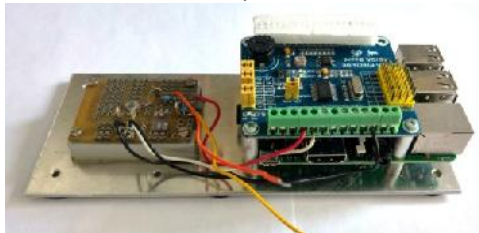
PL 225411

**Description EN**

The subject of the application is a system for monitoring conditions and UV radiation. The most important element of the system is the high sensitivity UV detector. The original sensors invented at the Institute of Physics of the Polish Academy of Sciences is characterised by high sensitivity, durability, linearity of photoconductivity in relation to the intensity of UV radiation and, what is extremely important, insensitivity to visible light. This latest feature greatly simplifies sensor design eliminating the need for filters. Autonomous sensor stations require only 5V /0.7 A DC power supply, either from the municipal network, through the wall-plug power supply, or, in the summer period, from photoelectric cells and batteries. The station can also contain a wide range of other environmental sensors, for example temperature, humidity of gases, dust, etc., connected either to the transmitter, or in the case of sensors with its own digital interface, to the I2c bus / serial port of the microcomputer.

Class no.

1,4



**PL.3.**

**Title**

**Roadheading mining machine BH3000B – HYDKOM 75**

**Authors**

Bartosz Polnik, Zdzisław Budzyński, Przemysław Deja, Wojciech Kurpiel, Grzegorz Jankowski, Piotr Kowalski

**Institution**

**Institute of Mining Technology KOMAG, HYDROTECH S.A.**

**Patent no.**

Patent application No. P.429173

**Description EN**

On the Polish and foreign markets there are a number of companies manufacturing roadheading mining machines. All of these solutions are powered by an internal combustion engine or by electric motor supplied



from the mine network via a trailing cable. In addition, it is possible to control them from the desktop located at the operator's position. The BH 3000B - HYDKOM 75 roadheading mining machine is the first device in the world in which the internal lithium battery cell system is used to supply power as well as it can also be supplied from the external mining network via an electric wire. The system of internal power supply from battery cells was designed in a way that allows it to be charged / recharged at any place of operation from the external mining network without a need for an additional external charging device. The safety of the battery cell operation is supervised by the developed and implemented proprietary battery management system (BMS), in which the active balancing system is used. This solution of cell balancing has not been applied in the world so far. In addition, both local control from the control panel and remote control via radio was introduced in the device for the first time.

**Class no.**

3

**PL.4.****Title****Multimodal nanoparticles for neurodegenerative therapy****Authors****WULS-SGGW: W. Lipinski, J. Olszewski, P. Kielbik, M. M. Godlewski****Institution****IP PAS: J. Kaszewski, J. Rosowska, M. Godlewski  
Warsaw University of Life Sciences – SGGW  
Faculty of Veterinary Medicine****Patent no.****P. 401933, PL.411832, PL.411831**

The key of invention is development of novel, biocompatible oxide nanoparticles for the transfer of drugs into the brain tissue. Designated target of the invention is adjuvant therapy in the neurodegenerative (Parkinson and Alzheimer) diseases and therapy of brain tumours.

High-purity nanoparticles are produced using environmentally-friendly, low-energy method leaving no chemically aggressive waste.

**Description EN**

Nanoparticle-drug composite delivered orally undergoes efficient uptake from the gastrointestinal tract, is delivered by blood to the brain, where within 24 h it is transported through blood-brain barrier into the nerve tissue. Afterwards nanoparticle-drug complex disassociate and drug is deposited, while nanoparticle carriers undergo biodegradation.

The industrial part of the process is already developed and tuneable for high-scale production and the know-how is patent-protected.

**Class no.****4**

## Poland

Represented by

*Association of Polish Inventors and Rationalizers*

*Stowarzyszenie Polskich Wynalazców i Racjonalizatorów. SPWIR*

### PL.5.

<b>Title</b>	<b>The method of producing multi-component fertilizer with controlled release of ingredients</b>
<b>Authors</b>	Maciej Balawejder, Natalia Matłok , Józef Gorzelany , Dorota Antos, Wojciech Piątkowski, Roman Bochenek, Mateusz Przywara, Maksymilian Olbrycht, Michał Kołodziej, Piotr Antos , Krzysztof Kania , Grzegorz Witek
<b>Institution</b>	<b>Dr Green Sp. z o.o., Uniwersytet Rzeszowski, Politechnika Rzeszowska im. Ignacego Łukasiewicza</b>
<b>Patent no.</b>	ZP P.429318

The subject of the invention is a method for producing a multicomponent fertilizer, preferably in the form of a granulate, in which controlled release of nutrients is obtained by appropriate selection of components. The raw material for the production of fertilizer is post-slaughter waste, especially pork and beef bone tissue, which is thermally processed and crushed to a loose form. These raw materials are fortified with protein-rich isolates, especially those made of food industry waste, and then subjected to granulation. The proposed solution eliminates the need to pre-process the protein additive, because the hydrolysis effect is obtained by the appropriate selection of components of the fertilizer product. Thermally treated bone waste suspended in an aqueous solution shows a high pH; under these conditions the protein decomposes, releasing nitrogen in the ammonium form and free amino acids. The produced fertilizer product consisting of thermally processed bone waste with the addition of protein shows high stability in the air-dry state, whereas after application in the soil under the influence of moisture, the proper process of protein decomposition and release of nutrients begins. When the proteins are completely decomposed, the remaining fertilizing ingredients contained in the granules are used, i.e. phosphorus compounds and micronutrients. The use of the proposed fertilizer product has effects observed in the early stages of plant growth and development

**Class no.**

3

**PL.6.****Title****IBIS EOD/IEDD and Combat Robot****Authors**

Adam AFTYKA, Adam ANDRZEJUK, Rafał CZUPRYNIAK, Łukasz DUDEK, Sławomir KAPELKO, Piotr KOCIEL, Sebastian PAWŁOWSKI

**Institution****Industrial Research Institute for Automation and Measurements PIAP****Patent no.**

P-389296; P 389867

**Description EN**

IBIS is a robot for EOD/IEDD and combat applications. The robot is equipped with a six wheel mobile platform. Each wheel has independent drive. The front wheels are mounted on a common axle, which can rotate within a limited range around the longwise axis of the robot. The remaining wheels are linked in pairs, on each side of the robot. The pairs of side wheels can rotate within a limited range around the common crosswise axis of the robot. Such suspension architecture ensures the contact of all wheels with the ground in most situations and consequently, easy movement on uneven surfaces, good stability during movement and ideal distribution of torque to each wheel. Special solutions used for driving the manipulator ensure fluent movement of each segment within the entire speed range. The robot can be controlled either over a radio connection or via a fibre optic cable, from a suitcase control panel or with a very light-weight remote controller. In addition to the conventional view from one of the cameras (Standard mode), the operator can display views from many cameras on the control panel (QUAD or PIP modes). The LCD monitor displays also data from robot's sensors, in digital and graphic format. A negotiation system is integrated with the operator's control panel. The robot is compatible with different additional equipment: pyrotechnical disrupters, M16 machine gun, 40 mm grenade launcher, antitank missile launcher, chemical and radioactive contamination sensors, bus bar for remote detonation of explosives, barbed wire cutters, drills, recording devices and many others.

**Class no.**

12

**PL.7.****Title****Modification kit for the hybrid electric-manual wheelchair drive system****Authors**

Lukasz WARGULA, Bartosz WIECZOREK, Mateusz KUKLA, Dominik RYBARCZYK, Arkadiusz Kubacki

**Institution****Poznan University of Technology****Patent no.**

P.427855

**Description EN**

The subject of the invention is a modification set of a drive system for a hybrid electric-manual wheelchair. The solution according to the invention uses an additional module to add an electric drive while ensuring no modification of the manual drive components of the trolley (pushrim connected directly to the rim of the drive wheel as in a classic trolley). Allows you to maintain the autonomy of the functions of the classic hand truck without support or electric trolley. Provides independent control using two throttle controls and two independent disc brakes. The modular hybrid electric-manual drive system is the option of retrofitting the wheelchair after disassembly of the drive wheels, maintaining the base frame of the trolley, front wheels (self-aligning), parking brake pressures and footrests. The components are mounted to the basic frame of the wheelchair. The assembled components are: drive module, control module and anti-rotation module. The wheelchair can perform motion in three working modes: like a classic electric wheelchair, in the mode of reducing the impact of external resistance and in the acceleration assist mode. The last two modes are a function supporting the manual drive. The mode of reducing the external resistance in its operation should reduce the resistance resulting from the change in the inclination of the road on which the wheelchair moves. The acceleration assist mode is to compensate for the loss of speed of the truck during the return phase.

**Class**

12

**PL.8.****Title****Innovative manufacturing technology of components of machine and equipment from iron-based amorphous materials****Authors**

Wirginia Pilarczyk, Aleksandra Malachowska , Andrzej Ambroziak

**Institution****Wroclaw University of Science and Technology****Patent no.**

-

**Description EN**

The presented invention is a technology of manufacturing amorphous elements with the use of generative technique - selective laser melting (SLM ). Iron-based metallic glasses are a promising group of materials, which is not widely used due to problems with obtaining the necessary cooling rates in case of complex structures. The proposed technology - SLM - is characterized by a small liquid metal pool ( $<100 \mu\text{m}$ ) and thus allows to achieve a cooling speed of 104-106, which is much higher than those needed for amorphization. At the same time, the incremental character of process allows to obtain elements of almost any shape and size. However, the problem is the large thermal gradients, which in combination with the brittleness of most metallic glasses result in cracks or even delamination in the manufactured elements. In addition, there is heating of already manufactured layers by subsequent layers. Therefore, in order to obtain satisfactory results it was necessary to optimize such factors as: input material, thickness of sintered layer, laser speed and power, distance between individual exposures of the beam or scanning speed (laser beam movement). These parameters directly influence the energy density that is delivered to the sintered powder layer and which determines the structure, mechanical properties and quality of the surface.

**Class**

6

# Portugal

By

*Inventarium-Srd.Com*

## PT.1.

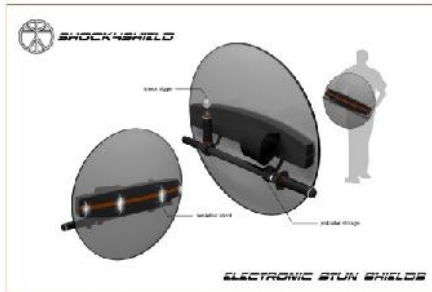
**Title** SHOCK4SHIELD  
**Authors** Fernando Maldonado Lopes  
**Institution** *Inventarium-Srd.Com*  
**Patent no.** National Application

## Description EN

Is essentially an electrified riot control shield, designed to provide added protection for Police and military personnel in hazardous crowd control situations. It can be used like any normal shield or activated to provide a less-than-lethal immobilizing shock by the user.

Class no.

12



## PT.2.

**Title** JET4BATON  
**Authors** Fernando Maldonado Lopes  
**Institution** *Inventarium-Srd.Com*  
**Patent no.** Pending

## Description EN

Professional Police & Army  
Anti Riot Tactical Batons  
Exclusively designed to:  
\*Peace Maintenance  
\*Law Enforcement & Prison Control  
With incorporated Red Pepper or Tear Gas canister and Front Impact Shock Absorber System; extra protection for police and military personnel in hazardous crowd control situations, able to reach 10 meters of effective defensive range.

Class no.

12

## Russia

### RU.1.

<b>Title</b>	<b>Optical device for contactless measurement of the displacements of control object surfaces</b>
<b>Authors</b>	Miroshnichenko Igor Pavlovich*, Parinov Ivan Anatolievich**
<b>Institution</b>	*Don State Technical University, Rostov-on-Don, Russia, **Southern Federal University, Rostov-on-Don, Russia
<b>Patent no.</b>	Patent RU No.No. 2606245/2017, 2512697/2014, 2343402/2009. Certificates for computer programs inventions RU No.No. 2018664987/ 2018, 2017614900/2017, 2017614861/2017, 2017614764/2017, 2017614715/2017, 2017614710/2017.
<b>Description EN</b>	It is designed for high-precision contactless measurements of the linear and angular displacements of control object surfaces by diagnosing the state of construction materials and studying the strength properties of constructions by acoustic methods of non-destructive testing as part of stationary and mobile diagnostic stations in mechanical engineering, aircraft building, shipbuilding, etc. It is developed on the base of using the modern laser technology and new optical interference methods. It implements a new interference measurement method, namely the method of highlighting the surface of the test object. It allows one to significantly expand the scope of application by providing the ability to change the range of measured values of displacements in the measurement process without changing the quantitative and qualitative composition of the optical scheme based on the control of the curvature of the wave front of optical radiation, reflected from the surface of the test object. It also allows one to significantly reduce up to 40% the time and labor involved in the preparation and performance of the contactless measurements of the linear and angular displacements of control object



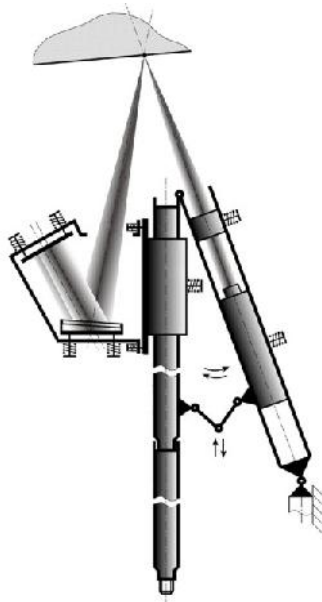
surfaces.

It realizes completely all the advantages of high-precision optical interference measuring instruments for solving scientific and practical problems as part of mobile diagnostic systems.

It is protected by 3 patents of the Russian Federation for inventions and 6 certificates of the Russian Federation on the state registration of computer programs.

Class no.

5,6,7



**RU.2.****Title**

**Atom-economical organotin reagents as the precursors of biologically active substances and hybrid materials**

**Authors**

A. S. Levashov, D. S. Buryi, A. R. Chikava

**Institution**

**Kuban State University, Krasnodar, Russia**

**Description EN**

As a practical application of tin tetraalkynilides, we have developed new method for preparation of hybrid materials, for instance, transparent conductive films used in energy-saving coatings fabrication. AFM study of the conductive tin oxide films have shown dramatic difference in nanostructures depending on coating composition, what offers great possibilities for predetermined-properties materials formation. For example, we have developed efficient techniques for application of transparent conductive coatings, which were used to create smart panel prototype. Obtained smart glass can be utilized as window panes and interior partitions. In addition, smart panels feature anti-icing function (due to self-heating) and can be used as a screen for video playback.

Smart panels are a well-known technological product. However, the method for their formation we propose differs fundamentally from the currently existing ones. With our new technique for smart panels production, we have managed to improve their characteristics and reduce their cost substantially.

**RU.3.****Title**

**Program for calculating the effect of the D/H ratio on the occurrence of open states in a double-stranded DNA molecule**

**Authors**

Drobotenko M.I., Svidlov A.A., Petriev I.S., Elkina A.A., Barishev M.G., Dzhimak S.S.

**Institution**

**Kuban State University, Krasnodar, Russia**

**Description EN**

The program is designed to calculate the probability of open states between pairs of complementary nitrogenous bases in a double-stranded heterogeneous DNA molecule, when all bonds in base pairs are protium. And also to calculate the change in this probability when replacing protium bonds by deuterium ones according to

a given algorithm. The results can be used for theoretical studies of the effect of deuterium on the dynamics of DNA molecules.

**RU.4.**

**Title**

**Program for stabilization of non-anthropomorphic robot with external computer based on ROS and Matlab Simulink**

**Authors**

Ryadchikov I.V., Sinitsa S.G., Sechenev S.I., Mamelin Y.V., Gusev A.A., Prutskiy A. S.

**Institution**

**Kuban State University, Krasnodar, Russia**

The program can be used in robotics to control the manipulator on a robotic platform with a system of dynamic stabilization. A distinctive feature of the program is sending commands to external computers in the ROS (Robot operating system) format, which allows transferring control for external Matlab Simulink applications. The UDP protocol guarantees achieving an acceptable stable signal refresh rate of 100 Hz.

**Description EN**

The program provides:

- sequential polling of 1 to 255 servos using the Dynamixel protocol;
- provision and storage of position data;
- servos and platforms to external computers;
- receiving and executing commands from external computers on a robotic device;
- continuation of autonomous work in the absence of external commands.

**RU.5.**

**Title**

**Automatic Control By Nonpil Ship On An Air Pillow**

**Authors**

V.V. Salnikov, Supervisor: Kanov L.N.

**Institution**

**GBOU CDOD - Small Academy of Sciences, Sevastopol, Russian Federation**

The increased circle of tasks for nonpilot means of transport (NMT) requires development of the systems of automatic control, independently accepting decision at the change of parameters of environment and answering the requirements of operative change of technological task. Therefore creation of NMT, possessing high manoeuvrability and elements of

**Description EN**

intellect, topically and is priority direction of development of modern technique.

The purpose of work is a construction of methods of management nonpilot ship on air pillow for motion on the operatively set trajectory with the set speed.

For achievement of the set purpose in a project considered and decided next tasks. On the basis of laws of Newton for forward and rotatory motion the mathematical model of ship on air pillow is built . The method of operative task the trajectory of motion is certain on the basis of reper points. With the use of theory of differential inversion the new method of traffic of NMT control is developed on the set trajectory. For the first time is certain managing influences for realization of motion on the set trajectory as tractive of engine force NMT.

A scientific job performance is presented by new methods managements of NMT, which take into account complete properties of model and will realize motion of NMT on the set trajectory with the set speed.

The most perspective application of the developed methods of management of NMT domains are freight transportations on certain, beforehand set routes, reconnaissance and battle ship on air pillow.

## Saudi Arabia

*Represented by*

*Highly Innovative Unique Foundation (HIUF)*

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**SA.1.**

**Title** Grill Skewers in Tube

**Authors** Najia Alzanbagi

**Institution** HIUF

**Patent no.** -

**Description EN**

It is a tube with tight transparent cover, the tube is divided into two chambers, the first one is for minced meat and it has a squeeze handle, the second chamber has middle cavity that the barbecue skewer is inserted in. The squeeze handle of first chamber make separate skewers one by one which is kept in a specific tray with transparent lid until the whole meat is finished that to be ready for the barbecue process.

**Class no.** 14

## Singapore

*Represented by  
Citizen Innovation*

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**SG.1.**

**Title**

**GEMS – Green Estate Management System**

**Authors**

Joleen Seto, TAN Wei Kok

**Institution**

**Citizen Innovation**

**Patent**

Pending

**Description EN**

Green Estate Micro-management System (GEMS) changes user behavior through developing awareness of green habits. GEMS monitors energy usage from the fuse box and send it to the cloud for analysis. To communicate with the users, an AI personal assistant is connected to messenger and help users reduce their green footprint.

Class no.

Class no. 2,1,7

## Spain

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**SG.1.**

<b>Title</b>	<b>Electromagnetic Screw Driver DEXTO + PLUS</b>
<b>Authors</b>	Francisco Miranda de Rojas
<b>Institution</b>	<b>FICTIONS &amp; INVENTIONS, S.L</b>
<b>Patent</b>	OEPM
	Electromagnetic tool to fix screw without risking to loos it.
<b>Description EN</b>	Very helpful in screwing into difficult hole position just pressing a small switch situated in the handle. Applications: Electrical 3V Battery tool.

Class no.

14

## Sudan

### SD.1.

**Title** The smart stick  
**Authors** Abdalbasit Abdalla  
**Institution** Smart Care Tech  
**Patent** Pending

### Description EN

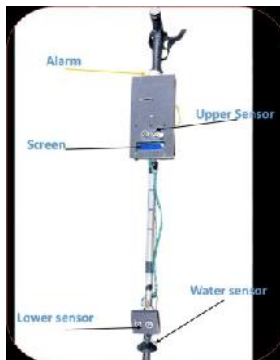
The smart stick is a very useful tool for the individuals with sight impairment. The stick is designed to solve three major problems, objects and obstacles alarming, calling for help if needed, and alarming system in case that the stick is lost. There are several important parts that make the components of the device, monitor screen, the virtue of message and notifications, the acoustic alarm and vibration, alarming whistle, in addition to sensors for low and high objects. This innovation is absolutely useful, comparing with the old technology that available now, and it found to be reliable, and cost effective. Characterized as strong, lightweight, and flexible, Water proof, and accommodate all the conditions of nature, can be used for the disabled (kinaesthetic and auditory, visual, even the elderly), because of the technical keep pace with the progress in age and all types of disability. Economically competitive ,Technologically possible

The stick cost drops to 30 ,Increase the level of protection for the blind handicap to 75%

More effective than the old technology >by 97% .

Class no.

12





**SD.2.**

**Title**

Comprehensive Smart Waste Disposal System (CSWDS)

**Authors**

Abdalbasit Abdalla

**Institution**

**Smart Care Tech**

**Patent**

Patent application No. 3916/2018

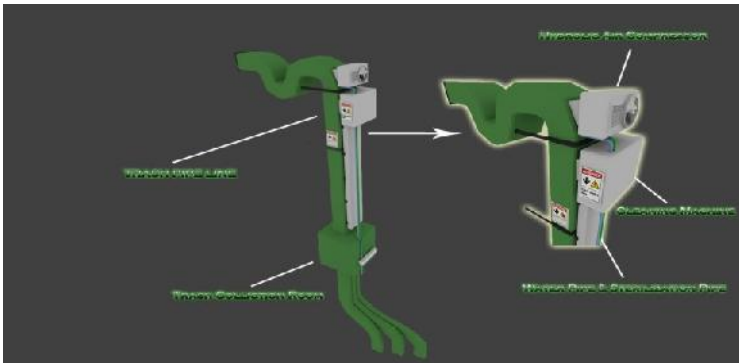
**Description EN**

This Invention Is a very useful and modern tool for the complete disposal of waste or garbage from the house to the assembly point and the actual phase of disposal and used modern technology and sensors and automatic self-control systems . To transfer, sorting and handling waste disposal

This system is designed to solve the main problems of transportation, sorting and disposal of waste. The system works on transporting waste from the upper floors of the building through pipes (divided by types of waste to facilitate the sorting process) to the first collection site of waste And move automatically to a larger collection assembly location in a network ,Through an automatic transmission line, from which it moves to the main network of the residential complex and from there to the main civil network. Thus, the waste is collected and transferred from the local civil network to the main network or terminal station in the ground floor.The system consumes energy from waste analysis

Class no.

2



**SD.3.**

**Title**

**Modern Medical Cupping Device**

**Authors**

*Kheder Hamed gallab, Ali Al mohammed , Basim Hamid*

**Institution**

**Smart Care Tech**

**Patent**

Patent application No. 3820/2018

**Description EN**

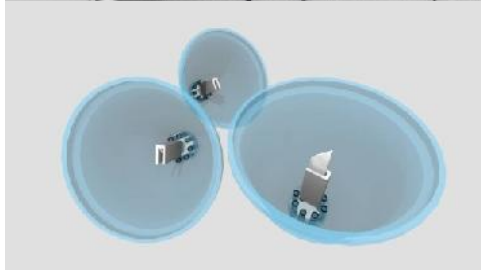
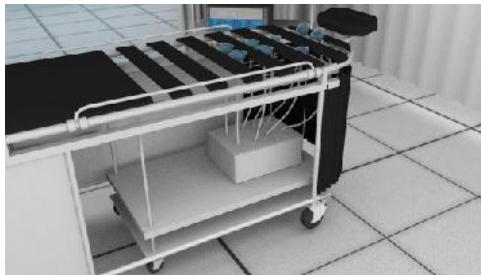
It is a modern device in which the places of cupping are accurately specified in human body through digital screen through which the cupper is dealing. The Modern Medical Cupping device is composed of self-air compressor connected to with a group cupping sets of different sizes provided, at the edges. With disinfectant materials and local an aesthetization in which there is a lance to be put at the places where the cupping shall be carried out; and connected with each others of modern auto – control to perform the process of cupping.

The devise is also provided with small cameras that help in the process of the cupping.

The Modern Medical Cupping Device is characterized by high accuracy in specifying the places of cupping and medical safety

Class no.

4

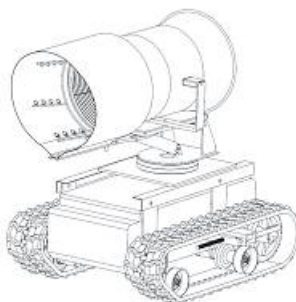


## Taiwan

Represented by WIIPA

### TW.1.

<b>Title</b>	<b>A SENSING REAL-TIME MONITORING NETWORK SMOG ELIMINATE MOBILE PLATFORM</b>
<b>Authors</b>	Fa-Shian Chang, I Chang Hsu, Jyh-Haw Chen, You-Yang Yang, Yuan-Ren Zheng, Wei-Heng Chan
<b>Institution</b>	Cheng Shiu University and Chung Shan Industrial & Commercial School
<b>Patent no.</b>	M570403
<b>Description EN</b>	The main purpose of this system created to provide a robotic device to reduce haze. The use of water mist to adsorb PM2.5 in the air and harmful fumes to reduce the air in the air to purify the air. Provided on the mobile carrier a spray device, the spray means at one end and connected to the outlet pipe, the other end of the blower is provided, by transporting the wind turbine to the outlet so that the spray device spraying water column strength, to reduce airborne particulates and hazardous substance and safeguarding users' health.
<b>Class no.</b>	No. 1: Environment - Pollution Control

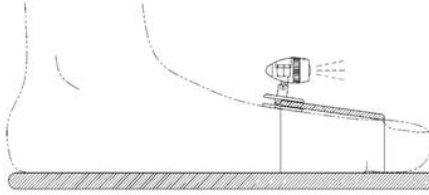


### TW.2.

<b>Title</b>	<b>NIGHT WITH AUXILIARY LIGHTING</b>
<b>Authors</b>	LIN FU LIN, JONG FUH CHENG, CHANG WEN CHUNG, HUANG SHAO EN, LIN CHIH YI.
<b>Institution</b>	Southern Taiwan University of Science and Technology
<b>Patent no.</b>	M561753

**Description EN** This creation when the user shoes on the act of touch sensors capable body so that a light, but when a light source.

Class no. No.6: Mechanical Engineering - Metallurgy



**TW.3.**

**Title** PLANT SAFETY MONITORING DISASTER PREVENTION STRAIN ROBOT

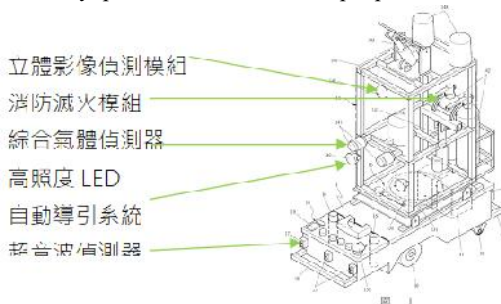
**Authors** Fa-Shian Chang, Xiu-Xan Song, Jyh-Haw Chen, Wei-Heng Chan, Jin-Wei Guo

**Institution** Cheng Shiu University and Li Chih Valuable School.

**Patent no.** M549727

**Description EN** The creation is a deterrent strainer that ensures the safety of the production environment. Combined with advanced information integration and status judgments of the cloud background, integrated indoor positioning, automatic guided fire, heat and humidity, integrated gas detector function, to assist staff to perform the usual factory inspection and accident and disaster control.

Class no. No. 12: Safety, protection and rescue of people



**TW.4.**

**Title**

**OUTDOOR SOLAR POWERED UMBRELLA**

**Authors**

KUO CHIN CHENG, JONG FUH CHENG, CHANG WEN CHUNG, HUANG SHAO EN, LIN CHIH YI.

**Institution**

Southern Taiwan University of Science and Technology

**Patent no.**

M561441

**Description EN**

The device is designed with both lighting and alarm system on any type of umbrellas with the use of solar energy supply. On the ferrule and the rib of the umbrella there is an energy-saving LED device which can be controlled on the crook handle. Also, the LED lighting on the ferrule can be the warning light in the night time, which can enhance the user's visibility and ensure passersby's safety.

**Class no.**

No.6: Mechanical Engineering - Metallurgy



**TW.5.**

**Title**

**SMART SPEAKER CLEANING DEVICE**

**Authors**

KUO CHIN CHENG, JONG FUH CHENG, CHANG WEN CHUNG, HUANG FEN LAN, LIN CHIH YI.

**Institution**

Southern Taiwan University of Science and Technology

**Patent no.**

M561665

**Description EN**

Development and production of environmentally friendly and meet the health specifications of the kitchen barrel as the theme, the use of cooling chip temperature control technology and ozone deodorant, UV lamp sterilization structure, and can combine the use of solar energy technology.

**Class no.**

No.6: Mechanical Engineering - Metallurgy



**TW.6.**

**Title**

**THE SWING INTO ELECTRICAL GREEN ENERGY**

**Authors**

KUO CHIN CHENG, LIN FU LIN, CHANG WEN CHUNG, HUANG SHAO EN, LIN CHIH YI.

**Institution**

Southern Taiwan University of Science and Technology

**Patent no.**

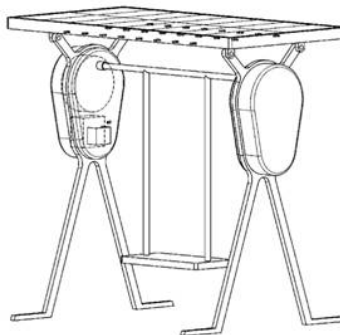
M566757

**Description EN**

The device body in the swing down, the lower center of gravity and increases its momentum source, so that the oscillating body can result in up to increase its potential to enhance the efficiency of the center of gravity .

**Class no.**

No. 6: Mechanical Engineering - Metallurgy



**TW.7.**

**Title**

**AI CHESS ROBOT**

**Authors**

Chen Chaoan, Chen Yunhua, Chiu YiKai, Chen Kuan-Hsueh, Yang QinYi

**Institution**

Taipei Municipal Nei-Hu Vocational High School

## EUROINVENT 2019

- Patent no.** 106204652  
Robot-vision player uses a robotic arm to play Othello game. First, chess board's information is captured by camera and analyzed by computer. According to the results, robotic arm is placing, taking or replacing chess.
- Description EN** People use this device will experience the real and novel feelings.
- Class no.** No.12: Safety, protection and rescue of people  
No.13: Sports, Games and Leisure



### TW.8.

- Title** AI PARKING SENSING SYSTEM
- Authors** LIN FU LIN, JONG FUH CHENG, CHANG WEN CHUNG, CHANG YUNG WEI, LIN CHIH YI.
- Institution** Southern Taiwan University of Science and Technology
- Patent** M561890
- Description EN** This invention is an electronic sensing device that detects whether the car in a reserved parking area is the owner of the parking space.
- Class no.** No.6: Mechanical Engineering - Metallurgy



**TW.9.**

**Title** AIR EXHAUSTING DEVICE

**Authors** HSU CHIH-YU, LU LUNG-HSING, LAI KUAN-YU, CHIU AI-YUAN, HSIAO YUN-HSUAN

**Institution** Taoyuan Municipal HsiHai Elementary School

**Patent** I542766

**Description EN** People always use air exhausting fan to cool down high indoor temperature. However, the fan is not quite effective and cannot be turned off.  
This invention is tested by the same size of wind tunnel (4 inches) and the same speed of wind; and it provides the average exhausting rate three times faster than the traditional fan does.  
This invention not only can provide air inflow and outflow with no air patterns but can also be turned off when no air exhaustion is needed. It's simple and easy to install, and the cost is also lower by its more efficient air exchanging rate.

**Class no.** No.7: Buildings and Materials



**TW.10.**

**Title** ANTI-BACTERIAL COPPER COATING AND ITS PREPARATION METHOD

**Authors** Tsung-Hsin Lin, Chiamei Lin, Chialing Lin

**Institution** Asia-Pacific Institute of Creativity/ Jia Hsin Creative Technology Co., Ltd.

**Patent no.** I 650436

**Description EN** The present invention describes Cu deposition of a



## EUROINVENT 2019

buffer possessing excellent thermal conductivity, and medical industry characteristics, containing Ru and Ag using a Cu and Ru/Ag target under a sputtering power of 20-200 W, for use as a buffer layer to reduce Cu oxidation.

Class no. No.14:other:electric product

### TW.11.

#### Title

**FLOW CAGE FOR EMERGENCY**

#### Authors

LIN YU-HAN, LIN HAN, KUAN CHIA-YI, KUAN CHUN-I, KUAN HSIEN-HSIANG

#### Institution

Yoder Bilingual Academy/Chung-Li Junior High School/Pingien Senior High School

#### Patent no.

M553214

#### Description EN

When the situation is critical and there are no passages and the rescuer has not arrived, this device can throw the rope to the rescued end, and then use the simple flow cage to transport the relief supplies (e.g food, drinking water, medicine, clothing...) to the trapped person to sustain life.

Class no. No.8: Aviation, car industry and transportation



### TW.12.

#### Title

**GO FISHING!**

#### Authors

CHANG YUNG-TING, CHAN YU AN, HUANG TZU Y, HSU CHIH-YU, KUAN HSIEN-HSIANG

#### Institution

Kornnell Academy

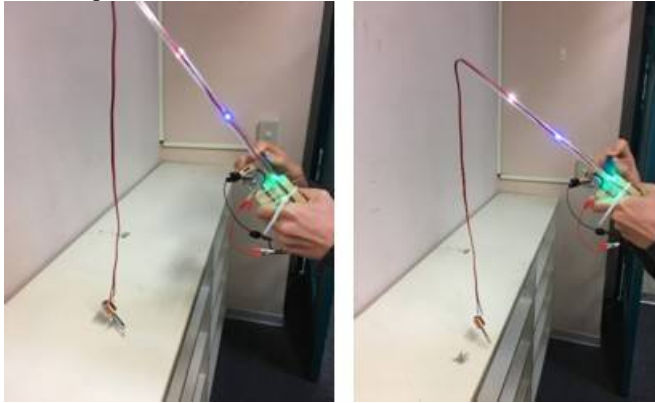
#### Patent

M574740

#### Description EN

This device is powered by hand, using electromagnetic induction and the magnetic effect, the fishing rod will stick on the fish. Meanwhile, it produces luminous effects, all in all, it is a very entertaining and educating toy.

Class no. No.13: Sports, Games and Leisure



**TW.13.**

**Title**

**HEAT TRANSFER PLATE OF CHISEL COOKING**

**Authors**

LIN YI-TE.

**Institution**

THOMSON ALUMINIUM INDUSTRY CO.LTD.

**Patent**

M561174

**Description EN**

After the heat conducting plate is placed on the top of the stove, it can accept all kind of material pot. Also it has a lot of function can used using different situation. Especially for this kind of situation. For example we all knew in the department store not allow to use fire. So it can used Induction cooker to explain and keep introduce to consumer. The most important is it also can be Baking tray or be a Thawing tray. We are quite certain this goods will be very worth to all the world on the market.

Class no.

No. 2: Energy and sustainable development



**TW.14.**

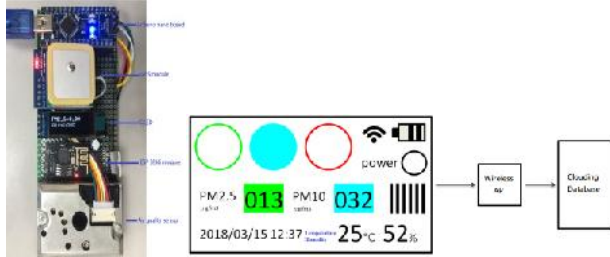
**Title** **LIQUID HEATING DEVICE**  
**Authors** KANG TSAI-HUA, WEI WEN-SHENG, CHIEN WEI, TSAI SHANG-TE, LEI XIAN-MIN  
**Institution** HungKuo Delin University of Technology, Ningde Qianwei Industrial Technology Co., Ltd. , Ningde Normal University  
**Patent no.** M525349  
**Description EN** This system provides a liquid heating device. It has good thermal conductivity, and can quickly transfer the heat of hot water to the liquid to be heated. The heating time is short and the heating efficiency is very high.  
**Class no.** No. 5: Industrial and laboratory equipments  
 NO.10:Information Technology and Communication



**TW.15.**

**Title** **MOBILE AIR QUALITY DETECTOR**  
**Authors** WEI-KUEI CHEN, TSENG-KUEI LI, PO-KAI CHEN, SHU-YEN HUANG, JIAN-TING SIE, SHENG-KAI HUANG, YAO-AN CHI, I-HUNG CHIEN  
**Institution** Chien Hsin University of Science and Technology/Lingnan Normal University/National Pingtung University of Science and Technology/Lioho High School.  
**Patent no.** M563628  
**Description EN** The creation allows users to monitor the air quality of their location at any time and provides a solution for people who live in a deteriorating air quality environment to maintain their own health. keeping improving, we know that flowering devices have been designed to light.

Class no. No. 10: Information Technology and Communication  
 No. 12: Safety, protection and rescue of people



**TW.16.**

**Title** MULTI-FUNCTION POT  
**Authors** LI, YU-LIEN.  
**Institution** Shawang Industrial Co.Ltd  
**Patent no.** M557076

**Description EN**

This pot has a lot of function. It can cook food, steamed food, Grilled food. Because of this pot has special design, it can separate vegetarian and meat. It is really useful if you friends are vegetarian and you are not.  
 Class no. No.14: electric product



**TW.17.**

**Title** SMART TYPE SHOW THE TEMPERATURE SHOWER DEVICE  
**Authors** LIN WEN CHIEH, CHUANG SHIH CHING, WU CHENG CHANG, LIANG PING SHUN, LIAW WEN FANG, LO TZU CHUN  
**Institution** KAO YUAN UNIVERSITY

**Patent no.** M575691

This project is talking about a kind of flowering device, especially the one which is able to display temperature.

**Description EN**

As we know, most flowering devices are usually connected with a water pipe. when water goes through the pipe and into the flowering device, we can adjust the type of spray, especially when used for taking a shower. With technology keeping improving, we know that flowering devices have been designed to light.

Class no.



**TW.18.**

**Title**

**SUN PROTECTION SKIRT PANTS**

**Authors**

Chun-Te Lee, Ching-Yun Hsu, Huan-Mei Chu, Ping-hsin Tai, Chia-Sheng Ma

**Institution**

Cheng Shiu University

**Patent no.**

M568614

**Description EN**

The original Sun protection skirt is inconvenient and dangerous for users who sit in the backseat of motorcycles. Our design could turn the skirt into pants by three Velcros or magnets in seconds.

Class no.

No.12: Safety, protection and rescue of people.



**TW.19.****Title****THE DEVICE OF MIXING CEMENT SLUTTY****Authors**

Cheng Chin-Hsiang

**Institution**

Young An Mineral Tech Co., Ltd

**Patent no.**

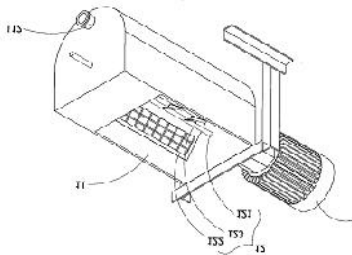
M560473

A cement stirring device, a bubble feeding device and a driving device are arranged in a stirring tank for vertical stirring action, and uniformly agitating a foam body and a cement slurry in the stirring tank to form a foam by stirring. The cement slurry and the foam supply device have a first valve body and a second valve body.

The first valve body can deliver a high-pressure gas to a storage container of the bubble supply device, and the second valve body can be used to store the storage material. The bubble body is transported, and the second valve system is provided with a control switch for timely and quantitatively conveying the bubble body to the storage container. It can achieve the purpose of providing a foaming cement slurry mixing system which stirs the foamed cement slurry raw material by vertical stirring, and can supply the foamed cement raw material regularly and quantitatively.

**Description EN****Class no.**

No. 7: Buildings and Materials

**TW.20.****Title****THE DRIVE BIRD FEEDER GREEN ENERGY****Authors**

KUO CHIN CHENG, LIN FU LIN, CHANG WEN CHUNG, CHANG TING YU, LIN CHIH YI.

**Institution**

Southern Taiwan University of Science and Technology

**Patent no.**

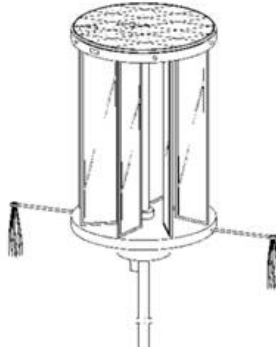
M561409

**Description EN**

The device body in the swing down, the lower center of gravity and increases its momentum source, so that the oscillating body can result in up to increase its potential

**EUROINVENT 2019**

Class no. to enhance the efficiency of the center of gravity .  
No. 6: Mechanical Engineering - Metallurgy



**TW.21.**

**Title** **THE STRUCTURE OF THE RAINCOAT (RAIN PANTS) WITH WATER DIVERSION**

**Authors** Chun-Te Lee, Yu-Ting Lin, Huan-Mei Chu, Ping-hsin Tai, Chia-Sheng Ma.

**Institution** Cheng Shiu University

**Patent no.** M568616

**Description EN** We design a water diversion in the bottom of raincoat.

The length of both sides of raincoat is longer than middle part so that rainwater will be diverted to both sides without wetting our pants and shoes.

Class no. No.13: Sports, Games and Leisure



**TW.22.**

**Title** **AUTOMATIC ORDERING AND SERVING SYSTEM**

**Authors** KANG TSAI-HUA, XU JIN-JIE, CHIEN WEI, TSAI

INTERNATIONAL EXHIBITS

EUROINVENT 2019

SHANG-TE, LEE CHIA-WEN

**Institution**

Yulin Normal University, HungKuo Delin University of Technology, Yango University, Ningde Qianwei Industrial Technology Co., Ltd.

**Patent no.**

M525897

**Description EN**

The invention provides an automatic ordering and matching system. It can be used for shop assistants to quickly type the dishes into the dishes and drive them out to avoid changing dishes in the middle of the way. No. 2: Energy and sustainable development

Class no.



**TW.23.**

**Title**

**VOICE CONTROL SYSTEM BASED ON ZIGBEE**

**Authors**

Wen-Tsai Sung, Chung-Yen Hsiao, Chun-Wei Sung

**Institution**

National Chin-Yi University of Technology

**Patent no.**

107111826

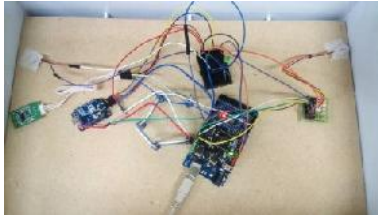
**Description EN**

In order to improve the patient's inconvenience, we designed a voice-activated voice control system with high-performance voice chips and low-energy ZigBee chip modules to solve the inconvenience of patients. The patient communicates the need in a vocal manner, operates the device to be controlled by the patient, and communicates it to the control center, so that the hospital understands the condition of the ward and provides a convenient and comfortable environment for the patient. The basic devices that can be operated in this topic are curtain lights and fans. We wirelessly transmit the status of the ward to the PC via ZigBee, or we can control the ward device from the PC via ZigBee wireless transmission, so that the nursing staff can grasp the condition of the ward and control the ward device.

Class no.

10





**TW.24.**

**Title**

**TWO-WAY HEADPHONE LINE RECEIVING DEVICE**

**Authors**

KANG TSAI-HUA, CHIU CHIEN-CHING, WEI WEN-SHENG, GONG FAN-YUAN, CHEN KANG-WEI

**Institution**

HungKuo Delin University of Technology, TamKang University, Ningde Qianwei Industrial Technology Co., Ltd. , Ningde Normal University

**Patent no.**

M525595

**Description EN**

The invention provides a two-way headphone line receiving device. To overcome the drawbacks of the existing technology, it can shrink at both ends, and is convenient, fast, compact and easy to carry.

**Class no.**

No. 10: Information Technology and Communication



## Thailand

By ATIP

### TH.1.

#### Title

**DERMOFIX®** : Very high proline complex collagen for anti-aging effect on skin properties

#### Authors

Pornsayapat Likhithummagun, M.D.

#### Institution

**DERMOFIX (THAILAND) CO.,LTD**

#### Patent no.

Patent application No. 1803001310/2018

#### Description EN

**DERMOFIX®** is a novel formulae of very high proline complex collagen (VHPCC) from fish scale. Certain innovative processes via enzymatic hydrolysis and specific filtration are executed to obtain higher amount of free-form glycine, proline and hydroxyproline than normal. Such amino acids, called “proline complex”, are specific for collagen synthesis in human body. Through deodorization and decolorize follow with filtration and powdering, high content of “*proline complex*” collagen powder is obtained. Mechanism of action in human body of VHPCC is by acting as transcriptional factor on fibroblast and as substrate for translation process in collagen synthesis pathway. The proliferation and motility of fibroblasts will induce an increase in collagen fibres’ density and diameter in the dermis. VHPCC is also be able to increase hyaluronic acid production and activate protection against UVB radiation.

From clinical study, VHPCC showed statistically significant improvement and gain faster effects than the commercially available collagen and placebo, in skin elasticity, hydration, melanin index, trans epidermal water loss, smoothness and wrinkles. Most effects by VHPCC showed statistically significant improvement since the first week while commercially available collagen showed some improvement at fourth or eighth week. VHPCC also showed impressive improvement on knee joint problems such as knee joint pain, joint sound on movement and increase joint flexibility. Moreover, VHPCC showed benefits on other collagen-containing organs. Applications: Mix with 200 ml water and consume everyday on empty stomach before bedtime, morning time or between major meals.

#### Class no.

4 Medicine - Health Care – Cosmetics



DERMOFIX® : 2 different flavors are available, original flavor (green) and mixed berry flavor (pink) (<https://www.facebook.com/dermofixthailand/>)

## TH.2.

### Title

**Absolute Rose Emulsion** : Enriched anti-wrinkle and brightening serum using *Mohammadi damascena* flower and star gooseberry

### Authors

Anantra Sukontasing, Assoc.Prof. Pabhop Sinchayakul, Assoc.Prof. Weerathep Pongprasert, Asst. Prof. Orn-In Prachaiyo and Asst.Prof. Puntarika Ratanatriwong

### Institution

CHLOE ROSE CO., LTD/ Kasetsart University Kamphaeng Saen Campus/ Naresuan University

### Patent no.

Patent application No.1903000440/2019 (TH)

### Description EN

“*Absolute Rose Emulsion*” is an innovative emulsion-blend serum containing active ingredients naturally extracted from damask rose (*Mohammadi damascena*) and star gooseberry (*Phyllanthus acidus* (L.) Skeels). The rose flower water (RFW), rose oil (RO) and *P. acidus* leaf extract (PAL) were extracted using steam distillation and ethanol, respectively. High phenolic contents and flavonoids were found in *P. acidus* leaf extract whereas rose polyphenols and eugenin were dominant in rose. These phytochemical compounds showed high tyrosinase activity inhibition as  $42.92 \pm 3.85\%$ ,  $26.45 \pm 0.47\%$  and  $11.81 \pm 0.87\%$  as compared to Kojic acid for RFW, RO and PAL extract, respectively. Rose polyphenol also inhibits hyaluronidase that destroys hyaluronic acid in inner skin. These novel whitening phytochemical compounds were formulated with mineral water, hyaluronic acid, vitamin E, emulsifier and stabilizing agents to create a clear and strong gel-structure serum with penetrating power of serum water and comforting of oil. The mixture was gently mixed together before using rapid emulsifying technique, resulting in a serum with soft and light texture which was rapidly absorbed without any oily residues after applied on skin.

Satisfaction results of serum usage was found higher than 85% with volunteer customers. The noticeable skin benefits included skin brightening, facial-oil balancing, replenishing

moisture and firming complexion, refining skin texture by tightening dilated pores, diminishing fine lines and wrinkles, and reducing acne. Thus, “Absolute Rose Emulsion” is a novel whitening, moisturizing, facial oil control, refining pores, anti-wrinkle and anti-acne serum from natural phytochemical compounds with high market potential, and these novel compounds could also be formulated for more product line extensions.

4. Medicine - Health Care - Cosmetics

**Class no.**



**TH.3.**

**Title**

**Re-Grow Coral**

**Authors**

Nichanant Sermsri, Noppadon Sangwalpetch, Akapong Inkuer, Khanin Phriwanrat, Sichol Rodtayoi

**Institution**

Suan Sunandha Rajabhat University

**Patent no.**

Patent application No. 1903000112

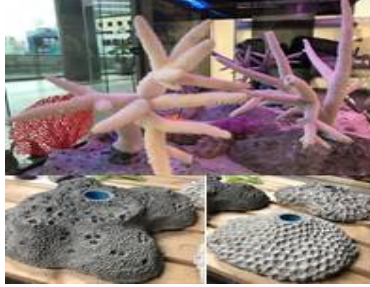
**Description EN**

Re-Grow Coral is an environmental friendly new product designed for coral restoration to increase the number of coral reefs. With different of product designed to look like natural coral, it is in harmony with sea nature in order to increase the choice of usages. It is almost entirely made from natural materials such as the shells left from agriculture and consumption, which have lots of calcium carbonate and fits well with the structure of the coral. With coconut fibers, sand and cement natural materials will be mixed together to adhere all ingredients.

Re-Grow coral will be used by bringing corals that grown strong enough from coral nursery units to attach to the structure of restoration base, and then installed at the restoration site. It has pH of 8, which is close to the pH of seawater. The field test by using Re Grow Coral for planting branches of 300 Staghorn coral at Samaesarn beach area in Sattahip district, Chonburi province indicated that the survival rate of Staghorn coral was 98 percent. Not only use as a base for coral restoration, but also use to promote tourism areas for tourism business sector by creating a new coral reef sightseeing route from the coral restoration base to accommodate tourists without affecting the existing natural coral reefs.

1. Environment - Pollution Control

Class no.



**TH.4.**

**Title**

**Push and Dry®**

**Authors**

Noppadon Sangwalpetch, Akapong Inkuer, Nichanant Serm Sri, Khanin Phriwanrat, Varit Aunsombut

**Institution**

Suan Sunandha Rajabhat University

**Patent no.**

Patent application No.

1902000278,1902000279,1902000280, 1902000281

**Description EN**

Fresh stucco sculpture is a Thai national art that needs to be preserved because this kind of art work is going to disappear. The main reason is the Fresh stucco sculpture need to use a specific skills and expertise to mold the work piece in order to come out well. Therefore, it caused the lacking of interested persons who can inherit wisdom of Fresh stucco sculpture. In addition, the application of the art of Fresh stucco sculpture is still in a narrow area, such as for temple decoration only. Therefore, Push and Dry is designed to help inherit the wisdom of art of Fresh stucco sculpture in Thailand by considering the working procedure and production process that are easy, convenient, fast, meet standard of production and can apply to variety of applications, but still maintain the quality and strength as before.

**Push and Dry®**, a stucco creative equipment is designed for arts and crafts. With **Push and Dry®**, a unique wisdom of Thailand fresh stucco sculpture art can be created easier by using different design of stucco dispenser pump patterns. The art piece can be created in a standard form in 2 steps, only by pressing clay to form a unique shape and bringing to dry out. In addition, **Push and Dry®** can also be used as a teaching and learning media for creating fresh stucco as well as for creating artworks. Furthermore it can be considered as a tool for conservation and development of national handicrafts

Class no.

14. Other

**TH.5.****Title****Alga-Boom****Authors**

Khanin Phriwanrat, Noppadon Sangwalpetch, Akapong Inkuer, Nichanant Sermsri, Mongkol Ingkutanon

**Institution****Suan Sunandha Rajapath University****Patent no.**

Patent application No. 1903000110

**Description EN**

Seaweed in shrimp farms such as *Gracilaria fisheri*, *Cladophora glomerata*, are serious local natural weed that can be found in many countries in Asia, included green algae group which is the largest group found in freshwater, saltwater and brackish water. They have high fiber and cellulose on the cell wall. The problem of rapid increasing number of algae affects shrimp farming career because the amount of algae can affect the quality of water. If it is left for a long time, algae will die and sink to the bottom of the pond causing excessive ammonia in the water and polluted water subsequently. Furthermore, it will become a lot of waste and smelly spoilage that disturbs neighborhood.

Therefore, **Alga-Boom** is designed to recycle algae in shrimp farms and develop as paper which is environmentally friendly. The paper produced from algae is dyed from natural materials, such as yellow from curcuma and blue from indigo. The designed seaweed paper passed various standard tests as follows; the standard weight value is 242 grams per square metre, tensile strength value is 0.53 kN per meter and tearing resistance value is 1183 mN.

14. Other

Class no.



**TH.6.**

**Title**

**Nature Mate ®**

**Authors**

Akapong Inkuer, Nichanant Serm Sri, Noppadon Sangwalpetch, Khanin Phriwanrat, Wiriya Ketchu

**Institution**

Suan Sunandha Rajabhat University

**Patent no.**

Patent application No. 1903000111

**Description EN**

“*Nature Mate* ®” is a design, fashionable, and natural made rubber sheet handbags. It is made of local natural rubber sheet with creativity and eco-friendly mindset. Product design and production process are deliberately planned to implement within local communities which is abundant in rubber trees. Artistic design, eco-friendly production process, and simple technology are taken into account that local people can exploit local raw material to produce added-value products and raise their income in communities.

Nature Mate ® has 3 different ways to create the surface of the workpiece which is used as the main material in producing handbag as follows; 1. Create the surface by painting the desired pattern with latex mixed with acrylic colors. 2. Create the surface by dripping rubber on vinegar to create a rough surface. 3. creates surface by pouring latex on objects to create patterns on the rubber surface as per the pattern of prototype object. As friends to nature, any chemical adhesive substance e.g. glue to assemble pieces of rubber sheet is replaced to rubber latex. The combination of rubber latex with certain substances is a critical ratio. Only suitable ratio is develop.

The designed rubber sheet handbags passed various standard tests as follows; the tensile strength value is 1.1 N per square millimetre, tear strength value is 3.3 N per square millimetre, and elongation at break value is 936 percent.

**Class no.**

14. Other



**TH.7.**

**Title**

**Seanpee balm gel**

**Authors**

Duangporn Nacapunchai, Narin Kakatum, Issree Jittsomnuk, Supalak Fakkham and Thavatchai

INTERNATIONAL EXHIBITS

	Kamoltham
<b>Institution</b>	Suan Sunandha Rajabhat University
<b>Patent no.</b>	Patent application No. 1903000593
	Seanpee gelly is transparent balm gel and penetrates rapidly and completely into the affected tissues. The active ingredient is methanolic extract of <i>Cleome viscosa</i> , a neglected crop, which grows as a weed along roadsides, wastelands and degraded areas in warmer parts of the world. This plant products present a broad spectrum biological functions of anti-inflammatory, antioxidant, antimicrobial and hepatoprotective activities. That makes <i>Cleome</i> extract possesses significant wound healing and pain-relieving powers with helps at minor wounds, burns, contusion, frostbite, and joint pain. Furthermore, as in Seanpee gelly, a combination with glycerin provides the optimal hydration to moisturize and successfully heals skin dryness from cracks and eczema.
<b>Description EN</b>	Topical application of Seanpee gelly was studied in 30 volunteers with skin abrasions (5), mosquito bite (8), acne (4), cracks (2), acute wound (3), non-severe burns (3), contact dermatitis (2) and eczema (3). The wounds were treated twice daily and observed for 1, 3, 7, or 14 days and the changes of wound areas, erythema and pigmentation were measured. The results showed the significant wound healing activity as evidenced by the reduction in the number of days required, falling of the eschar and the wound contraction compared to the control groups. That makes it a great natural remedy for breakouts an excellent for the skin care product.
<b>Class no.</b>	4. Medicine - Health Care - Cosmetics



<b>TH.8.</b>	
<b>Title</b>	<b>Three mushroom serum</b>
<b>Authors</b>	Narin Kakatum, Jatupat Anuchon, Yupatinee Jitsupho
<b>Institution</b>	<b>Suan Sunandha Rajabhat University</b>
<b>Patent no.</b>	Patent application No. 1903000594
<b>Description EN</b>	Three mushroom serum (TMS), is made from Abalone Mushroom ( <i>Pleurotus ostreatus</i> ), Bhutan mushrooms ( <i>Pleurotus eous</i> ), Shiitake Mushroom ( <i>Lentinus edodes</i> ) from



## EUROINVENT 2019

organic farm. Three mushrooms known as wild for healthy drink and medicinal herb especially on wound healing, antioxidant, and anti-inflammatory property. In research studies have screened volunteers 30 people and import all the project 20 people were 2 groups, those who received TMS extract 30 cc., 10 people and groups who received a serum standard 30 cc., 10 people., The studies on the skin of face in volunteer (n=20) observe on day 0, 14 and day 28. The statistical analysis comparing the pair with the day 0 were found to be significant difference statistically, ( $p > 0.05$ ). TMS extract compare serum standard are tend to decrease in both groups. The statistical analysis of effectiveness in reducing spots, wrinkles, texture, dark circles of skin face in both group's day 0, 14 and day 28 did not difference what mean and significantly ( $P < 0.05$ ) that is both TMS extract and serum standard can decrease spot, wrinkle texture, dark circles of skin face activity. Apply 2-3 drops on clean toned skin and then gently stroke with fingertips for faster absorption. Protecting and nourishing the face with three mushrooms

**Class no.**

4. Medicine - Health Care – Cosmetics



### TH.9.

**Title**

**Feasibility of Technology Commercialization Analysis and Technology Valuation Software**

**Authors**

Jarika Makkoch, Samattapon Witthawaskul, Chawalit Dan Thanabordee Tongkum, Sutus Jatchartee

**Institution**

Imagine Innovation Co., Ltd.

**Patent no.**

374309 (copyright registration filing No.)

**Description EN**

An enhancement of technological and innovative capability is required to pave the way for an increase of economic competitiveness of industry for developing new, state-of-the-art products. Many academic-industry alliances have been founded but there are still obstacles in technology transfer process from universities to private enterprises. One of the biggest difficulties is to evaluate whether it can be commercialised in terms of readiness and compatibility. Other practical difficulty is the negotiation of licencing options and fees. Our software is designed to perform a “desk assessment”

## EUROINVENT 2019

in technology appraisals and calculate the price range of technology licensing fees to facilitate the technology transfer from universities or research institutes to enterprises.

Our software assesses the feasibility of a potential technology using 4 analysis instruments i.e. technology, intellectual property, market and finance, developed from a qualitative study of commercialization development and in-depth interviews. These four areas of analysis are comprised of 47 variables which were collected from structured questionnaires from researchers in universities, entrepreneurs and R&D personnel from innovative firms. Then data were analysed by descriptive statistic and SEM (structural equation modeling) before the weight factors for the instrument criteria (such as technology readiness, remaining time of IP, PBIT, discount rate, etc.) were calculated.

The results from the analysis showed that the standardized solutions for all indicators were ranked from 0.46 to 0.82. This new software can significantly reduce the time of technology appraisals from 21 days to 48 hours, and eliminate the bias of experts through the use of global big data.

**Class no.**

14. Other

**TH.10.****Title**

**Innovation for Prevention and Elimination of Germs to Hygiene in Modern Deer Farm**

**Authors**

**Siseerot Ketkaew, Pornchai Wongwasana, Manee Archawaranon**

**Institution**

**Ramkhamhaeng University**

**Description EN**

This invention presented the innovation for prevention and elimination of germs to hygiene in modern deer farm using pulse corona electric field net on principle of plasma and electric field intensity changing technique. (Name integration plan is Innovations for Modern Agriculture). The power supply based on mini converter comprises of a pulse generator using NO. IC#SG3524 for the electric field intensity adjustment at 5 kV/cm, 10 kV/cm, and 15 kV/cm under switching frequency adjustment at 15 kHz, 25 kHz and 35 kHz, respectively, and high frequency pulse transformer was used as a ground isolator and signal expanding for Power MOSFET#IRF710 driving to control high voltage switching transformer to generate 1 kV, 2 kV and 3 kV by using cell electrode (high voltage wire) for generate ozone gas. The experimental results are switching frequency increasing of high voltage at 1 kV equal to 15 kHz, 2 kV equal to 25 kHz, and 3 kV equal to 35 kHz which the testing of ozone gas quantity measuring will observation at electric field intensity equal 5 kV/cm enables generate ozone gas 3.87 ppm, 10 kV/cm enables generate ozone gas 5.43 ppm and 15 kV/cm enables generate ozone gas 6.59 ppm. By ozone gas 6.59 ppm can be used to get rid of germs, as well. Innovation for prevention and elimination of germs has been tested by the international standards of Electromagnetic Compatibility, EMC [CISPR 14-1( Click), IEC 61000-3-2 (HE), IEC 61000-3-3 (VF), CISPR 14-2 (CI, Surge, Vdip, PFM) is completed. Testing at the test room of electrical and electronic products testing center (PTEC), Thailand. Therefore this research was funded activities to promote and support research of the the Government 2019. and can be developed into commercial innovations in the future.

**Class no.**

2



## Turkey

Represented by  
*Dr. Ayhan DADASH*

### TR.1.

**Title**

PeroSolar

**Authors**

Abdullah Kurtoglu

**Institution**

PeroSolar [www.perosolar.com](http://www.perosolar.com)

**Patent**

Pending

PeroSolar was established in 2018, as a spin-out from intensive research and development on thin film solar technology. The company exclusively focused on developing and commercialising revolutionary, light-weight and low-cost perovskite solar cells in a form of thin, flexible foil. Perovskites are a class of semiconducting materials that predicted to play a role in next-gen solar cells, electric vehicle batteries, sensors, lasers and much more. PeroSolar thin solar cell foils aim to increase the efficiency and lower the cost of solar energy.

**Description EN**

Our project is about to develop thin perovskite solar cell foil cover for charging batteries of mobile phones, tablets and laptops. Sustainable and clean energy is produced from sun and indoor lights to charge wireless-wireless into devices by covering their surface with the solar cell foil of PeroSolar. This technology helps to extend significantly device batteries service life during a day. We currently have prototypes of solar cell foil and carry on research to improve their efficiency and life time in PeroSolar laboratory. Solar cell foil covers are being planned to start selling in solar market by the end of 2019. PeroSolar develops sustainable and green energy technology products for our life

Class no.

2



**TR.2.****Title****(Chape), Headwear Production Method****Authors****Selva Sadikoğlu Sayhan****Institution**

Selvano Chape Tekstil LTD. ŞTI.

**Patent**

Turkish patent

**Description EN**

This invention is about women's belief, disease (cancer disease, old age, dermatological disorders) health (infection and hygiene problems in the period of treatment) uniforms and clothes in traditions and the way the wear

it can close whole the head without aesthetic and fashion transmissions. This invention designed by and special technique prepared by special pattern and castings, we use and special way to completely close the whole head and stop sweating it. It will designed personally also is under producing.

All women's that wear hat, scarf, bonnet and head accessories can use this product.

Future prospects could be women's from all over the world that have this issue and searching for the solution.

Class no.



## Ukraine

**UA.1.**

<b>Title</b>	<b>Hemocontrol: Haemostatics With Junction Coupling</b>
<b>Authors</b>	V. Kurylenko
<b>Institution</b>	<b>National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" Ukraine</b>
<b>Patent no.</b>	Pending
<b>Description EN</b>	<p>The injection "HemoControl" allows to stop the bleeding of different intensity (including arterial) within the shortest time. The mineral that is a base of the product forms a blood clot quicker. The developed injection can not only stop the bleeding, but it will securely clog the wound for safely transportation of the victim. The injection can be used to stop the bleeding and disinfect deep penetrating wounds, including gunshot. With the help of "HemoControl" it becomes possible to anesthetize and stop bleeding quickly, to avoid infection and wound contamination, which will increase the survival of the victim. The patch can be used on open skin and muscle wounds. The components of the "HemoControl" are widely available and inexpensive. In that case the prime cost of the product will be significantly below the price of analogue.</p>

Class no.

4

# United States of America

By *TISIAS*

**US.1.**

**Title**  
**Authors**  
**Institution**  
**Patent no.**

**Multi-Dispenser Refrigerator**  
 TERESA HARRIS  
**Stillwater Dispensers**  
 US 7712328 May 11, 2010

**Description EN**

A refrigerator having ice and water dispensers on both the front, back and side improves efficiency and utilization of the refrigerator. Home floor plans show openings in interior walls to access the second and third dispensers. Great for large families or group homes by reducing the traffic jams at the refrigerator and increases accessibility while maintaining energy efficiency. The refrigerator is ergonomically designed with practicality and efficiency in mind, this new fridge is built with between 2 to 4 water and ice dispensers. With this innovative design, you are virtually able to access water and ice from anywhere in your home. It is the perfect solution for families, couples, college dormitory lounges, restaurant kitchens, offices, and parties that enjoy having a company. There will be no more waiting in line for water – between 2 to 4 people can access water/ice at all times without interfering with the refrigerator. The design fits any apartment and house layout. With this refrigerator, everyone becomes happy as there will be no more congestion and discomfort upon their ways to getting water and ice.

Class no.

7

Perfect for offices and parties.  
 Fits any apartment/house layout.

2-4 ice and water dispensers  
 More than one person has access to the fridge at the same time.

For more information contact **214-938-5618**  
 terehar@gmail.com Teresa Harris

## United Kingdom

*By Association of British Inventors and Innovators*

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**UK.1.**

**Title** Eureka Miracles Crystal White Formulation

**Authors** -

**Institution** Eureka Miracles Laboratories Inc.

**Patent no.** -

**Description**

**EN**

This is a special Collagen formulation that uses Liposomal delivery method that can be easily assimilated or absorbed by the body after consumption. The only collagen formulation that combines glutathione, for skin radiance, and skin elasticity.

**Class no.** 4: Medicine: Healthcare - Cosmetics



## Vietnam

*By Dr. Phan Quoc Nguyen, Vietnam National University, Hanoi*

### VN.1.

**Title**

**Multichannel Smartphone Optical sensor For Environmental applications**

**Authors**

Vu Dinh Loc, Vu Hung Trung

**Institution**

DAO DUY TU HIGH SCHOOL, HANOI

**Description EN**

In the recent years there has been an increasing interest on optical sensors using smartphone due to its reliability, easy-to-use, and low cost. However, most of smartphone optical sensors are single channel, that means they can measure only one sample at a time. In this work, a multichannel smartphone optical sensor is demonstrated that has six channels for both transmission and fluorescent measurements. It was constructed by implementing several external light sources, collimation lens, a diffraction grating, and a CMOS chip of a smartphone as a detector. The construction allows the device to measure six samples at a time while still maintaining its optical bandwidth of 300 nm (from 400 to 700 nm) and its resolution of 0.26 nm/pixel. As a proof of concept, the multichannel optical sensor using a smartphone is applied to monitor the concentrations of some reactive dyes in industrial wastewater such as methyl blue (MB), methyl orange (MO), Rhodamin B (RhB). Despite of its cost-effectiveness, the spectrometer exhibits reliable results, which can be considerably comparable with that of laboratory instrument.

### VN.2.

**Title**

**Sunflower capable of following the light and remote control**

**Authors**

Nguyen Huu Loc, Ha Thien Kim

**Institution**

Nguyen Tat Thanh High School, Dao Duy Tu High School, Hanoi

**Description EN**

This invention is a filed patent. This innovation presents a sunflower, which can measure air humidity, air quality

as well as temperature of the environment. The sun flower can be controlled from far away using IoT (Internet of Things) technology with a mobile app via the Internet. In addition, it can charge the mobile phone using solar energy. Most importantly, the sun flower uses an innovative method to increase the efficiency of photovoltaic system, it can follow the movement of the sun throughout the day.

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**VN.3.**
**Title**

**Purification of alpha-glucosidase inhibitor making products for the treatment of type II diabetes**

**Authors**

Nguyen Dang Nhat Minh, Nguyen Duc Thinh

**Institution**

Dao Duy Tu High School, Hanoi

**Description EN**

This study was to purify an alpha-glucosidase inhibitor from culture broth of *Bacillus subtilis* EBL1 and to identify its chemical structure. Membrane dialysis, active charcoal, gel filtration chromatography, and thin layer chromatography (TLC) were used in the purification, while positive nuclear magnetic resonance (NMR) spectrometry were used in the identification. The NMR data showed that the purified alpha-glucosidase inhibitor was 1-deoxynojirimycin (DNJ). The purified DNJ was used to evaluate the hypoglycemia in streptozotocin (STZ)-induced diabetic mice model. The DNJ was reduced the blood glucose levels compared to the acarbose positive control group in STZ-induced diabetic mice. The DNJ compounds might be used to make products for the treatment of type II diabetes.

# Yemen

*By The Union Of Arabian Academics*

**YE.1.**

**Title**  
**Authors**  
**Institution**  
**Patent**

**Manual Charger Stick**  
Mohammed Moaeed  
**The Union Of Arabian Academics**  
Patent application No. on 8 February 2019.

The electric stick is defined as a stick, electric circuits, staplers, and dynamos, which are used by manual pressing or pressing during walking and are automatically charged. The electric energy is then stored through the hoax of the charge and discharged through a switch controlled by light and need. It can be used for phone charging, bulb lighting and radio operation. And a number of purposes.

Uses:

- Charge cell phones batteries and other small batteries by pressing through hand or by walking
- Illuminate lamps
- Power radios

Components:

- Circuits
- Denamos
- Pistons
- Electricity conductors
- Charger
- Power bank
- A handle used to hold a lamp and generate electricity

Characteristics:

- Environment friendly
- Safe
- Easy to use
- Economical
- Can be used everywhere
- Can be used when the electricity goes off unexpectedly
- It generates electricity manually
- It can be further developed to charge more and more batteries fast

**Description EN**



Class no.

10

**YE.2.**

**Title**  
**Authors**  
**Institution**  
**Patent**

**Sniper laser Training Security**  
 Mohammed Moaeed  
**The Union Of Arabian Academics**  
 Patent application No. on 8 February 2019.  
 It consists of two electrical devices, one transmitter consisting of a laser pistol and the other a receiver, which is a laser beam pickup, thus affecting the impact and injury of the target. It is used by laser on multiple distances.  
 They are electrical devices and circuits that generate the energy of a transmitter  
 A receiver consists of electrical circuits and a receiver for laser beams.  
 When the laser beam is sent from several distances, it vibrates in the receiver and moves.

**Description EN**

New Features:  
 1 - Has the ability to work day and night alike  
 3 - Ease of use and does not cost financial or economic efforts  
 4 - easy to use and mobility of electric voltages ranging from 3 volts to 4 and 5 to 6  
 5 - Advantages of safety during training..  
 Uses :-  
 1 - Shooting training and precise targeting  
 2. It can be used in a number of economic purposes.  
 3 - Used during training for students colleges and college

Class no.

2



**YE.3.****Title****Hydro Air Power****Authors**

MOHAMMED MOGRAM

**Institution****The Union Of Arabian Academics****Patent**

10-102018

Innovation generates electricity from constantly recirculating water to the tank. Where the invention is proven practically tested, which works by hydropower . It provides sustainable , clean energy and is available to all and economic and profitable and solve the top three problems and is the geography and high cost in the construction of power plants.

Where it works by the Turbine and needs to force the pressure of air and water and generates energy up to 0.002-0.005 / KWH.

Innovation has been successfully tested on a primitive and ready-to-use model.

**Description EN**

Steps of work and training and idea:

The idea is inspired by this method (water tank - turbine - compressed air = energy) where the energy is generated by the water and then the same water is returned to the tank. The invention was tested and electric power was generated efficiently and economically and the water was returned to the reservoir at a height of 12 meters successfully and continuously. This test is designed to test the recycling system and its effectiveness and compatibility with the power generation process. Where the test was repeated ten times and the result was positive and successful.

**Class no.**

2



# NATIONAL EXHIBITORS

Universities

Research Institutes

Companies

Individuals

## University POLITEHNICA of Bucharest

### RO.1.

<b>Title EN</b>	<b>AUTOSTATIC SPECULUM WITH ASPIRATION SYSTEM AND VARIABLE OPENING</b>
<b>Authors</b>	DOICIN Cristian - Vasile, ULMEANU Mihaela - Elena, SEMENESCU Augustin, DAVIȚOIU Dragoș - Virgil, COSTOIU Mihnea - Cosmin, DOICIN Ioana - Cristina, MANDA Ana Laura
<b>Institution</b>	<b>University POLITEHNICA of Bucharest</b>
<b>Patent no.</b>	<b>RO132845</b>
<b>Description EN</b>	The invention relates to an autostatic anal speculum medical device with a variable opening able to be fixed to the metal structure of the operating table and to independently maintain the position during the entire surgical procedure, to assure the appropriate illumination of the operator field, the suction of the fluids and tissue debris from the field of the operator field, facilitating access to the anal and lower rectal channels - designed for clinical examination, therapeutic procedures and surgery at the level of the rectal - providing an optimal operator field thanks to the adjustable opening of the arms retractors.
<b>Class no.</b>	4

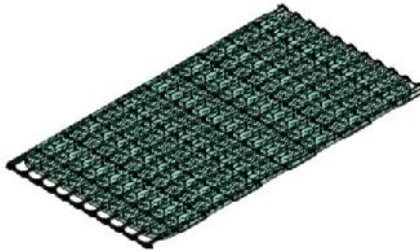


### RO.2.

<b>Title EN</b>	<b>BIOCOMPOSITE MEDICAL DEVICE FOR THE EXTENSIVE RECONSTRUCTION OF SOFT TISSUE AND ITS METHOD OF MANUFACTURING</b>
<b>Authors</b>	Ulmeanu Mihaela-Elena, Doicin Cristian-Vasile, Davițoiu Dragoș, Tunsoiu Daniela, Tunsoiu Nicolae, Murzac Roman, Paraschiv Alexandru, Doicin Irina-Elena, Semenescu Augustin, Costoiu Mihnea, MATEȘ Ileana Mariana
<b>Institution</b>	<b>University POLITEHNICA of Bucharest</b>
<b>Patent no.</b>	Patent application RO 00821/2018



- Description**  
EN The invention relates to a biocomposite medical device that facilitates the surgical repair and reconstruction of an otherwise irreparable inguinal hernia and by a technique that alleviates the problem with a very low risk of recurrence. The biocomposite medical device consists of the reinforcement layer of silk fibre fabric and the composite material sheet composed of a mixture of silicone and silk and polyester ground fibres. The biocomposite medical device also features modular gripping elements throughout the perimeter.
- Class no.** 4

**RO.3.**

**Title EN** **MECHANO-ELECTRIC LAUNDRY DRYER**

**Authors** Florin MICULESCU, Marian MICULESCU, Mihnea Cosmin COSTOIU, Oana-Roxana CHIVU, Cătălin-Alexandru BARBU, Augustin SEMENESCU

**Institution** University POLITEHNICA of Bucharest, RO, EU

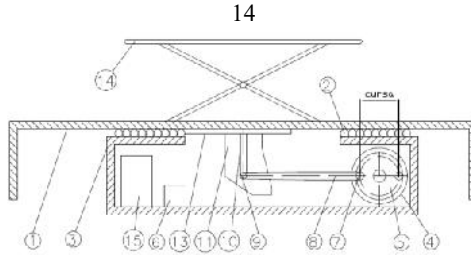
**Patent no.** **RO131500**

- Description**  
EN The invention relates to a dryer for laundry, towels and bed linen, which can be used in households, hotels or other public lodging establishments. According to the invention, the dryer comprises a translation table (1) in the shape of a hollow parallelepipedal box made up of fireproof plastics, perforated on its whole surface for ensuring ventilation and avoiding overheating, provided with a rectangular opening, on whose edges there are some metal slides (2) placed longitudinally, by means of which it rests on a protective box (3) inside which the drive mechanism is located, the drive mechanism consisting of a variable speed gearmotor (4) connected to a transformer (6), at the output of the gearmotor (4) there being a gin (5) continued with a mobile joint (7) on which a connecting rod (8) is fixed with a mobile joint (9), attached to a horizontal reinforcing gusset (11), welded to

NATIONAL

the vertical reinforcing gussets (10) fixed to the guides (12) and the guiding plate (13), which, in their turn, are fixed to the mobile table (1) on which the laundry support (14) is located, the motor (4) being driven by means of a control module (15).

Class no.



**RO.4.**

Title EN

**FULL RECYCLABLE SYSTEM FOR THORACIC DRAINAGE**

Authors

Alin-Dragoş DEMETRIAN, Camelia DEMETRIAN, Mihnea Cosmin COSTOIU, Augustin SEMENESCU, Oana-Roxana CHIVU, Ileana Mariana MATEŞ

Institution

University POLITEHNICA of Bucharest

Patent no.

**RO 201800003(U1)**

Description  
EN

The pleural drainage is one of the simplest and most useful surgical interventions in the thoracic surgery, most of the time being the only surgical gesture required to save the patient's life (pneumothorax, hemotorax, pleural empyema, thoracic wounds, etc.). In a thoracic surgery department, most patients will have one or more pleural drains during hospitalization, often for variable periods of time (from one day to several weeks) requiring a connection to a system of pleural drainage ensuring the collection of fluids evacuated from the pleural space (blood, pleural fluid, pus, lymph, etc.) as well as monitoring of air leaks in the pleural space. The invention relates to a complete, reusable thoracic drainage system, that can be used in case of surgical interventions in the thoracic cavity of some patients. The reusable chest drainage system having two container receptacles with communication channels and some interconnecting and connecting connections to the chest cavity and an air suction pumping system, the mentioned recipients are two graduated jars (B, B ') with caps ( (3, 3 ', 3' '), the jars (B, B') being

fixed with two support rods (2, 2 ') to a support plate (1) with legs (a) of a metal support (A), the support plate (1) being fixed and a rod (4) with handle (b) for handling the assembly. The handle also can be used by the patient as a support for mobility.

**Class no.** 4



**RO.5.**

**Title EN** SOLENOID COLUMN

**Authors** Cristian Predescu, Ecaterina Matei, Andra Mihaela Predescu, Andrei Constantin Berbecaru, Ruxandra Vidu, Mirela Gabriela Sohaciu.

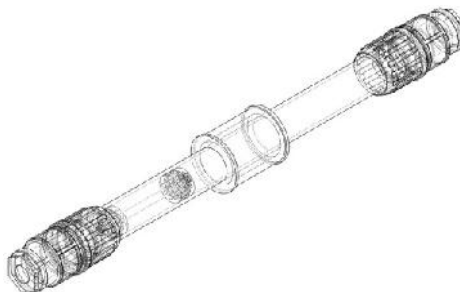
**Institution** University Politehnica of Bucharest, Romania

**Patent no.** Patent application No. 29/657,704/2018

**Description** An operator module solenoid column is described and shown.

**EN** Applications: water purification system to remove heavy metal ions using iron oxide magnetic nanoparticles.

**Class no.** Invention Classification: 1



**RO.6.**

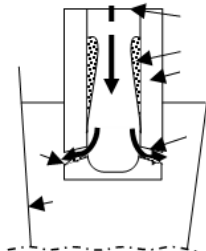
**Title EN** **Protection tube for continuous casting of high purity steel**  
**Authors** Cristian Predescu; Florin Zaman; Mirela Gabriela Sohaciu;  
 Andrei Constantin Berbecaru; George Coman; Mircea  
 Cristian Pantilimon; Zoltan Gheorghe Szekely  
**Institution** **POLITEHNICA University of Bucharest**  
**Patent no.** Patent application No. A/00735 / 27.09.2018

**Description  
EN**

The invention refers to a protection tube that can be utilized between the distributor and crystallizer in the continuous casting of high purity steel and has a specific geometry designed for collecting non-metallic inclusions from the liquid melt in specialized pockets. The technical problem that the invention solves is the risk of clogging through non-metallic impurities deposition on the protection tubes between the distributor and crystallizer in the continuous casting machine for steel and the capture of said non-metallic inclusions in order to obtain a steel blank with high purity. The solution proposed through this invention opposes all other applied solutions because it focuses on pushing the non-metallic inclusions towards the walls of the protection tube, fixing them to the walls and collecting in specific areas. This solution falls inside the technologies of tertiary metallurgy.

The protection tube for the continuous casting of high purity steel, according to the invention presented, has a special interior geometry as a tube with two internal spiraling canals designed to fulfil two special objectives: to fix a rotational motion to the steel melt (and to the non-metallic inclusions) along with a centrifugal driving force and to ensure that the non-metallic inclusions get collected inside the canals on the side of the tube when these particles reach the wall.

**Class no.** 6. Mechanical Engineering - Metallurgy



**RO.7.****Title EN**

**Vertical (electro)magnetic separator of isomagnetic nanoparticles**

**Authors**

Denisa Ficai, Ioana Lavinia Ardelean, Cornalia Ioana Ilie, Manuela Calin, Elena- Valeria Fuior, Adrian Fifere, Mariana Pinteala, Gheorghe Constantin Fundeanu, Anton Ficai, Maya Simionescu, Ecaterina Andronescu

**Institution**

Universitatea POLITEHNICA din București

**Patent no.**

Patent application No *A 01055/05.12.2018*

The invention of "**Vertical (electro)magnetic separator of isomagnetic nanoparticles**" refers to the obtaining of a (electro)magnetic device which allows separation of the magnetic particles from the non-magnetic ones and the separation of the isomagnetic particles by class. The separation technology assumes the passing the magnetic fluid / magnetic suspension through a predefined / controllable magnetic field. From a constructive point of view, the magnetic separator implies one or more magnetic zones in which the isomagnetic particles are separated. In this sense, it is possible to optimize the flow parameters and the magnetic field for the separation zones.

**Class no.**

4



**Figure 1. Experimental model for the vertical magnetic separator: a) elementary b) elementary with two individual separation zones**

**RO.8.****Title EN**

Polymer vesicles and tubes and related technology of manufacturing

**Authors**

Denisa Ficai, Andreea Iliev, Anton Ficai, Violeta Georgeta Trusca, Anca Violeta Gafencu, Sanda-Maria Bucatariu, Gheorghe Constantin Fundeanu, Maya Simionescu,

NATIONAL

**Institution** Ecaterina Andronescu  
**Patent no.** Universitatea POLITEHNICA din București  
 Patent application No A01054/05.12.2018  
 The patent application "**Polymer vesicles and tubes and related technology of manufacturing**" refers to a process for obtaining micro and macrovesicles (hollow capsules) or polymer tubes with predefined characteristics. Among the predefined traceability features can be mentioned; inner and outer diameter; porosity and wall exchange capacity, etc.  
**Description** EN These systems are made of polymers or composites (alginate, chitosan, collagen, ...) in admixture with biologically active substances using coaxial spinnerets with preset diameters. In the case of micro- and macrovesicles, the technology allows the loading of the biological active substance inside the cavity or wall.  
**Class no.**

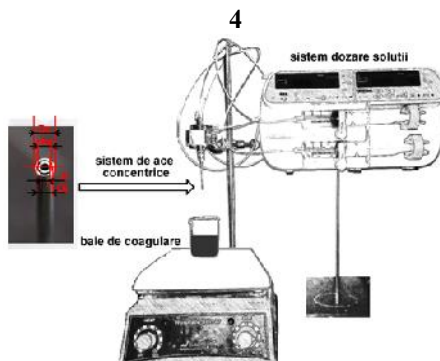


Fig. 1. Experimental device for obtaining polymer / composite tubes or vesicles

## RO.9.

**Title EN** **Botulinum Toxin Guided Injection Device for Spasticity Treatment**  
**Authors** Mihai BERTEANU, Petre Lucian SEICIU  
**Institution** **University Politehnica from Bucharest**  
**Patent no.** Patent application No. A01168/2017  
 The patent presents the Botulinum Toxin Guided Injection Device (GuiDe) for Spasticity Treatment purpose. GuiDe is developed in order to improve the depth precision of the botulinum toxin intramuscular injection.  
**Description** EN Innovative properties:  
 1. The device enhance the accuracy of the botulinum toxin injection in the targeted muscle for a better treatment

- efficiency.
2. Increasing the spasticity treatment efficiency.
  3. The device is very simple being composed by two parts: glider and vernier.
  4. The device is very cheap.
  5. The Device is TRL9 and immediate marketable.

**Class no.**

4

**RO.10.**

**Title EN**

**Mechatronic System for Vertical Alternative Swinging of the Pelvic Girdle**

**Authors**

Petre Lucian SEICIU, Ioan Dan FILIPOIU

**Institution**

**University Politehnica from Bucharest**

**Patent no.**

Patent application No. A00852/2014

The patent presents a mechatronic system (VAS) used for medical rehabilitation of the locomotory disabled persons. VAS solves the problems of achievement, impulsion and assisting the vertical up and down hip movements during the gate cycle in order to obtain a physiological gate with the Center of Mass (COM) trajectory within normal gate.

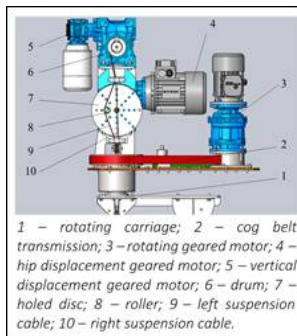
**Description EN**

Innovative properties:

1. Simulates the natural alternate hip vertical movement.
2. Highly versatile: it adapts both to the physical and physiological patient's characteristics and to any medical recovery session request (gait speed, vertical displacement, foot load etc.).
3. Easily adapted to any medical rehabilitation system (mechatronic or robotic) with or without tread mill.
4. Simple and robust construction.

**Class no.**

4



**RO.11.**

**Title EN**

**Equipment for simultaneous machining of microholes through ultrasonically aided electrical discharge machining**

**Authors**  
**Institution**  
**Patent no.**

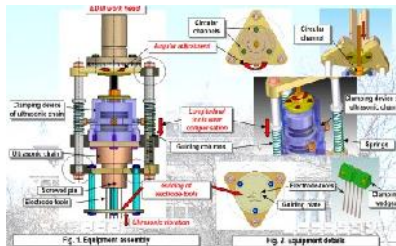
Marinescu Niculae Ion, Ghiculescu Liviu Daniel  
**POLITEHNICA University of Bucharest, Romania**  
RO128720/28.07.2017

**Description EN**

The invention deals with equipment for simultaneous machining micro-holes with high productivity and precision aided by ultrasonic waves, at which the electrodes-tools that execute longitudinal oscillations with ultrasonic frequency are guided within a plate, angularly oriented in respect with workpiece position and longitudinal moved for linear wear compensation.

**Class no.**

5



**RO.12.**

**Title EN**

**Equipment for simultaneous machining of microslots structure through ultrasonically aided electrical discharge machining**

**Authors**  
**Institution**  
**Patent no.**

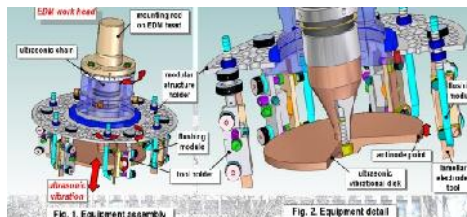
Ghiculescu Liviu Daniel, Marinescu Niculae Ion  
**POLITEHNICA University of Bucharest, Romania**  
RO127948/30.05.2017

**Description EN**

The invention deals with equipment of simultaneously machining of micro-slots structures by electro - discharge machining aided by ultrasonic waves, using some tool-holders containing tools with lamellar shape, the machining being assisted by ultrasonic vibration of a disk so its periphery represents an antinodal point, which oscillates with maximum amplitude in the proximity of the working zone.

**Class no.**

5





**RO.13.****Title EN****Technological innovation of wastewater treatment by flotation using magnetic oxide nanomaterials****Authors**

Cristina Ileana Covaliu, Gigel Paraschiv

**Institution****University Politehnica of Bucharest****Description  
EN**

The appearance and development of nanotechnology gave new and efficient modalities for pollutants removal from wastewaters by using new compounds called nanomaterials, which possess unique structural and morphological properties. Flotation is a conventional method applied very often in wastewater treatment. The aim of this research is to demonstrate the modalities of increasing the efficiency of wastewater treatment by flotation by using two magnetic oxide nanomaterials ( $\text{Fe}_3\text{O}_4$  and  $\text{CoFe}_2\text{O}_4$ ) into a new technological system. Both magnetic oxide nanomaterials were prepared by precipitation method and their structural and morphological characterization was done by XRD and TEM analyses. The results showed that using each of the two magnetic oxide nanomaterials resulted to 100% wastewater treatment efficiency, a high stability of the formed foam and a decreased time needed for the treatment.

**Class no.**

1

**RO.14.****Title EN****High entropy alloys for geothermal environment****Authors**

Laura Elena GEAMBAZU, Ioana CSAKI

**Institution****University Politehnica of Bucharest****PhD Project****Description  
EN**

CoCrFeNiMo high entropy alloy it is known due to its good corrosion and wear resistance. The alloy was previously processed by vacuum arc remelting process, tested in the geothermal environment [1] and promising results were obtained. In this paper CoCrFeNiMo is processed by mechanical alloying and investigated in terms of powders characteristics and microstructures. The powder was pressed, sintered and deposited on carbon steel substrate by Electro Spark Deposition technique.

**Class no.**

6

**RO.15.****Title EN****HfNbTa<sub>x</sub>TiZr high entropy alloy processing by mechanical alloying****Authors**

Ciprian Alexandru MANEA, Ioana CSAKI

**Institution****University Politehnica of Bucharest****PhD Project****Description  
EN**

HfNbTa<sub>x</sub>TiZr high entropy alloy, processed by mechanical alloying will be investigated. The mechanical alloying of this alloy is a challenge itself due to the component powder reactivity. The alloying degree was investigated and also the powder characterization will be determined to establish the most suitable pressing and sintering parameters. Also the consolidated alloy will be processed as electrodes for electrospark deposition to protect steel parts working in geothermal steam.

**Class no.**

6

**University of Agronomic Science  
and Veterinary Medicine Bucharest**

**RO.15A.**

**Title EN** Ecological process to realize a field of cultivation of *Pleurotus eryngii* in free spaces

**Authors** Emanuel Vamanu

**Institution** University of Agronomic Science and Veterinary Medicine – Faculty of Biotechnology

**Patent no.** Patent application No. 00271/18/04/2018

**Description EN** The invention relates to an ecological method for the recovery of agricultural waste widely spread on a farm and for the production of mushrooms of the species *Pleurotus eryngii* in open spaces. The process valorizes unused agricultural land by creating a cultivation field.

**Class no.** 3

**RO.15B.**

**Title EN** Sustainable valorization of by-products from medicinal and aromatic plants industry into value-added products – SuSMAPWaste

**Authors** Project manager Milen Georgiev and the implementation team

**Institution** University of Agronomic Sciences and Veterinary Medicine of Bucharest

**Patent no.**

**Description EN** The main objective of SuSMAPWaste project is the development of green technologies for obtaining a fibrous support material from oleaginous plants waste, enriched with a penta-component formula with multi-target effect (antioxidant, probiotic and detoxifying) from medicinal and

NATIONAL

aromatic plants waste, for human consumption. The project is going to develop tools, methodologies and processes for the valorization of wastes through an integrated bio approach, using advanced biotechnological methods. Research and innovation actions are focused on the valorization of natural compounds with multi-target effect, which are essential for the development of a circular bio - economy and for the smart and efficient use of green resources.

The direct beneficiaries of the project are the companies - manufacturers of natural products based on medicinal, aromatic or oleaginous plants that are producing plants waste. The project will increase the share of biomaterials produced in Europe by increasing the market share of bio-based materials, will allow improved management of renewable biological resources and the opening of new and diversified markets for bio – food and products, will contribute to the decrease of feed import.

*The authors gratefully acknowledge the support obtained through the project SusMAPWaste, SMIS 104323, Contract No. 89/09.09.2016, from the Operational Program Competitiveness 2014-2020, project co-financed from the European Regional Development Fund.*

**Class no.**

**RO.15C.**

**Title EN**

**Multidisciplinary complex project for the monitoring, conservation, protection and promotion of the Romanian cultural heritage – RO-CHER**

**Authors**

Alina Ortan, Iulia Dana Negula, Cristian Moise, Irina Fierascu, Radu Fierascu, Gabriel Rustoiu

**Institution**

**University of Agronomic Sciences and Veterinary Medicine of Bucharest**

**Description  
EN**

Cultural Heritage (CH) may represent one of the decisive factors for the standard of living and the quality of life for different communities, it may contribute to the prevention of cultural globalization, it may support the cultural diversity and it also may positively influence the economic development.

The protection of the cultural heritage represents a major concern for decision-makers, local communities and

## EUROINVENT 2019

European citizens. The RO-CHER project proposes a multi-disciplinary innovative methodology that integrates high level scientific knowledge for safeguarding the cultural heritage and targets the development of synergetic scientific activities in the framework of the four complementary component projects.

The main objective of the project is the development of technologies and materials that integrates the study of the mobile and immobile cultural and historical heritage using new space technologies and classical analysis methods.

Its specific objectives consist of: monitoring the CH objectives with the support of space technologies; developing materials and innovative techniques based on soft nanomaterials; promoting CH by using state-of-the-art technologies of digital reconstruction.

**Class no.**

## Technical University of Cluj-Napoca, România

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### RO.16.

<b>Title EN</b>	<b>Amplifier for bipolar current pulses, in hybrid bridge topology with symmetrical drive</b>
<b>Authors</b>	Prof.Dr.Ing. Radu Arsinte / Prof.Dr.Ing. Dorin Petreuş
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent OSIM: RO128681-B1/30.01.2018
<b>Description EN</b>	The invention is an amplifier for bipolar current pulses, realized in full bridge architecture, using either MOS or bipolar switching elements, driven externally with complementary currents. It can be used to generate precise controlled current pulses in inductive loads (displays, electrical micro-motors, relays). The special topology allows obtaining a temporary idle state, if necessary, with a negligible consumption during this state.
<b>Class no.</b>	5

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### RO.17.

<b>Title EN</b>	<b>Method for dynamically modifying frequency in an arithmetic unit based on online error detection</b>
<b>Authors</b>	Joan Figueras Pamies, Liviu Cristian Miclea, George Dan Mois
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent OSIM: RO130282-B1/30.03.2018
<b>Description EN</b>	The invention refers to a method for dynamically modifying the frequency in an arithmetic unit within a digital signal processing system having adders or multipliers contained in the critical path, based on on-line error detection. Error detection is performed by using a concurrent error-detection scheme based on low cost residual codes with base 7. Depending on the errors detected by the concurrent scheme, a unit responsible for the dynamic frequency scaling acts according to a previously established control law resulting from the requirements of the application where the circuit is being used. By using the invention, considerable time and energy savings are obtained when performing arithmetic operations at the cost of a small number of errors.
<b>Class no.</b>	10

**RO.18.****Title EN****Sedimentation device for obtaining sintered porous materials, with graded structure****Authors**

Prof.dr.ing. Ioan Vida-Simiti, Sl.dr.ing. Gyorgy Thalmaier, dr.ing. Valentin Moldovan, Ing. Ovidiu Nasca, Sl.dr.ing. Niculina Sechel

**Institution****Technical University of Cluj-Napoca****Patent no.**

Patent OSIM: RO128489-B1/27.04.2018

**Description****EN**

The invention relates to a method and a device for obtaining sintered materials with gradual porosity. The elaboration method of porous gradual structures concerns the gravitational sedimentation of powders from a suspension followed by sintering. The sedimentation device has four glass columns used as sedimentation chambers and four die equipped with drainage holes for sedimentation liquid. Such materials, with gradual porosity, can be used as filters or porous membranes in various industrial and medical applications.

**Class no.**

7

**RO.19.****Title EN****Device for cold start process of internal combustion engines fueled with biofuels****Authors**

Mariasiu Florin Emil, Burnete Nicolae, Varga Bogdan Ovidiu

**Institution****Technical University of Cluj-Napoca****Patent no.**

Patent OSIM: RO127032-B1/30.05.2018

**Description****EN**

The invention relates to a cold start device for an internal combustion engine fueled with biofuel. The device, according to the invention, consists of an ultrasound emitting system who transmit (by an emitter) ultrasounds directly in the mass of biofuel (inside of a filtering battery system), producing an increase in its temperature. The ultrasounds emission system is controlled by a temperature control module, according to the temperature required to achieve the optimum physical parameters (viscosity, density) of biofuel, for a efficient cold start process. The invention has the advantages of a simple, easy-to-install system (no major engineering modifications in engine construction), reliability in operation and energy efficiency.

**Class no.**

8

**RO.20.**

**Title EN** **Electromechanical actuator with electronic control device**  
**Authors** Stefan Breban, Petre-Dorel Teodosescu, Adriana-Voica Neag, Mihai Chirca  
**Institution** **Technical University of Cluj-Napoca**  
**Patent no.** Patent OSIM: RO131166-B1/30.08.2018

**Description  
EN**

The invention presents an electro-mechanical actuator with electronic control device for the rotary drive of any components or equipment that require a maximum rotation of 180 degrees. The electromechanical actuator according to the invention is composed of a rotor having one or more permanent magnets with radial magnetization, mounted / fitted by means of a clamping bushing, or glued, on a shaft; the shaft being mounted on two bearings, each bearing being integrated in a plate made from a high magnetic permeability material; from coils placed around the stator poles, the stator poles being arranged on either side of the magnet / magnets placed on the rotor; the stator poles are mounted on some supports with high magnetic permeability, the supports are fixed on the ends of some plates to form together a rigid assembly; a circular torsion spring which is mounted around the rotor shaft, the spring having one end attached to one of the plates made from high magnetic permeability material, and the other end being fixed by means of a connecting element to the rotor axis; an electronic device that provides power to the coils and thus allows the movement between the two homing positions.

**Class no.**

5

**RO.21.**

**Title EN** **Wheel with electric motor for electric vehicles**  
**Authors** Jurca Nicolae Florin, Ruba Mircea  
**Institution** **Technical University of Cluj-Napoca**  
**Patent no.** Patent OSIM: RO131110-B1/28.09.2018

**Description  
EN**

The patent refers to a modular wheel with an integrated modular electrical motor dedicated for electrical vehicles. Using this wheel with an inner motor having modular magnetic and electrical circuit, facilitates maintenance operations for a such systems making them more reliable and simple. Therefore, is not mandatory to be a trained person for the maintenance, thus the operations can be executed by

the driver with a special key that can be introduced as standard on the electric vehicles.

**Class no.**

8

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**RO.22.**

<b>Title EN</b>	<b>Chemical method for preparing epitaxial films of strontium-doped lanthanum manganite La<sub>0.66</sub>Sr<sub>0.33</sub>MnO<sub>3</sub> (LSMO)</b>
<b>Authors</b>	Mircea NĂSUI, Traian PETRIȘOR Jr, Ramona Bianca MOȘ, Amalia MESAROȘ, Mihai Sebastian GABOR, Lelia CIONTEA, Traian PETRIȘOR
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent OSIM: RO131325-B1/30.10.2018
<b>Description EN</b>	The invention relates to a chemical method for preparing epitaxial films of strontium-doped lanthanum manganite La <sub>0.66</sub> Sr <sub>0.33</sub> MnO <sub>3</sub> , meant to be used in magnetic field sensors. According to the invention, the method consists in preparing a precursor solution by mixing metal sources, such as lanthanum acetylacetonates, manganese and strontium acetate which are separately dissolved in propionic acid, the resulting precursor solution being then concentrated by vacuum distillation, up to a concentration of 1...2 M, after which it is deposited by centrifugation onto SrTiO <sub>3</sub> monocrystalline substrates, at rotary speeds of 4000 rpm, for 60 s, the raw films being further subjected to a one-stage heat treatment, in air, at a heating rate of 5 degrees C/min, up to the temperature of 500 degrees C and a heating rate of 10 degrees C/min, up to the temperature of 1100 degrees C, they being maintained at this temperature for 2 h, after which they are cooled down to the ambient temperature at a rate of 10 degrees C/min, the resulting films exhibiting an advanced orientation degree.
<b>Class no.</b>	7

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**RO.23.**

<b>Title EN</b>	<b>Analog electronic transducer for dc power measurement</b>
<b>Authors</b>	Dr. ing. Munteanu Radu Adrian, Dr. ing. Dulf Eva-Henrietta, Dr. ing. Festila Clement, Dr. ing. Munteanu Radu, Dr. ing. Todoran Gheorghe-Ion
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent OSIM: RO128666-B1/29.11.2018

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The technical problem solved by the invention is to provide an electronic circuit with simplified structure and reduced sensitivity to various external factors (e.g. variation of the ambient temperature, variation of supply voltages), with extended linear operating area and high measurement accuracy. The primary information is the measurement circuit's voltage ( $U_m$ ) and current ( $I_m$ ), using a shunt ( $\square$ ) for the latter.

The analogue electronic power transducer, according to the invention, is based on the PWM principle and on the use of the internal negative feedback in a closed loop, in order to generate at the output of the circuit a voltage proportional to the measured power. The transducer consists on a square wave generator with controlled duty cycle (PWM), a circuit composed by two counter-connected optocouplers which effectively modifies the square wave duty cycle, a control circuit of the two optocouplers, a circuit composed of two ON/OFF transistors ("switches") and two low-pass filter circuits used to smooth the square waves generated by the switches. To extend the linearity of the transducer, the modulator is included in a highly amplified negative feedback loop. The essential advantage, according to the invention, lies in the simple way of achieving the proportionality between the duty cycle and the output voltage:  

$$U_0 = \mu \cdot \rho \cdot I_m = U_m / E_{ref} \quad \rho \cdot I_m = \rho / E_{ref} \cdot U_m \cdot I_m = K \cdot P$$

**Description**  
EN

**Class no.**

5

**RO.24.**

**Title EN**

**Device and method for testing the asymmetric gear teeth**

**Authors**

dr. ing. Ravai Nagy Sándor, dr. ing. Lobonțiu Mircea

**Institution**

**Technical University of Cluj-Napoca**

**Patent no.**

Patent OSIM: RO128055-B1/28.07.2017

**Description**  
EN

The invention relates to a device and a method of testing the teeth of asymmetric gears, intended to be used in determining the maximum static loading force on a teeth of the asymmetrical gearwheel, since the design of the gear from a gearbox.

**Class no.**

6

**RO.25.**

<b>Title EN</b>	<b>Portable wire driven rehabilitation device</b>
<b>Authors</b>	Cafolla Danielle-Cassino, Chaparro-Rico Betsy Dayana Marcela, Russo Mateo, Carbone Giuseppe, Pîslă Doina Liana, Vaida Liviu Călin, Nadăș Iuliu Adrian
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent application OSIM no. A/00559/31.07.2018
<b>Description EN</b>	<p>This patent presents a cable-driven robotic system capable of performing the medical rehabilitation for the upper and lower limbs of a patient. The proposed system has a light portable structure, adjustable to the user anthropometric dimensions, easy to use including in patient own environment. The device has an innovative wire tensioning system and an adjustable, specifically designed, end-effector.</p> <p>The patent presents results from the research activities of the project ID 37_215, MySMIS code 103415 “Innovative approaches regarding the rehabilitation and assistive robotics for healthy ageing” cofinanced by the European Regional Development Fund through the Competitiveness Operational Programme 2014-2020, Priority Axis 1, Action 1.1.4, through the financing contract 20/01.09.2016, between the Technical University of Cluj-Napoca and ANCSI as Intermediary Organism in the name and for the Ministry of European Funds.</p>
<b>Class no.</b>	4

**RO.26.**

<b>Title EN</b>	<b>Inovative cable system for motion rehabilitation of upper limbs</b>
<b>Authors</b>	Giuseppe Carbone, Doina Pîslă, Călin Vaida, Paul Tucan, Iuliu Nadăș
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent application OSIM no. A/00558/31.07.2018
<b>Description EN</b>	<p>The proposed patent seeks to overcome the current limitations of existing solutions by providing a robotic cable-driven system that can achieve a wide range of motricity assistance while allowing patients easy access to exercises for upper limb medical rehabilitation. The invention describes two operational scenarios for the proposed invention with reference to a human being in a wheelchair and a human being on a hospital / in-house bed.</p>

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The patent presents results from the research activities of the project ID 37\_215, MySMIS code 103415 “Innovative approaches regarding the rehabilitation and assistive robotics for healthy ageing” cofinanced by the European Regional Development Fund through the Competitiveness Operational Programme 2014-2020, Priority Axis 1, Action 1.1.4, through the financing contract 20/01.09.2016, between the Technical University of Cluj-Napoca and ANCSI as Intermediary Organism in the name and for the Ministry of European Funds.

**Class no.**

4

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### RO.27.

**Title EN**

**PProHep-LCT- parallel robot for laparoscopic treatment of hepatic tumors**

**Authors**

Plitea Nicolae, Pîslă Doina Liana, Vaida Liviu Călin, Gherman Bogdan George, Tucan Paul George Mihai

**Institution**

**Technical University of Cluj-Napoca**

**Patent no.**

Patent application OSIM no. A1017/03.12.2018

**Description  
EN**

The presented invention relates to a robotic system for laparoscopic treatment of inoperable hepatic tumors, a system consisting of two robotic modules, the first module being for positioning the ultrasound probe and the second module is for precisely positioning the treatment delivery needle. The hepatic laparoscopic probe guidance module has 5 degrees of freedom and the second module (to insert the treatment delivery needle) is similar to the guiding probe module with 5 degrees of freedom.

This work was supported by a grant of the Romanian Minister of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0221/59PCCDI/2018 (IMPROVE), within PNCDI III"

**Class no.**

4

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### RO.28.

**Title EN**

**Modular parallel system for guiding laparoscopic ultrasound probe and instruments for hepatic tumour treatment**

**Authors**

Vaida Liviu Călin, Pîslă Doina Liana, Plitea Nicolae, Gherman Bogdan George, Tucan Paul George Mihai

**Institution**

**Technical University of Cluj-Napoca**

**Patent no.**

Patent application OSIM no. A01143/24.12.2018

NATIONAL

<b>Description</b> EN	<p>The invention refers to a modular parallel system for guiding laparoscopic ultrasound probe and instruments for hepatic tumor treatment. The robotic system is composed by two robotic modules one for guiding the laparoscopic ultrasound probe, the other one for guiding the instrument for treatment/drug delivery. The modular parallel robotic system HeRo is composed by two robotic modules each having 5 degrees of mobility, one for guiding the laparoscopic ultrasound probe and the other one for guiding the needle. By engaging the motors of the parallel robotic modules of the system for guiding laparoscopic ultrasound probe and instruments for hepatic tumors it is realized the positioning and orientation of the hepatic ultrasound probe and of the instrument for laparoscopic treatment of the inoperable hepatic tumors.</p> <p>This work was supported by a grant of the Romanian Minister of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0221/59PCCDI/2018 (IMPROVE), within PNCDI III"</p>
<b>Class no.</b>	4

**RO.29.**

<b>Title</b> EN	<b>Virtual biopsy achievement, through advanced image analysis and recognition methods, for the automatic and computer assisted diagnosis of the hepatocellular carcinoma (HCC)</b>
<b>Authors</b>	Delia Mitrea, Sergiu Nedeveschi, Paulina Mitrea, Tiberiu Marița, Raluca Brehar, Flaviu Vancea, Radu Badea, Monica Platon(Lupșor), Mihai Socaciu, Horia Ștefănescu
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent application OSIM no. A01135/21.12.2018
<b>Description</b> EN	<p>This work claims for the virtual biopsy of the Hepatocellular Carcinoma (HCC), achieved through computerized methods, from ultrasound images, based on the textural imagistic model of this tumor. HCC is the most frequent malignant liver tumor, appearing in 70% of the liver cancer cases. The textural imagistic model of HCC consists of the relevant textural features, able to distinguish HCC from similar tissues and of the specific values associated to these features (arithmetic mean, standard deviation, probability distribution). The virtual biopsy aims to replace the real biopsy, which is the golden standard nowadays, but it is</p>

invasive, dangerous, as it can lead to the spread of the tumor inside the human body. Ultrasonography is a non-invasive, undangerous, unexpensive medical investigation method which is also repeatable and can be successfully employed in order to monitor the evolution of various pathologies. The specific advanced methods for computerized processing, based on the most powerful techniques for medical image analysis and recognition, might constitute an efficient complement to the classical medical examination, leading to a considerable increase of the diagnostic performance. Thus, both classical and advanced methods for texture analysis, in combination with powerful classifiers, are involved in order to build and assess the textural imagistic model of HCC, and also in order to perform automatic and computer aided or automatic diagnosis of liver cancer. A new approach is still under development, involving the implementation of deep learning techniques, aiming to refine the textural model of HCC and to improve the automatic diagnosis accuracy.

Class no.

4

**RO.30.****Title EN****Programable method for current sensor fault detection of 3-phase electronic inverters****Authors**

Mircea Ruba

**Institution****Technical University of Cluj-Napoca****Patent no.**

Patent application OSIM no. A/00156/07.03.2018

**Description****EN**

The invention refers to a method of detecting the current sensors faults of 3-phase inverters that is running at a rate of 250 time higher than the rate of the actual control loop. It permanently monitors readings from the sensors and computes the difference between the reference values and the actual measured ones. The difference then is compared with an adaptive threshold. The comparison yields a fault occurred on a certain sensor and decides the replacement of the faulted measurement with an estimated one and also modifies the gains of the control loop's PI regulators, adapting them to the new operational regime. In the same time, it stops the fault detection procedure for a certain period of time till the eventual occurred transient due to the current replacement passes. By this, the detection, isolation and compensation of the fault occurred is handled by the strategy in-between two consecutive iterations of the actual

inverter control loop. The fault detection procedure executes 250 calculations (detection) between two consecutive calculations of the control loop.

**Class no.** 5

**RO.31.**

**Title EN** **Multilayered composite panel and the method used for obtaining it**

**Authors** Tămaș-Gavrea Daniela-Roxana, Iștoan Raluca, Tiuc Ancuța Elena

**Institution** **Technical University of Cluj-Napoca**

**Patent no.** Patent application OSIM no. A00288/24.04.2018

The invention relates to a multilayered composite panel and the method of obtaining it. The panel has two rigid perlite-based boards, reinforced with natural flax fiber nets, with a compact layer of flax fiber between them, using white cement as a binder. The purpose of the panel is to improve the quality of life and human health in buildings' environment by providing optimum acoustic comfort based on users' requirements.

**Description EN** The acoustic absorption coefficient of the non-perforated composite panel is high at medium frequencies. The peak of sound absorption coefficient of 0.98 is reached at the frequency of 500 Hz.

In order to optimize the sound absorbing properties of the multilayered composite panel, perforations were made on one of the rigid boards of the panel. Thus, perforated panels have acoustic absorption coefficients above 0.70 for a wider frequency range, of 500-3000 Hz. The maximum absorption coefficient is 0.98 at the frequency of 900 Hz.

**Class no.** 7

**RO.32.**

**Title EN** **Braking mechanism with S cam**

**Authors** Laze Daniel

**Institution** **Technical University of Cluj-Napoca**

**Patent no.** Patent application OSIM no. A/00151/05.03.2018

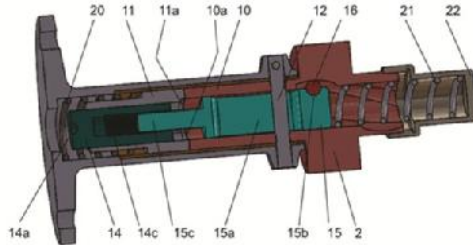
**Description EN** The invention relates to an "S" cam braking mechanism having an actuating system (1) consisting of a body (8) supporting a shaft (10), and an axial movable assembly

NATIONAL

formed by the pusher shaft (14) and the spindle (15) with balls (16) sliding in the grooves (10c) and causing the cam (2) to rotate. Wear compensation and holding of the shoes (4) in the immediate vicinity of the drum (5) is made with a mechanical reaction loop formed by the sawtooth coupling (10a / 11a) and the threaded assembly (14c / 15c). Figure 1.

**Class no.**

8



**RO.33.**

**Title EN**

**Ecological method for recyclable wastes valorization**

**Authors**

Mihai Andrei Platon, ing. Mihaela Ștef, ing. Cristiana Popa, Șl.dr.ing. Ancuța-Elena Tiuc, Conf.dr.ing. Ovidiu Nemeș

**Institution**

**Technical University of Cluj-Napoca**

**Patent no.**

Patent pending

In this project, research is upheld for developing innovative technologies for reuse and keep, if possible, in economic chain, a material.

**Description**

**EN**

The aim of this project is to obtain and test a composite material based on fiberglass, rubber, wood and plastic waste. Three mixes are studied: fiberglass with PMMA, fiberglass with PMMA and rubber granules or sawdust.

The obtained composite materials are suitable for board production, with improved features, compared with other products on the market.

**Class no.**

1

<b>RO.34.</b>	
<b>Title EN</b>	<b>Recovery of sawdust, recycled rubber particles and textile waste by making composite materials</b>
<b>Authors</b>	Ancuța-Elena Tiuc, Anca Mădălina Belțan, Ovidiu Nemeș, Horațiu Vermeșan
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Patent pending
<b>Description EN</b>	<p>Research focuses on the use of alternative raw materials and on finding new solutions to reduce noise in the context of issues related to environment, is of great interest and great actuality. Negative effects of pollution intensified research on acoustic materials based on renewable resources, which can lead to viable alternatives to conventional materials for current and future applications. Composite materials with fir sawdust, used rubber granules and textile waste; Aracet (polyvinyl acetate) and hydrated lime as a binding material, were used in this research. Materials acoustic absorption coefficient was found using the impedance tube method. From the analysis of the experimental results, it can be observed that for the materials obtained in this research, the acoustic absorption coefficient value increased with the increase of the fir woods percentage used. The materials obtained using polyvinyl acetate as binder have better sound absorption properties than those obtained with lime-hydrated lime as binder. The presence of rubber granules in the material composition leads to an improvement in the sound absorbing properties in the 800-1600 Hz frequency range. The material obtained from 25% textiles, 75% fir wood, and Polyvinyl acetate as binder has the best acoustic absorption coefficient, of 0.97 at the frequency of 1500 Hz.</p>
<b>Class no.</b>	1

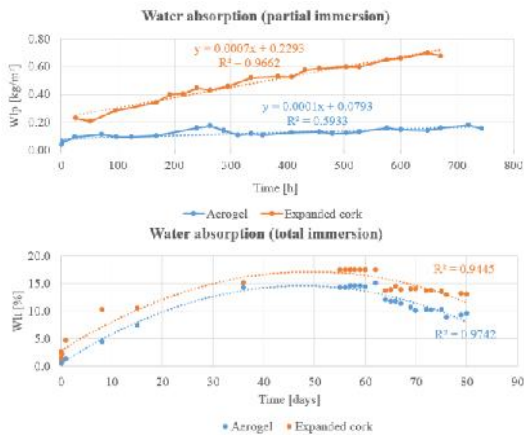
<b>RO.35.</b>	
<b>Title EN</b>	<b>The future of buildings thermal insulations - Aerogel and Expanded Cork</b>
<b>Authors</b>	Bucur Adrian, Moga Ligia Mihaela
<b>Institution</b>	<b>Technical University of Cluj-Napoca</b>
<b>Patent no.</b>	Nowadays, the planet faces severe climate changes, one possible reason being the energy intensive and polluting human activities. In this matter, the buildings sector is responsible for 40% of the total energy consumed, 40% of



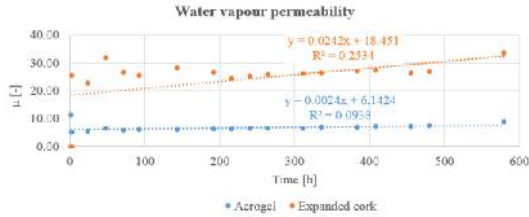
the carbon dioxide emissions and also for 50% of the total raw materials used. As a consequence, urgent measures are needed in order to reduce all these indicators for a sustainable future.

Following this idea, aerogel may be a step forward, being a nano insulation material for buildings with a significantly lower thermal conductivity compared to common thermal insulations. Hence, it requires a reduced thickness for a similar thermal performance. A second material proposed in this work is the expanded cork, a 100% natural insulation material which is not used at its full potential. It has a thermal performance comparable to expanded polystyrene, but a better hygric behavior and also it is one of the few building materials with a negative carbon footprint.

One of the known issues of the aerogel is that its performance is influenced by the climatic conditions. Since there is a reduced practical expertise in this field, the project presents the measurements results on the aerogel and expanded cork hygrothermal properties. The outcomes show that both materials have a good water permeability and a reduced water absorption capacity, two positive aspects for any building insulation. Another conclusion is that increased humidity may influence the aerogel thermal performance. Therefore, the material requires additional protection in this regard.



## EUROINVENT 2019



**Description**  
**EN**  
**Class no.**

Innovative Research - 7. Buildings and Materials

### RO.36.

**Title EN**

**Composite steel-concrete columns**

**Authors**

Maria Pop, Cristina Campian

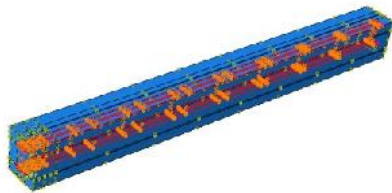
**Institution**

**Technical University of Cluj-Napoca**

The most important and common combination of the construction materials is the one between structural steel and concrete. Nowadays composite elements applies mostly in multi-story structures and industrial buildings. The solution of fully encased composite column is a competitive solution for seismic and non-seismic areas, due to the excellent seismic performance.

The study is based on two experimental programs, following the differences behavior reactions to the external forces of two versions of the composite columns.

**Description**  
**EN**



The numerical study for the composite steel-concrete columns was conducted in the finite element program Abaqus 6.11.

To simulate the behavior of the composite steel-concrete elements, it was necessary to model the concrete, steel profile, reinforcement and the bounding between these components. The geometrical nonlinear effects are taking into account in the FEM analysis

**Class no.**

7

NATIONAL

338

<b>RO.37.</b>	
<b>Title EN</b>	<b>Study to Achieving a Class of Road Concrete with Slag Powder Addition at the Cement Mass and Substitution with Artificial Aggregates</b>
<b>Authors</b>	Nicula Liliana Maria , Corbu Ofelia, Iliescu Mihai
<b>Institution</b>	<b>Technical University of Cluj-Napoca, Faculty of Civil Engineering.</b>
<b>Patent no.</b>	-
<b>Description EN</b>	<p>In order to notice the influence of slag in the form of powder used as an addition to the cement mass and the substitution of natural aggregates with artificial aggregates from crushed and sorted slag, first of all, mixtures of mortars were made for a reduced volume of material. In the mixes design of new road concrete we have taken into account the results obtained on the most representative mortar mixes. We chose mixtures of mortar with 15% addition of slag powder in the cement mass and those in which the 0/4 mm natural aggregate was substituted in a ratio of 20%, 40%, and 60% with artificial aggregates of crushed and sorted slag from the by-products stockpiles resulting from the process of obtaining the cast iron in the furnaces. The intended objective is to obtain a BcR 5.0 road concrete class that can be used in all categories of traffic.</p> <p>From the results obtained on mortar and concrete mixtures, it can be seen that compressive strengths and flexural tensile strengths remain close both in mortars and in concretes. Also, the results show that the control mixture falls into the BcR5.0 road concrete class and the new mixtures are very close to it.</p>
<b>Class no.</b>	7

<b>RO.38.</b>	
<b>Title EN</b>	<b>Influence of Slag Powder in the Cement Mortar Mixes on the Characteristics of Compactness, and Freeze-Thaw Strength</b>
<b>Authors</b>	Nicula Liliana Maria , Corbu Ofelia, Iliescu Mihai
<b>Institution</b>	<b>Technical University of Cluj-Napoca, Faculty of Civil Engineering.</b>
<b>Patent no.</b>	-
<b>Description</b>	Worldwide there is a clear imperativeness to reduce the

**EN** consumption of non-renewable raw materials. The aim of the research is to obtain new ecological materials with applicability in the construction field, but also to efficiently manage this products by eliminating it completely and re-introducing it into the economic circuit. We envisaged the use of slag products as a material cementitious characteristics or as artificial aggregates, so that materials embedded in construction produce as little environmental impact as possible. After cooling, the blast furnace slag product was used in the new mortar mixes in two forms: in the form of a powder product milled from the granulated slag, and in the form of an aggregate made of non-granulated slag, sorted to the sized of 0/4 mm. Ground-granulated slag in the form of a powder below 63  $\mu\text{m}$  was used as an addition to the cement mass, and the newly obtained artificial aggregate, sorted to 0/4 mm, was used in various percentages for replacing the natural aggregates in the control mix.

The results show that the combined use of slag powder as an addition to the cement mass and artificial slag aggregates, regardless of the percentage of substitution of natural aggregates in the mortar mortar mix, has led to the development of new mortar mixes with higher compaction than the control mortar. The higher filling rate due to the use of ground slag has influenced the increase of compressive strengths and freeze-thaw strengths from the repeated freeze-thaw action for new cement mortar mixes with blast furnace slag, as compared to the control mortar mix

**Class no.**

7

**“Iuliu Hatieganu” University of Medicine and Pharmacy  
Cluj-Napoca**

**RO.39.****Title EN**

Dual grid system for laparoscopically assisted brachytherapy guidance for hepatic tumors (with intra-abdominal grid of magnetic spheres)

**Authors**

Florin Graur, Nadim Al Hajjar, Calin Vaida, Emil Moiş,  
Doina Pîsla, Luminița Furcea, Călin Popa, Radu Elisei

**Institution**

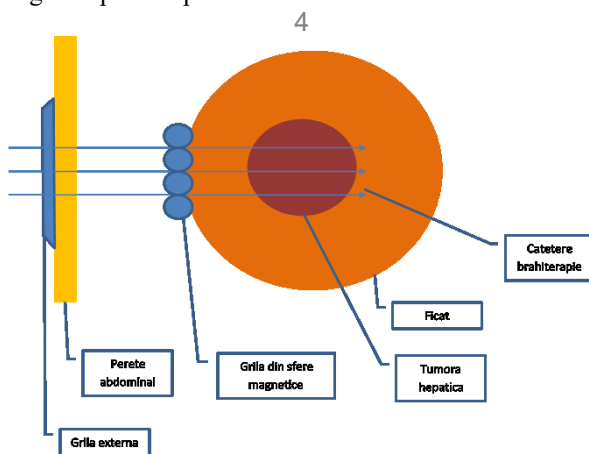
**University of Medicine and Pharmacy „Iuliu Hatieganu”  
Cluj-Napoca**

**Patent**

Nr. inreg. OSIM A/01141-27.12.2018 Patent pending

**Description  
EN**

The invention relates to a system of grids which are used for guidance of brachytherapy probes in the treatment of unresectable liver tumors assisted by laparoscopy. The system consists of two grids, including an external grid placed on the skin of the abdominal wall and one inserted through the laparoscopic trocar into the abdominal cavity and placed on the liver capsule. The advantages are the use of a magnetic sphere chain that is self-assembled to form the intra-abdominal grid. Also due to the construction mode it is easy to disassemble and extract from the abdominal cavity through a laparoscopic trocar

**Class no.**

**RO.40.****Title EN**

Dual grid system for laparoscopic assisted brachytherapy guidance for hepatic tumors (with intra-abdominal plastic grid)

**Authors**

Florin Graur, Nadim Al Hajjar, Calin Vaida, Emil Moiş, Doina Pîsla, Luminița Furcea, Călin Popa, Radu Elisei

**Institution**

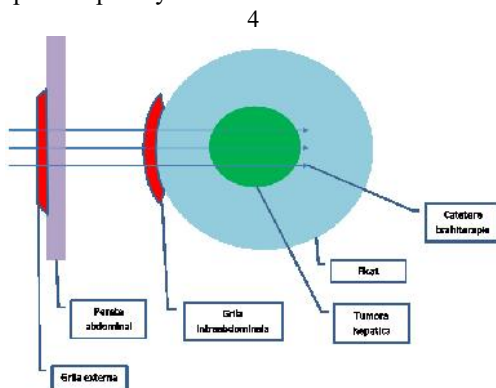
**University of Medicine and Pharmacy „Iuliu Hatieganu” Cluj-Napoca**

**Patent**

Nr. inreg. OSIM A/01142-27.12.2018 Patent pending

**Description EN**

The invention relates to a dual grid device used for guiding brachytherapy probes in the treatment of non-resectable liver tumors assisted by laparoscopy. The system consists of two grids, including an external grid placed on the skin of the abdominal wall and one inserted through the laparoscopic trocar into the abdominal cavity and placed on the liver capsule. The advantages are the use of perforated plastic strips assembled in a square shape, these bands being easily inserted through a 10 mm trocar and assembled inside the abdominal cavity and also disassembled and extracted by trocar laparoscopically.

**Class no.****RO.41.****Title EN**

**Salivary optical sensor implemented by the lateral coupling of a side-emitting optical fiber and a fluorescent optical fiber integrated into an intra-oral device**

**Authors**

Faragó Paul\*, Gălătuș Ramona-Voichița\*, Groza Robert-Gheorghe\*, Băbțan Anida-Maria\*\*, Feurdean Nicoleta Claudia\*\*, Petrescu Bianca Nausica\*\*, Boșca Adina Bianca\*\*, Ilea Aranka\*\*

NATIONAL

**Institution** \* **Technical University of Cluj-Napoca**  
 \* ,\*\* „Iuliu Hațieganu” **University of Medicine and Pharmacy of Cluj-Napoca**

**Patent no.** Patent application No. OSIM A 00136/27.02.2019

**Abstract**

This invention refers to a distributed salivary sensor for the detection of salivary compounds (e.g. advanced glycation products), implemented around the optical coupling of a side-emitting optical fiber (1) and a fluorescent optical fiber (2), and integrated into an intra-oral device (4). The sensing technique is based on the fact that the analyte, interposed in-between the two fibers on the sensing area (6), filters the light radiation that is coupled from the side-emitting fiber into the fluorescent fiber and consequently changes the emission spectrum of the fluorescent optical fiber: gain, attenuation or the coupling of new spectral components.

**Description**  
**EN**

The technical problem solved by this invention is distributed salivary sensing performed with optical means, without the binding step of the analyte using a chromophore. Thus, our invention adopts a label-free sensing technique that exploits the potential of body fluids to alter the spectral parameters of the light coupled from the side-emitting fiber into the fluorescent optical fiber.

Our invention has a preventive role because our goal is to detect the presence of salivary compounds as bio-marker markers of disease, but also a method of dispensarization of patients to evaluate the effectiveness of applied therapies.

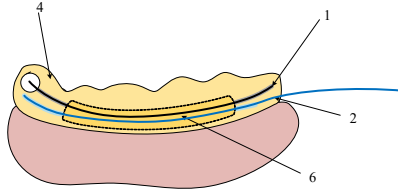
**Applications. Advantages.**

The applications of our invention are summarized as: real-time detection of salivary compounds; purely optical sensing of salivary compounds, label-free sensing of salivary compounds, easy integration into an intra-oral device and non-invasive patient monitoring.

**Class no.**

4

**Funding:** This study was supported by the COFUND-ERA-HDHL ERANET Project, European and International Cooperation - Subprogram 3.2 - Horizon 2020, PNCDI III Program - Biomarkers for Nutrition and Health – “Innovative technological approaches for validation of salivary AGEs as novel biomarkers in evaluation of risk factors in diet-related diseases”, no 25/1.09.2017.



RO.42.

**Title EN** **Cytoblock preparations for early diagnosis of premalignant and malignant oral lesions, correlated with ultrasonography of oral mucosa**

**Authors** Boşca Adina Bianca<sup>1</sup>, Ilea Aranka<sup>2</sup>, Tăulescu Marian<sup>3</sup>, Negru Mihai<sup>3</sup>, Băbțan Anida-Maria<sup>2</sup>, Petrescu Nausica Bianca<sup>2</sup>, Feurdean Claudia Nicoleta<sup>2</sup>, Mirică Ioana Codruța<sup>2</sup>, Pârvu Alina Elena<sup>4</sup>, Dinte Elena<sup>5</sup>, Mișu Carmen Mihaela<sup>1</sup>, Melincovici Carmen<sup>1</sup>, Șovrea Alina<sup>1</sup>, Constantin Anne Marie<sup>1</sup>, Buhățel Dan<sup>2</sup>, Ionel Anca<sup>2</sup>, Sava Arin<sup>2</sup>, Uriciuc Willi Andrei<sup>2</sup>, Lazăr Adela Cristina<sup>2</sup>, Bordea Ioana Roxana<sup>2</sup>, Pop Andrea Simona<sup>2</sup>, Cămpian Radu Septimiu<sup>2</sup>

**Institution** <sup>1</sup>Department of Histology, Faculty of Medicine, University of Medicine and Pharmacy, Cluj-Napoca, Romania  
<sup>2</sup>Department of Oral Rehabilitation, Oral Health and Dental Office Management, Faculty of Dental Medicine, University of Medicine and Pharmacy, Cluj-Napoca, Romania  
<sup>3</sup>Department of Pathology, University of Agricultural Sciences and Veterinarian Medicine, Cluj-Napoca, Romania  
<sup>4</sup>Department of Physiopathology, Faculty of Medicine, University of Medicine and Pharmacy, Cluj-Napoca, Romania  
<sup>5</sup>Department of Pharmaceutical Technology and Biopharmaceutics, Faculty of Pharmacy, University of Medicine and Pharmacy, Cluj-Napoca, Romania

**Description EN** Oral cancer is a major health problem due to the difficult diagnosis in early stages as well as the reduced quality of life and the low survival rate inherent in the advanced lesions. In order to achieve a lower morbidity and mortality associated with the oral cancer, it is necessary to optimize the preventive screening for early detection of the suspicious premalignant lesions. Cytoblock preparations correlated with oral ultrasonography could be used complementary to a clinical examination for reliable clinical screening.

The aim of this research is to investigate the accuracy of the



histopathological examination based on the cytoblock preparations for the diagnosis of the early stages in oral carcinomas. The histopathological findings will be correlated with the data from the ultrasonographical examination of the oral mucosa.

Epithelial cells exfoliating from the oral mucosa are collected with a Cytobrush, fixed using absolute ethanol, suspended in HistoGel™ and included in paraffin to obtain the cytoblocks. Cytoblock preparations using routine hematoxylin-eosin or immunohistochemical stains are microscopically examined to assess various changes in the exfoliated oral epithelial cells.

Point of care ultrasound is increasingly emerging as a field that can be applied in various clinical situations. Oral point of care ultrasound could be performed by primary care physicians in the dental office to investigate unclear findings in the oral-facial area. Ultrasound examinations employing transducers at frequency of 18 MHz and 38 MHz are used for identifying the oral lesions, for measuring their size and for detecting the changes in the adjacent tissues.

**Applications. Advantages.**

The goal of oral epithelial cells cytoblocks and oral mucosa ultrasonography as novel preventive screening methods is to detect the premalignant or early malignant lesions. The screening is beneficial especially in patients with history of tobacco and alcohol use, who have higher relative risks of developing oral cancer. Cytoblocks and oral ultrasonography are non-invasive methods, feasible for the primary care physicians and a cost-effective option for early recognition of premalignant oral lesions.

**Funding:** This study was supported by the COFUND-ERA-HDHL ERANET Project, European and International Cooperation - Subprogram 3.2 - Horizon 2020, PNCDI III Program - Biomarkers for Nutrition and Health – “Innovative technological approaches for validation of salivary AGEs as novel biomarkers in evaluation of risk factors in diet-related diseases”, no 25/1.09.2017.

**RO.43.****Title EN**

**Artificial dental root and procedure for obtaining it from polylactic acid grafted with mesenchymal stem cells**

**Authors**

*Ilea Aranka<sup>1</sup>, Boşca Adina Bianca<sup>2</sup>, Soriţău Olga<sup>3</sup>, Guţiu Eugen<sup>4</sup>, Cămpian Radu Septimiu<sup>1</sup>*

<sup>1</sup> UMPH Cluj-Napoca, Faculty of Dentistry, Department of Oral Rehabilitation, Oral Health and Dental Office Management, Romania

**Institution**

<sup>2</sup> UMPH Cluj-Napoca, Faculty of Medicine, Department of Histology, Romania

<sup>3</sup> IOCN, Laboratory of Radiotherapy, Radiobiology and Tumor biology, Romania

<sup>4</sup> 3D Printing Consulting, Romania

**Patent no.**

Patent application No. **A 00135/27.02.2019**

The artificial dental root, according to the invention, consists of a porous scaffold made of polylactic acid (PLA) by 3D printing and then grafted with autologous mesenchymal stem cells derived from the adipose tissue (ADSCs) and pre-differentiated towards the bone lineage, which will subsequently produce the bone matrix.

The process for obtaining of artificial dental root grafted with mesenchymal stem cell consist of the following steps:

**1.** Making a porous dental root scaffold by 3D printing from PLA; **2.** Harvesting of adipose tissue; **3.** Isolation, cultivation, multiplication and characterization of ADSCs; **4.** Differentiation of ADSCs towards the bone lineage and evidence it (PKH26 mark); **5.** Cultivation of ADSCs pre-differentiated to the bone lineage on the PLA scaffold and implantation at the receptor situs level.

**Description EN****Applications. Advantages.**

By applying the invention, the following advantages will be achieved:

1. Preserving the dimensions of postextractional alveoli by implanting artificial dental roots in these sites.

2. Postoperative bone resorption is reduced.

3. The risk of rejection of the graft from the postextractional alveoli is reduced, due to the use of autologous mesenchymal stem cells harvested from the patient; moreover, the matrix used is biocompatible and is resorbable over time

3. Creating optimal local conditions for the insertion of future dental implants or for applying the prosthetic works.

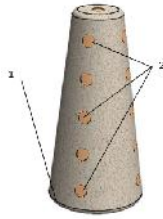


Figura 1

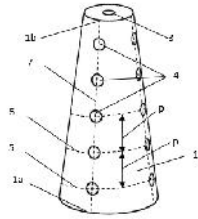


Figura 2

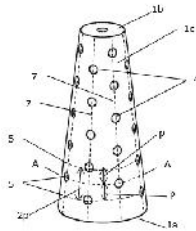


Figura 3

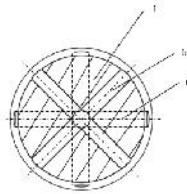
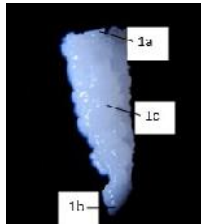


Figura 4



## University of Craiova

**RO.44.**
**Title EN**
**DEVICE USED FOR OSTEOSYNTHESIS AND  
COMPACTION OF LONG BONE FRACTURES**
**Authors**

Tarnita Daniela, Tarnita Danut-Nicolae

**Institution**
**University of Craiova & University of Medicine and  
Pharmacy, Craiova, Romania**
**Patent no.**

Patent application No. A00162/2019

The technical problem solved by the invention consists in making a mechanical assembly achieving superior stabilization of the fractures of the long bones diaphysis with simultaneous compaction in the fracture focal point. The device for the osteosynthesis and compaction of long bone fracture consists of two biocompatible metal collars, adjustable to the thickness and shape of the bone. These are made up of two halves of a cylinder that assemble at an edge by two clamps, and at the opposite edge, a screw tightens them.

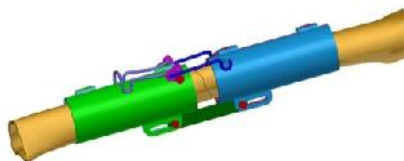
**Advantages:**

- ✚ very good adjustment to fractured bones due to the two necklaces that are made of two cylinder halves coupled together and screwed together;
- ✚ stabilization of potential fractures of the fracture fragments;
- ✚ ensuring a continuous compaction, which contributes to the healing of the fracture;
- ✚ providing a very good stabilization of the fracture area;
- ✚ the device is installed on small incisions without large blood loss and without the destruction of soft tissues;
- ✚ removal of the device after consolidation is accomplished without difficulty and without the destruction of bone tissue.

**Description  
EN**
**Applications:** Orthopedics, Trauma

**Class no.**

4



NATIONAL

RO.45.

Title EN	<b>CENTROEDULAR ELASTIC NAIL, MADE OF METALLIC SPHERES CENTERED ON A CENTRAL ROD, USED FOR OSTEOSYNTHESIS OF DIAPHYSEAL FRACTURES OF LONG BONES</b>
Authors	<b>Tarnita Danut-Nicolae Tarnita Daniela, Popa Dragos Laurentiu, Vaduva Razvan Cristian, Petrovici Ilaria Lorena, Tenovivi Mihai</b>
Institution	<b>University of Craiova, University of Medicine and Pharmacy, Craiova and Emergency Hospital Craiova, Romania</b>
Patent	Patent application No. A00233 /2019 The elastic centromedular nail made of metallic spheres centered on a central steel rod, used for osteosynthesis of long bone diaphyseal fractures is made of a biocompatible stainless steel central rod on which several metal spheres of stainless steel with diameter equal to the smallest diameter of the bone marrow can be introduced. At its head, the rod has a rounded cone that is screwed to the center rod of the centromedular nail. At the opposite end of the rod there is a threaded cylinder on the center brooch. This cylinder has a transverse slot for extracting the nail from the medullary channel after fracture healing.
Description EN	<b>Advantages:</b> - it is modular and adaptable to any type of diaphyseal fracture of long bones; - it ensures a good compaction of the fragments due to the lighter slippage of the two segments of the bone fracture, reducing or eliminating the risk of pseudarthrosis; - it prevents large movements between fracture bones in the fracture area due to the optimal adaptability of the metal spheres to the bone canal; - motion stability is ensured by continuous inter-fragmentation compression provided by muscle tonus and more easily ensured by metal spheres than by a rigid rod; - avoidance of significant degenerative-dystrophic lesions at the level of the contact surface in the fracture zone due to the elasticity of the stem.
Class	<b>Applications:</b> Orthopaedics, Trauma

4

**RO.46.****Title EN****AUTOMATIC, MODULAR ARCHITECTURE,  
WITH COOPERATIVE FACILITIES****Authors**

Dan Andrițoiu, Horațiu Roibu, Lidia Băzăvan, Daniela Tarniță, Nicu George Bîzdoacă

**Institution****University of Craiova, ROMANIA****Patent**

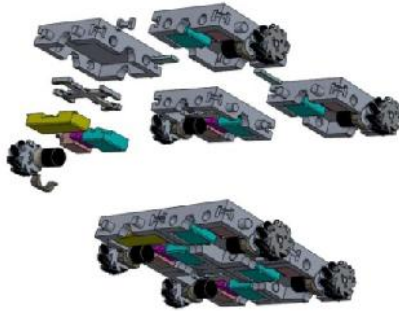
Patent application No. A/00174 / 2019

**Description  
EN**

The proposed modular architecture has cooperative facilities and it is characterized that configurable modules, which are coupled by means of the orifices, form it and the cylindrical connectors provided with the safety elements, respectively configurable elements thus achieving topological standardization, which leads to a reduced configuration time, even by people with less technical training. A second claimed priority it is characterized in that the capacity of the power supply can be modified depending on the number of configurable modules, the load carrying and the desired autonomy by means of the simple insertion of a battery into the spaces delimited by the bus in the mode cell. The batteries can be used alternately, can be charged on the platform or separately after they have been dismantled. The proposed architecture have implemented identification functions, self-diagnostics and hour counter functions to achieve correct predictive maintenance , and the replacement of defective or worn components is easily accomplished, which is automatically recognized and installed by the system through the plug and play functions integrated into each module type. The proposed architecture it is characterized in that the wireless communication module can communicate and cooperate with other robots in the operating space directly between them (to avoid accidental collisions) or through via a server and / or directly with a server, which processes the received information and sends vouchers to other automated, modular architectures with cooperative facilities to provide management at the branch / branch / company level.

**Class****Applications:** Industry 4.0, Automotive

8



**RO.47.**

**Title EN** SMART FLUID BASED SPHERICAL ARTICULATION

**Authors** Vladu Ionel Cristian, Pană Cristiana Floriana, Stoian Viorel, Pătrașcu Pană Daniela Maria, Vladu Ileana, Grecu Dan Cristian, Daniela Tarniță, Nicu George Bîzdoacă

**Institution** University of Craiova, ROMANIA

**Patent** Patent application No. A/00213 / 2019

The invention relates to a spherical joint (AS) with motion control based on intelligent fluids.

The intelligent fluid-based spherical joint according to the invention consists of two concentric semi spheres connected with two elements chord, each having a stop valve in order to control smart fluid and implicit the system movement

The intelligent fluid-based spherical joint controls the movement dynamics of the elements it interconnects, being designed for systems that incorporate pneumatic or spring-loaded drive systems.

**Description** The invention has the following advantages:

- EN**
- The new proposed joint can be easily adapted to any mechatronic system available on the market;
  - there is no significant increase in system complexity;
  - additional energy consumption is insignificant;
  - has superior performance with regard to the kinematic and dynamic control of the system in which it is integrated;
  - there is no significant increase in the mass of the mechatronic system by integrating these joints;
  - allows the cinematic and dynamic control of the interconnected elements, regardless of the drive system.

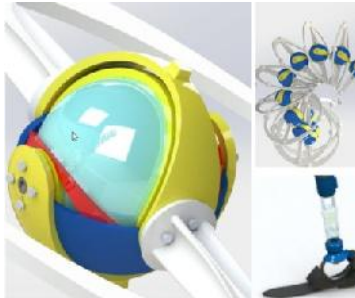
**Applications:** prostheses, hyper-redundant robots,

NATIONAL

manipulators and robotic arms.

Class

5

**RO.48.****Title EN****SMART FLUID BASED VARIABLE GEOMETRY WHEEL****Authors**

Pană Cristina Floriana, Vladu Ionel Cristian, Pătrașcu Pană Daniela Maria, Manta Liviu Florin, Cojocaru Dorian, Daniela Tarniță, Nicu George Bîzdoacă

**Institution Patent**

**University of Craiova, ROMANIA**  
Patent application No. A/00212 / 2019

**Description EN**

The invention relates to a smart wheel based intelligent wheel for mobile platforms equipped with a sensory obstacle detection system and a motion control unit adapted to any type of flat or rugged terrain, including climbing / lowering stairs.

The variable geometry wheel based on intelligent fluids according to the invention solves the above problem in that it is composed of several segments (slices, spokes) each having the possibility of controlled expansion or retraction by means of an assembly of four controllable hydraulic cylinders intelligent fluids, linear positioning, controlling the movement.

The invention provides the following advantages:

- the new proposed principle can be easily adapted to any wheeled mobile electric platform (and not only) available on the market;
- there is no significant increase in the mobile platform's mobile mass;
- high autonomy, because the additional energy consumption is insignificant (energy consumption required for rough

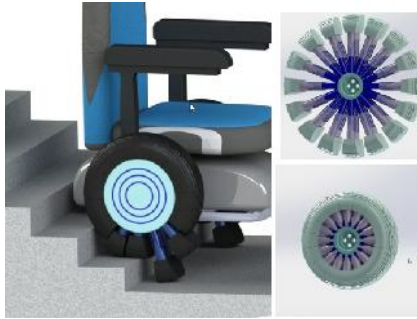


terrain or climbing stairs);  
 - has superior performance in ascending / descending speeds;  
 - stair climbing / descending is done automatically without requiring manual control or process adjustment;  
 - there is no discomfort created by the vertical balance, moving on the linear trajectory.

**Applications:** wheeled mobile platforms (electric wheelchair for motorbike, mobile robots, ninebot, etc.) that travel on rough terrain, including stairs.

**Class**

12



**RO.49.**

**Title EN**

**ANKLE DYNAMIC ORTHESIS**

**Authors**

STANIMIR Alexandru, RUSU Ligia, MARIN Mihnea, STANIMIR Octavian

**Institution**

UNIVERSITY OF CRAIOVA, Infrastructura de cercetare în științe aplicate (INCESA)

**Patent**

nr. 130150/2018

**Description**

**EN**

The dynamic orthesis for ankle allows to improve the gait rehabilitation after stroke, means assiste drop foot. The new of this orthesis consists in development a specific alezage system in active pistone, for assiste the air flow between the two rooms of the pistone. When the liniar speed has a prague, some resistants forces that are suplimentary and are propotional with foot movement. The economic and technic advantages mean low costs for fabrication, due of using standardized components, robustness and high reability. Alos it has functional advantages like : obtain the normal gait conditions for both legs, low heel attack by create a suplimentary force from active component. By this way it

NATIONAL

will decrease the risk of foot and ankle injuries.

**Class**

4,6



**RO.50.**

**Title EN**

**Gluten-free bread made from rice flour supplemented with chicory flour and locust bean powder and process for obtaining the same**

**Authors**

Nour Violeta, Ionică Mira Elena, Tuțulescu Felicia, Corbu Alexandru Radu, Hurezeanu Petru Bogdan Cristian

**Institution  
Patent**

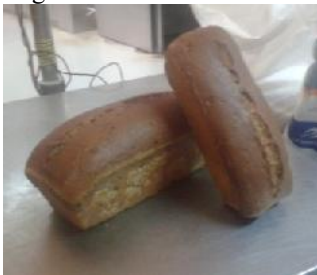
**University of Craiova, ISIS-PAN S.R.L.**  
Patent application No. A/00244/ 04.04.2018

**Description  
EN**

The invention relates to the recipe and the process for obtaining a gluten-free bread made from rice flour and potato starch, supplemented with chickpea flour and locust bean powder, using pectin and xanthan gum to improve dough consistency and gas retention capacity, esters of diacetyl tartaric acid with monoglycerides to improve dough resistance and to stabilize the gas cells and potassium tartrate with an acidic, emulsifying and stabilizing role. The product contains 6.34% protein, 4.26% lipids, 44.44% carbohydrates and 2.7% fiber and has an energy value of 240.66 kcal/100 g. The addition of chickpea flour and locust bean powder gives remarkable sensory properties to the product, which has special color, taste and flavor. The texture of the product is similar to that of a gluten-containing bread. The nutritional and functional superiority of the product in relation to a gluten-free bread made exclusively from rice flour and potato starch results mainly from the partial substitution of

potato starch with chickpea flour and locust bean powder. The product may have beneficial effects on health due to the lack of gluten, the high content of antioxidant compounds such as tannins, polyphenols and minerals and the high content of fiber.

**Class** 3. Agriculture and Food Industry




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**RO.51.**

**Title EN** Eggs high content in omega-3 polyunsaturated fatty acids and carotenoids and method of obtaining the same

**Authors** Nour Violeta, Panaite Tatiana Dumitra, Criste Rodica Diana, Olteanu Margareta, Ropotă Mariana, Vlaicu Petru-Alexandru, Corbu Alexandru Radu, Sărăcilă Mihaela

**Institution** University of Craiova, IBNA Balotesti, House Ana Tour SRL

**Patent** Patent application No. A00525 / 11/06/2018

**Description EN** The present invention relates to chicken eggs enriched with omega-3 fatty acids and carotenoids obtained by feeding the laying hens for 2-6 weeks with feed supplemented with flax seeds and dehydrated by-products from tomato processing (skins and seeds). The yolk of these eggs contains 3.5-5 mg/kg zeaxanthin, 3.2-4.2 mg/kg lutein, 0.9-1.3 mg/kg lycopene, 0.4-0.6 mg/kg trans- apo-carotenal, together with 5.0-5.2 g omega-3 fatty acids/100 g total fatty acids and an omega-6/omega-3 ratio of between 4 and 5 in the egg yolk fat. Adding tomato waste to the layers' diet resulted in a significant increase of the Roche colour score in correlation with the increased deposition of carotenoids in egg yolks. After four weeks of feeding, use of 7.5% tomato waste in the diet of laying hens increased the egg yolk lutein and zeaxanthin content by 62% and 39% respectively, compared

to the control group. Dietary supplementation with 5% dried tomato waste increased the oxidative stability of omega-3 PUFA enriched eggs.

The simultaneous supplementation of the hens diet with flaxseeds and dried tomato waste led to obtaining the so-called “designer eggs” that are high in essential omega-3 fatty acids and carotenoids.

**Class**

3. Agriculture and Food Industry

**RO.52.**

**Title EN**

**BIOCOMPOSITE PART AS GREEN-STATE AND MANUAL DEVICE TO MOLDING THE SAME**

**Authors**

TEISANU Alina Cristina, SIMA Gabriela, PISC Marian George, CIUREZU-GHERGHE Leonard Marius, GINGU Oana

**Institution**

**University of Craiova**

**Patent**

A/00759/27.09.2017

**Description**

**EN**

The invention relates to a biocomposite feedstock and to a manual device for forming it from mixtures of biocomposite powders used for the unique production of the biocompatible materials for bone reconstruction. The biocomposite feedstock consists of Ti6Al4V and hydroxyapatite powders and wax-based binders. The manual device for forming the biocomposite feedstock can be used in unique production, which is a specific requirement for the reconstruction of different bone defects, and allows the use of low and medium pressures for the injection of the raw material, simultaneously with low temperature application for softening of the binders.

**Class**

4



NATIONAL

## „Alexandru Ioan Cuza” University of Iasi

**RO.53.**
**Title EN**

**Interconnect: cycling for a better life. An android mobile app to connect owners of unused bicycles with people in need of a quick transport vehicle in the Iasi metropolitan region.**

**Authors**

**Andrei Ungureanu, Florin Alexandru Luca**

**Institution**

University Alexandru Ioan Cuza Iasi, Doctoral School of Economics and Business Administration  
Technical University Gheorghe Asachi Iasi

**Description  
EN**

Cycling for a better life as a concept consists of developing an android mobile application to connect owners of unused bicycles with people in need of a quick transport vehicle in the Iasi metropolitan region. As of December 2016, roughly 1000 cities worldwide have a bike-sharing program. Iasi is the fastest growing city in the North-Easter region of Romania with an urgent need to become an urban smart development. The questionnaire design was pre-tested and redesigned through personal interviews with young commuters aged 16 to 30 during a period of three months. The data collected creates an output in the form of an algorithm for an android mobile application with the purpose of smart bicycle sharing integration in Iasi metropolitan area. The constant need to solve the problem of heavy traffic and pollution is enhanced by the economic advantage of using the pre-tested concept. The purpose of this study is to reveal the importance of using a smart mobile system from a marketing perspective. Higher level of usage of the mobile application is more likely to trigger a favorable evaluation of Iasi by both its inhabitants and tourists. A mobile application successfully developed can directly create a marketing funnel between Iasi citizens, tourists and the local administration with positive economical and urban mobility implications.

**Class**

Innovative research



**RO.54.**

<b>Title EN</b>	<b>Statistical methods of analysis in volleyball (ProVBallStat 1.1)</b>
<b>Authors</b>	Stirbu Ilie-Catalin, Rohnean Adrian Ionel, Stirbu Catalina Mihaela
<b>Institution</b>	<b>University “Al. I. Cuza” Iasi, Technical University “Gh. Asachi” Iasi</b>
<b>Description EN</b>	By this application we try to facilitate the organization of some sports competitions. The application allows to introduce the competition system, the results and the ranking in real time. Thus, we are able to give the participants fair data and calculations of the rankings at any time
<b>Class no.</b>	13

**RO.55.**

<b>Title EN</b>	<b>Electronic application of organizing sport competitions</b>
<b>Authors</b>	Stirbu Ilie-Catalin, Rohnean Adrian Ionel, Stirbu Catalina Mihaela
<b>Institution</b>	<b>University “Al. I. Cuza” Iasi Technical University “Gh. Asachi” Iasi</b>
<b>Description EN</b>	<p>In modern sports winning is conditioned by giving the attention to every detail. From eating to rest, from physical training to tactical training, from correcting your own mistakes to capitalizing on those of your opponents and, last but not least, effectively capitalizing on team strengths.</p> <p>Thus, it is essential to correctly set these strengths and to timely correct errors in team play. That is why we can say that in modern sports, statistics are a must-do.</p> <p>Achieving correct and effective statistics is crucial to the success of a team. Therefore, the monitored and quantified parameters should be chosen carefully so that they are as representative as possible for both the team and the individual athletes, to include as many determinants as possible in sport performance.</p>
<b>Class no.</b>	13

## “Gheorghe Asachi” Technical University of Iasi

### RO.56.

<b>Title EN</b>	<b>Brain-Computer Interfaces to control neuroprostheses and robots</b>
<b>Authors</b>	Alexandru Mitocaru, Danut Irimia, Alina Baciu, Marian Poboroniuc
<b>Institution</b>	<b>GHEORGHE ASACHI Technical University of Iasi</b>
<b>Patent No.</b>	-
<b>Description EN</b>	Better outcomes in CVA, SCI, CP rehabilitation will be obtained while adopting hybrid FES & mechatronics devices as rehabilitative devices, as well as completed with brain-computer interfaces (BCI) systems. In BCI-based rehabilitation applications, users wear an EEG cap that monitors motor imagery that influences the feedback (e.g. triggered electrical stimulation over the forearm to perform fingers opening). The key element of this concept is the real-time connection between the brain activity and feedback. The project explores the new applications involving BCI in controlling neuroprostheses and mobile robots.

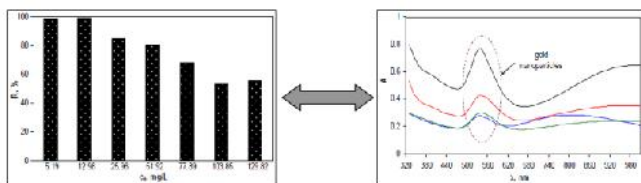
### RO.57.

<b>Title EN</b>	<b>Ecological recovery of gold ions from industrial wastewater</b>
<b>Authors</b>	Laura Bulgariu <sup>1</sup> , Mădălina Ghercă <sup>1</sup> , Alina Roxana Lucaci <sup>1</sup> , Anca Mihaela Mocanu <sup>2</sup> , Dumitru Bulgariu <sup>3,4</sup>
<b>Institution</b>	<sup>1</sup> „Gheorghe Asachi” Technical University of Iași, “Cristofor Simionescu” Faculty of Chemical Engineering and Environmental Protection, Department of Environmental Engineering and Management <sup>2</sup> „Gheorghe Asachi” Technical University of Iași, “Cristofor Simionescu” Faculty of Chemical Engineering and Environmental Protection, Organic, Biochemical Food Engineering Department <sup>3</sup> “A.I. Cuza University of Iasi, Faculty of Geography and Geology, Department of Geology <sup>4</sup> Romanian Academy, Filial of Iași, Branch of Geography
<b>Description EN</b>	This research describes a simple and ecological procedure for the recovery of gold ions from industrial wastewater. The procedure is based on the biosorption of gold ions on green algae biomass, followed by their selective reduction. Since the

main process of recovery procedure is a biosorption process and the biosorbent used is marine algae biomass, this procedure can be considered simple and ecological. The optimal experimental conditions for gold ions retention on green algae biomass are: initial solution pH 2.0, biomass dosage 2 g/L and room temperature ( $20 \pm 1^\circ\text{C}$ ). Under these conditions, the removal percent is high than 85 % for an initial concentration range of 0 – 30 mg Au(III)/L, and the contact time required for retention is lower than 20 min. All these important advantages suggest the possible utilization of such process for the recovery of gold ions from industrial wastewater. In addition, because the gold ions retention is followed by their reduction, the recovery of gold ions do not require desorption from exhausted marine algae biomass. The applicability of this recovery process of gold ions was tested using wastewater samples from a local printing circuit boards company. The quality characteristics of treated wastewater sample and some economic considerations, indicates the potential of this recovery process as a suitable and ecological alternative for industrial applications.

**Acknowledgement:** Financial support for the studies was provided by the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-III-P4-ID-PCE-2016-0500.

Class no.



RO.58.

Title EN

**New PET-based ion-exchangers for the retention of Cu(II) ions from aqueous media**

Authors

Anca Mihaela Mocanu<sup>1</sup>, Oana Ionela Ungureanu<sup>2</sup>, Marcela Zamfir<sup>3</sup>, Laura Bulgariu<sup>2</sup>

Institution

<sup>1</sup>„Gheorghe Asachi” Technical University of Iași, “Cristofor Simionescu” Faculty of Chemical Engineering and Environmental Protection, Organic, Biochemical Food Engineering Department

<sup>2</sup>„Gheorghe Asachi” Technical University of Iași, “Cristofor Simionescu” Faculty of Chemical Engineering and

NATIONAL



**Environmental Protection, Department of Environmental Engineering and Management**

**<sup>3</sup> GreenFiber International Company, Iasi**

The use of PET for packaging has led to the disposal of large quantities of PET waste in the environment, which has caused a serious pollution problem. In addition, since the degradation of PET waste takes a long time (over 180 years), environmental pollution with this kind of waste can be considered a permanent one. Therefore, recycling of PET waste is the only solution to reduce environmental pollution with this type of waste, but this alternative will only be applied when the recycling process is economically sustainable.

Starting from these observations, in this research PET waste was functionalized with phenol and used as ion exchanger for the removal of Cu(II) ions from aqueous media. The experiments were performed in batch systems as a function of amount of phenol used for ion exchanger preparation and initial Cu(II) ions concentration. The experimental results have indicate that a mixing ration of 2 g of phenol : 1 g of PET waste is the optimum value to obtain the most efficient ion exchanger. The maximum ion exchange capacity ( $q = 7.56 \text{ mg Cu(II)/g}$ ) of PET-based ion exchanger was evaluated using Langmuir isotherm model, and compared with the values obtained for several “traditional” ion exchangers. The experimental results indicate the possible use of PET waste for the preparation of low cost ion exchanger to remove heavy metal ions from aqueous media, which will allow a new possibility to use this waste and make its recycling more attractive from economically.

**Description**  
**EN**

**Acknowledgement:** Financial support for the studies was provided by the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-III-P4-ID-PCE-2016-0500.

**Class no.**

9



**RO.59.**

**Title EN** **Cam type chuck - self-centering pneumatic actuated fixture**  
**Authors** CHITARIU Dragoș-Florin, BOCANEȚ Ana-Maria,  
 MUNTEANU Adriana

**Institution** **Gheorghe Asachi Technical University of Iași**

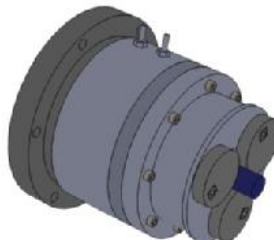
**Patent** Patent application No. 5204/21.06.2018

**Description**  
**EN**

The mandrel uses a series of cams for simultaneous centering and clamping of the workpiece. The cams rotate under the action of three shafts. Shafts that present a spiral groove in which follower are inserted resulting a spatial cam. The shafts are rotated by an hollow acting rod. The acting rod is jointed to an pneumatic cylinder rod. The pneumatic cylinder is attached to the mandrel body. The pneumatic cylinder is attached to the machine main shaft by a flange. The pneumatic cylinder uses a rotary sleeve for air feed. The 3 cams rotate simultaneous and center and clamp the workpiece under the action or the action of the pneumatic cylinder rod. The 3 cams can be easily removed and replaced after easily replaced after they were worn out resolving the problem of the cumbersome replacement of classical jaws.

**Class no.**

Invention Classification 5



OPTIONAL

**RO.60.**

**Title EN** **Nozzle system used for thermal spraying in electric arc**  
**Authors** TOMA Ștefan Lucian, SAVIN Gabi, TOMA Bogdan Florin,  
 BEJINARIU Costica, IONIȚĂ Iulian, VIZUREANU Petrică,  
 BĂDĂRĂU Gheorghe, SANDU Andrei Victor, CAZAC Alin,  
 BURDUHOS – NERGIȘ Diana – Petronela

**Institution** **Gheorghe Asachi Technical University of Iași**

**Patent** **Application A/01133/21.12.2018**

**Description**  
**EN**

The invention belongs to the field of Thermal spraying in electric arc of wire drawn metallic materials. The technical problem that is solved by the invention is the directed constrain

NATIONAL

of the electric arc without modifying the velocity and the flow of the compressed air that divides the droplets of molten metal into fine particles in order to increase the temperature and the velocity of the sprayed particles. The technical solution to solve this problem consists in the creating a compressed air circuit through a concentric nozzle system composed of a body, a cap, a conical nozzle, a conical nozzle and a constraint frontal nozzle.

**Class no.**

5

**RO.61.**

**Title EN**

**Ecologic geopolimer based on thermoelectric powerplant ash and glass powder from recycled wastes for applications in the field of buildings materials and procedure of obtaining it**

**Authors**

BURDUHOS NERGIŞ Dumitru Doru, VIZUREANU Petrică, CORBU Ofelia-Cornelia, ABDULLAH Mohd Mustafa Al Bakri, SANDU Victor-Andrei

**Institution  
Patent**

**Gheorghe Asachi Technical University of Iaşi  
Application A/00038/25.01.2019**

**Description  
EN**

The invention refer to an ecologic geopolimer based on thermoelectric powerplant ash and glass powder from recycled wastes for applications in the field of constructions and procedure of obtaining it, which is activated alkaline with a solution of sodium silicate and hydroxide, by geopolimerisation. The obtained material is obtained from a mixture of ash from a powerplant (36±1%), glass powder (15±1%), alkaline activated with a solution of sodium silicate (28±1%) and sodium hydroxide 10M (20±1%), and poured in a mold, vibrated and than dried at room temperature for minimum 24h. The resulted material has an original chemical composition and is used for application in the field of building materials: facades, screeds, bricks, refractory insulation, etc.

**RO.62.**

**Title EN**

**Dynamic Artificial halochamber with autoregulation and multiple uses**

**Authors**

SANDU Ioan Gabriel, SANDU Ion, SANDU Andrei-Victor, EARAR Kamel, VASILACHE Viorica, ŞTIRBU Cătălina – Mihaela, CRIŞAN DABIJA Radu Adrian, CHIRAZI Marin, VLĂDESCU Alina, COTRUŢ Mihai Cosmin

**Institution  
Patent**

**Gheorghe Asachi Technical University of Iaşi  
Application A00798, 12.10.2018**

NATIONAL

**Description**  
EN

The invention relates to a dynamic, autoregulating and multiple use artificial halochamber which allows the generation of saline aerosols for the prevention and treatment of cardio-respiratory and osteo-muscular, psychomotor disorders, as well as for improving the physical performance of children, the elderly and people working in high-stress and athletes performance.

**Class no.** 4

**RO.63.****Title EN****Hydromassage jacuzzi system with hydro / aeromassage and salt aerosols halochamber****Authors**

SANDU Ioan Gabriel, SANDU Ion, EARAR Kamel, SANDU Andrei-Victor, VASILACHE Viorica, ȘTIRBU Cătălina – Mihaela, CRIȘAN DABIJA Radu Adrian, CHIRAZI Marin, VLĂDESCU Alina, COTRUȚ Mihai Cosmin, VRÂNCEANU Maria Diana

**Institution  
Patent****Gheorghe Asachi Technical University of Iași  
Application A00799, 12.10.2018****Description**  
EN

Hydromassage jacuzzi system with hydro / aeromassage and salt aerosols halochamber used in the prevention and treatment of cardio-respiratory, osteo-muscular, neuro-motor disorders, as well as in improving the physical performance of children, elderly people, high-pressure workers and performance athletes.

**Class no.** 4**RO.64.****Title EN****Eco-tents****Authors**

Neculai Oana, Bodescu Liliana

**Institution****Technical University “Gheorghe Asachi” of Iasi****Patent**

in progress

**Description**  
EN

Because camping gear is frail, not providing much protection from harsh weather conditions like heavy winds and storms, the need for a sturdy, cheap to make, portable shelter appeared, a shelter that one can just fold up, throw in the back seat of your car and not worry about bad weather on a camping trip. This design for a temporary, portable shelter could even be used to offer homeless people protection from the weather due to the cheap materials used to create it. By using the Morphological matrix of ideal, the 3D criteria method, taking into account these three criteria: building materials, structural base and folding method, we have reached two solutions for a cylindrical hut composed from recycled plastic/ rubber, a cheap material that, when recycled, reduces the amount of pollution caused by its improper disposal, and PVC pipes as framework and hinges.

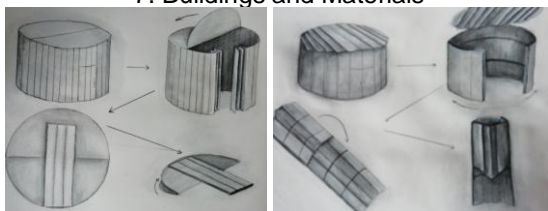
The first option involves multiple straight pieces of plastic combined by makeshift hinges made out of PVC pipes of different diameters, the smaller ones having a notch all around its cross

section every 15 to 20 cm apart, in order to allow space for several plastic balls, creating a bearing in order to reduce friction. These hinges will allow the walls to fold up into a compact plastic pile that can be easily reassembled into its shelter form.

The second option involves the multiple sheets composing the walls to be curved and the ones composing the roof to be slightly slanted in such a way that, instead of folding onto one another, they would slide one over the other with small PVC pipe cuts as rolls that would allow the walls to slide over each other and lock into each other, once set up for camping.

Class

## 7. Buildings and Materials



RO.65.

Title EN

Authors

Institution

### HyperBridge

Neculai Oana, Crişmariu Bogdan, Lăcătuş Valentin  
**Technical University “Gheorghe Asachi” of Iasi**

The HyperBridge concept brings innovation by its design, functionality and its timber hyperboloid structure.

The project refers to cross-over a river, connecting two decks with recreation facilities, like summer theater, open cinema, resting area, terrace and sports.

The bridge has 45 meters and across the two decks has 65 meters. The used area is about 1600 square meters. The main structural system is the hyperboloid which crosses the river and adjacent are two symmetrical arches that sustain the two decks and sits on the same foundations as the hyperboloid. The two structural elements, hyperboloid and arches, are made of glue laminated timber, which requires industrial manufacture with high precision and specific treatments for timber to endure the environment.

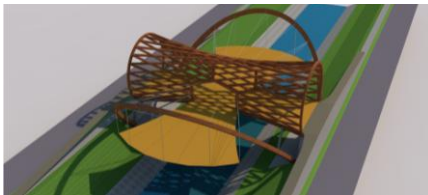
Description  
 EN

The hyperboloid has 508 elements which are fastened with the help of rigid connections made of steel and bolts. The length of the elements varies between 3.5 and 6 meters, therefore it has a very short building time, and damaged members are easily replaced.

The imposing dimensions, the aesthetical design offered by the HyperBridge, texture of the materials, fulfils the functionality, comfort and recreational purposes.

Class no.

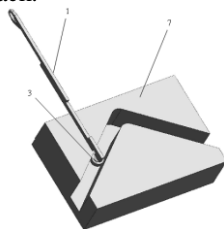
7

**RO.66.****Title EN****Authors****Institution****Knitting Needle for Weft Knitting Machines****Blaga M., Seghedin N.E., Chitariu D****”Gheorghe Asachi” Technical University of Iasi, Romania****RO128838-A2**

The invention describes a needle, designed for automatic electronic flat knitting machines, built up with the purpose of reducing the initial impact friction force, between needle but and knitting cam profile. It is expected through the proposed technical solution, to reduce the number of broken needle buts and consequently the costs related to the needles, which is not neglectable at the high speed electronic knitting machines.

**Description****EN**

According to the invention, the needle comprises of the main body, which has on the lower part a cilindric part, on which is placed a roll. The novelty of the invention is related to the roll, which is replacing the classical needle but and ensures its movement up and down inside the cam track.

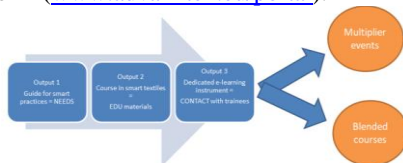
**RO.67.****Title EN****Authors****Institution****Smart textiles for STEM training****Blaga M., Cristian I., Piroi C., Harpa, R, Fărîmă D.****”Gheorghe Asachi” Technical University of Iasi, Romania****RO01-KA202-049110**

The Erasmus+ project “**Smart textiles for STEM training**”–Skills4Smartex is funded with support from the European Commission. This project is a Strategic partnership in the field of transfer of innovation from research providers towards textile enterprises & VET schools. The quality of Vocational Education and Training (VET) in technical fields at European level means a competitiveness leverage in the international context. Speed-up of technological development is a challenge for the young VET students, while the labor market in STEM (Science, Technology, Engineering, and Mathematics) fields needs appropriate skilled

**Description****EN**

NATIONAL

professional workers, in order to compete on the global market. In this context, Skills4Smartex aims to improve the knowledge, skills and employability of STEM students in the fields related to STEM by providing appropriate training tools to understand multidisciplinary work through smart textiles. This goal will be achieved by means of practical work in constructing smart textile prototypes and through specialized courses hosted by a dedicated e-learning platform ([www.advan2tex.eu/portal](http://www.advan2tex.eu/portal)).



Ro.67a

Title EN

Authors

Institution

Description  
EN

### Formulation and evaluation of hydrophobic ointment for the treatment of trophic injuries

Iosif KOSZEGHI<sup>1</sup>, Ana Simona BARNĂ<sup>2</sup>, Gabriela CIOBANU<sup>2</sup>, Constantin LUCA<sup>2</sup>, Maricel DANU<sup>2,3</sup>, Constanța IBĂNESCU<sup>2,3</sup>

**1** Emergency County Hospital Piatra Neamț, Piatra Neamț, România

**2** "Gheorghe Asachi" Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection, Iași, România

**3** "Petru Poni" Institute of Macromolecular Chemistry Iasi, România

The main purpose of this study is to develop an ointment suitable for the treatment of trophic injuries from the chronic venous insufficiency, such as trophic ulcers.

The ointment was prepared following the triturating method. We used anhydrous lanolin, coconut butter and candelilla wax as absorption base to serve as a vehicle for the pharmaceutical active complex: insulin, neomycin, anesthesine, retinol and *Lavandula angustifolia* essential oil. The prepared pharmaceutical active complex shall be delivered on subcutaneous cellular tissue via topical application of semisolid formulation. We evaluated the semisolid formulation for physicochemical properties (physical appearance, color, texture, homogeneity, phase separation, pH, rheological properties) and microbial contamination.

The results of the rotational and oscillatory rheological studies can help assess the performance and processability of the product and to predict the long-term product stability and shelf life. Ointment was found to be stable and exhibited suitable rheological characteristics and have a homogenous texture with no signs of phase separation.

Evaluation of microbial contamination was investigated by detection of gram-positive bacteria - *Staphylococcus aureus*, gram-negative bacteria - *Pseudomonas aeruginosa*, *Escherichia coli* and yeast *Candida albicans*. The results of microbial contamination indicate absence of these specific microorganisms.

## Consortium Projects

**RO.68.**

**Title EN**

**Biodegradable Mg-Based Alloys for Orthopedic Implants - ORTOMAG**

**Authors**

Munteanu Corneliu<sup>1</sup>, Antoniac Iulian<sup>2</sup>, Vlad Daniela Maria<sup>3</sup>, Şindilar Eusebiu<sup>4</sup>, Savin Adriana<sup>5</sup>

<sup>1</sup>"Gh. Asachi" Technical University of Iasi – Project director

<sup>2</sup>University Politehnica of Bucharest – Partner Responsible

<sup>3</sup>"Grigore T. Popa" University of Medicine and Pharmacy – Partner Responsible

**Institution**

<sup>4</sup> University of Agricultural Sciences and Veterinary Medicine "Ion Ionescu de la Brad" – Partner Responsible

<sup>5</sup> National Institute of Research & Development for Technical Physics – Partner Responsible

**Project**

**Component Project 1 - 60 PCCDI / 2018 – MedicalMetMat**

The project has as main objective the development of new biodegradable materials from Mg-Ca-Zr, Mg-Ca-Y, Mg-Ca-Mn, Mg-Ca-Gd systems with applications in medical implantology.

Objectives: - Design, production and testing of biodegradable alloys from Mg-Ca-Zr, Mg-Ca-Y, Mg-Ca-Mn, Mg-Ca-Gd systems with applications in medical implantology; - employment 3 young full-time researchers (TUIASI, USAMV and INCDFI-IFT IAŞI); - in vitro and in vivo biocompatibility testing on animal models for the classification of alloys used as biodegradable materials usable in medical implantology; - supporting the technological transfer of the results obtained at regional and national level to the economic and medical environment in Romania; the identification of an optimal complex formula consisting of all six elements as an ideal material for orthopedic implants.

**Description EN**

ALIAJE BIODEGRADABILE PE BAZA DE MAGNEZIU  
PENTRU IMPLANTURI ORTOPEDICE

Project Component 1



**ORTOMAG**

Coordonator - TUIASI  
Prof. Univ. Dr. Ing.  
Corneliu Munteanu

NATIONAL



**RO.69.**

**Title EN**

**Ti-based biocompatible alloys for medical prostheses from complex micro-alloyed systems –BioTIT**

**Authors**

Vizureanu Petrica<sup>1</sup>, Geanta Victoras<sup>2</sup>, Savin Adriana<sup>3</sup>, Verestiuc Liliana<sup>4</sup>, Spataru Mihaela<sup>5</sup>

<sup>1</sup>”Gh. Asachi” Technical University of Iasi – Project director

<sup>2</sup> University Politehnica of Bucharest – Partner Responsible

<sup>3</sup> National Institute of Research & Development for Technical Physics – Partner Responsible

**Institution**

<sup>4</sup>”Grigore T. Popa” University of Medicine and Pharmacy– Partner Responsible

<sup>5</sup> University of Agricultural Sciences and Veterinary Medicine ”Ion Ionescu de la Brad” – Partner Responsible

**Project**

**Component Project 2 - 60 PCCDI / 2018 – MedicalMetMat**

The project has as main objective design, obtaining and testing of Ti-Mo-Si system alloys, with the the purpose of promoting a new generation of titanium alloys with applications in medical implantology.

**Description EN**

Objectives: Designing, obtaining and testing of Ti-Mo-Si alloys for medical applications; Employment two young full-time researchers (TUIASI and INCDFT-IFT IAȘI); In vitro biocompatibility study, implantation, osteointegration study and resorption rate on animal experimental model; Testing and full characterization of biomaterials obtained for patenting; Dissemination of results, attracting interest of implant manufacturers to create medical devices from the new alloy system.

ALIAJE BIOCOMPATIBILE PE BAZĂ DE TITAN PENTRU  
PROTETICA MEDICALĂ DIN SISTEME COMPLEXE MICROALIIATE

Proiect Component 2



**BioTIT**

Coordonator: TUIASI  
Prof. Univ. Dr. Ing.  
Petrica Vizureanu

**RO.70.**

<b>Title EN</b>	<b>Biocompatible alloys with high entropy for medical applications - HEAMED</b>
<b>Authors</b>	Geantă Victor <sup>1</sup> , Voiculescu Ionelia <sup>1</sup> , Ștefănoiu Radu <sup>1</sup> , Sandu Andrei Victor <sup>2</sup> , Vlădescu Alina <sup>3</sup> , Codescu Mirela <sup>4</sup> , Pavel Geta <sup>5</sup> , Kelemen Hajnal <sup>6</sup>
<b>Institution</b>	<sup>1</sup> POLITEHNICA University of Bucharest <sup>2</sup> "Gh. Asachi" Technical University of Iasi <sup>3</sup> National Institute for Research and Development in Optoelectronics INOE 2000 <sup>4</sup> National Institute for R&D in Electrical Engineering ICPE-CA <sup>5</sup> The University of Agricultural Sciences and Veterinary Medicine Iași <sup>6</sup> University of Medicine, Pharmacy, Science and Technology of Targu Mures
<b>Project</b>	<b>Component Project 4 - 60 PCCDI / 2018 – MedicalMetMat</b> The project has as main objective to obtain biocompatible high entropy alloys from the CrFeMoNbTaTiZr system used for medical applications as well as the surface functionalisation technology by inoculating hydroxyapatite doped with Ag, Cu or Zn in order to increase the capacity for osseointegration. The design of the alloy recipes was based on the choice of chemical elements with extremely low biotoxicity. They are currently used as a basis for alloying of classical alloys used in medical device manufacturing.
<b>Description EN</b>	

ALIAJE BIOCOMPATIBILE CU ENTROPIE RIDICATĂ  
UTILIZATE ÎN APLICAȚII MEDICALE

Proiect Component 4



**HEAMED**

Coordonator - UPB  
Prof. Univ. Dr. Ing.  
Victorag Geantă

**RO.71.****Title EN****Increase of biocompatibility and osteointegration of metallic implants through coatings and aerosol systems - SOLION****Authors**Sandu Ioan Gabriel<sup>1</sup>, Mihaescu Traian<sup>2</sup>, Sandu Ion<sup>3</sup>, Earar Kamel<sup>4</sup>, Cotrut Cosmin<sup>5</sup>, Vladescu Alina<sup>6</sup><sup>1</sup> "Gh. Asachi" Technical University of Iasi – Project director<sup>2</sup> "Grigore T. Popa" University of Medicine and Pharmacy– Partner Responsible<sup>3</sup> "Al. I. Cuza" University of Iasi – Partner Responsible**Institution**<sup>4</sup> "Dunarea de Jos" University of Galati– Partner Responsible<sup>5</sup> University Politehnica of Bucharest – Partner Responsible<sup>6</sup> National Institute for Research and Development in Optoelectronics – Partner Responsible**Project****Component Project 5 - 60 PCCDI / 2018 – MedicalMetMat**

The project has as main objective the study of saline aerosols and the increase of biocompatibility and osteointegration of metallic implants on which various depositions of nanostructures

Objectives: - the study of saline aerosols, the increase of biocompatibility and osteointegration of metallic implants on which various depositions of nanostructures with continuous, uniform and cross-linked nanostructures, obtained by various methods (immersion, chemical interaction, electrodeposition, cathodic arc evaporation) , carbon nanocomposites (binary, ternary or quaternary carbon based nanocomposites), osteoconductive (Ag) and / or Mg-doped osteoconductive hydroxyapatite (HAp) layers by electrochemical techniques with chitosan, fibrin, collagen and serine, as such or chemically modified.

**Description EN**

CREȘTEREA BIOCOMPATIBILITĂȚII ȘI A OSTEINTEGRĂRII  
IMPLANTURILOR METALICE PRIN ACOPERIRI ȘI SISTEME DE AEROSOLI

Proiect Component 5



SOLION

**„Grigore T. Popa” University of  
Medicine and Pharmacy Iași**

**RO.72.**

**Title EN**

**Medical device designed to relieve pain caused by colic in the newborn**

**Authors**

Luca Cătălina, Datcu Mădălina, Corciovă Călin, Fuior Robert

**Institution**

**University of Medicine and Pharmacy GRIGORE T. POPA Iasi**

**Description  
EN**

In medicine, a cramp-like pain that occurs from an empty organ (such as the uterus or intestine) is called "colic". The exact cause of colics in the newborn is not known, but studies show that the main cause is gastrointestinal. Most infants have an underlying condition such as postprandial ballooning through a poorly swallowed air in the meals, immature digestive tract, gastroesophageal reflux or some intolerance.

Due to the fact that most parents are confronted with this problem and the incidence of colic in premature or term newborn is 10-30%, it has become necessary to make an ideal device for the improvement of colic in newborns based on the thermal effect.

We used the EeonTex NW170-PI-20 high-conductivity wool that heats up when a voltage is applied. It has the entire conductive surface and retains its properties even if it is cut or punctured. S

o we have succeeded in designing an innovative device with the intention of using it to improve the colic in newborns, which are based on the thermal effect. This system is easy to use by parents at home and does not require medical knowledge. At present, there is no medical device specially designed to improve colic in newborn babies.

**Class**

4



**RO.73.****Title EN**

**The implementation of thermographic technique in early detection of prematurity apnea**

**Authors**

Luca Cătălina

**Institution**

**University of Medicine and Pharmacy GRIGORE T. POPA Iasi**

In this study, thermographic images of 100 newborns were performed under different thermal load conditions, with a mean gestation age of 31 weeks. All patients were hospitalized immediately after birth in the NICU Department, Cuza Voda Clinical Obstetrics and Gynecology Hospital in Iasi.

Infrared (IR) real time thermograms were collected using the OPTRIS PI160 IR medical camera. The IR camera was positioned at a predetermined distance from the patient, varying between 50 cm and 100 cm, depending on the recording conditions.

**Description****EN**

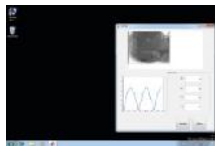
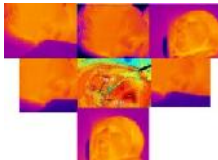
In our study, for the validation of the respiratory rate monitoring method using IR thermography, we have used a new system of respiratory rate monitoring in neonates. By putting the two monitoring systems in parallel, there was a delay between the recording of the respiratory rate with a monitoring system and the IR thermography system proposed by us. However, this delay did not result in false results, because by setting the mean after a certain time or 5 minutes, the respiratory rate recorded with the two systems is identical.

The results presented in this study indicate that IR thermography can be included in future ways of monitoring newborns.

We believe that this method can be an effective quantitative technique to measure symmetric nasal flow pattern in premature infants. This can provide information on the depth and frequency of each breathing cycle in order to get an early sign of changes in the child's behavior and to use this technique to assess the apnea of prematurity.

**Class**

4



**RO.74.**

<b>Title EN</b>	<b>A Team Based Learning Approach for instructing Medical Students on Complex Cervical Trauma Management</b>
<b>Authors</b>	Ioan Adrian Ciureanu, Anisia-Iuliana Alexa, Daniel Schwarz, Florentina Severin
<b>Institution</b>	<b>Grigore T. Popa University of Medicine and Pharmacy, Iași</b>
<b>Description EN</b>	<p>Complex cervical trauma is an important component of the otorhinolaryngologic pathology, with a rising incidence, representing 10% of all traumas, and a mortality rate of 3-6%. Clinical presentation methods are many; evolution is variable and involves conducting a multidisciplinary therapeutic management. The neck region is characterized by a high density of vital organs located in an unprotected anatomical region, making it one of the most vulnerable areas of the body for all kinds of lesions.</p> <p>For the first time we used in the class a new method which foster team involvement and enhance student learning. Team Based Learning increase knowledge, include better engagement in learning, deeper understanding of concepts and prepare the students for teamwork. Using this method they will briefly review pertinent clinical anatomy, create treatment goals for a patient, evaluate patient history and physical examination findings and recommend a specific treatment for a patient that includes lifestyle changes, nonpharmacologic therapy and pharmacologic therapy.</p> <p>The use of TBL is an effective way to review the content of a course in an applied and mimic real life situation, where students apply and develop their critical thinking skills in a safe environment.</p> <p>In the end, the students will gain a deeper understanding of the aero-digestive trauma commonly seen in emergency medicine clinical practice.</p>
<b>Class</b>	4

**RO.75.****Title EN****Smart Wearable SpO<sub>2</sub> NICU Monitor: P-SOCK****Authors**

Datcu Mădălina, Luca Cătălina, Corciovă Călin, Fuior Robert

**Institution****University of Medicine and Pharmacy GRIGORE T. POPA Iasi****Description  
EN**

Pulse-oximetry is a method to measure oxygen saturation of blood (SaO<sub>2</sub>) and heart rate (HR). We have been able to design and implement a neonatal pulse-oximeter in an innovative form, easy to use in Neonatal Intensive Care Units at an affordable price.

For premature newborns the oxygen saturation decreases in case of respiratory insufficiency due to insufficient development of the lungs, associated with respiratory pathology and heart failure.

This is the reason why has occurred the need to develop a wireless device that measure pulse-oximetry and heart rate and also has a large display which shows the values and alarms if these are out of limits, called P-SOCK.

P-SOCK is an redesigned pulse-oximeter sock-shaped, that has two components (modules).

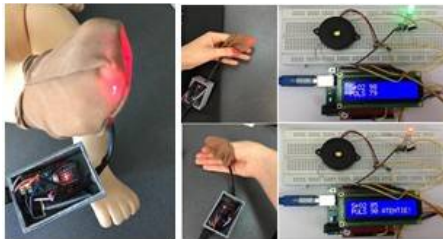
System innovation is also represented by its form. To get the perfect contact between the MAX30100 sensor and the newborn foot, was made a sock of special material that was taken from compression stockings. They are elastic and rigid at the same time, to avoid sensor movement on the foot. This material do not produce irritation and let the skin breathe. Material composition: 25% elastane (EL) and 75% polyamide (PA).

The results obtained from the P-SOCK pulse-oximetry test have shown that this method complies with all medical standards on patient safety and may be a convenient alternative for continuous monitoring of SpO<sub>2</sub> and heart rate.

This is a huge benefit for hospitals as well as accessibility to new techniques for premature newborns monitoring.

**Class**

4



RO.76.

<b>Title EN</b>	<b>The impact of GDPR on the activity of healthcare providers in Romania. Protection of patients' rights by professional secrecy.</b>
<b>Authors</b>	Ștefan Roșca, Ramona Oana Gunache, Florentina Severin, Anisia-Iuliana Alexa, Ioan Adrian Ciureanu
<b>Institution</b>	<b>Grigore T. Popa University of Medicine and Pharmacy</b> In accordance with the Charter of Fundamental Rights of the European Union, everyone has the right to respect for her / his private and family life. There are also a number of European and national laws that apply these fundamental rights, detailing specific obligations when processing personal data. The interpretation and application of some of these obligations by doctors is not always simple, especially since a balance must be struck between the legitimate interest of the operator and the requirements for the protection of personal data provided. Primary processing of patient data in a hospital is required to protect the patient's vital interests and to provide health care. The legitimacy of such processing has a legal basis and is generally not based on consent.
<b>Description EN</b>	However, there are specific situations where consent is required, especially when transferring personal data to recipients who are not related to the provision of health care or social assistance. Medical staff must ensure that the use of records for all clinical and non-clinical purposes is done in compliance with patients' rights. A survey questionnaire was created and administered online. The research population includes 1238 doctors and nurses from East of Romania. The results obtained show the correlation between level of education and the way patients are approached. Our results could bring new data to improve public health policies and implicitly to reduce patients' dissatisfaction and the risk for unauthorized disclosure or access to personal data.
<b>Class</b>	4



**RO.77.****Title EN****Using shape memory effect to obtain a new polymer for the manufacture of complete dentures****Authors**

Bolat Maria, Ciocan-Pendefunda Arina, Surlari Zenaida\*, Bida Cosmin, Balcos Carina, Baciú Raluca, Bosinceanu Dana-Gabriela

**Institution**

Grigore T. Popa University of Medicine and Pharmacy of Iasi, Faculty of Dental Medicine

**Description EN**

Currently, polymeric materials represent a very important place in all areas of human activity, taking part more and more in life, day by day. Of these, synthetic polymeric biomaterials - simple or composite - constitute a very trendy topic and with a great dynamic, given to the diversity of their use in medical and pharmaceutical fields. **Aim:** In this respect the study aims improving the quality of acrylates used for removable dentures, by incorporating vitamin B12 into the structure of acrylic polymer for the treatment of the oral aphthae, as well as for prophylactic purpose. Structural characteristics of researched polymer indicates that a large number of factors that contribute to complex sites with affinity for the template does exist.

**Class**

4

**RO.78.****Title EN****Dental Impression Techniques Assessment: Patients' Rating and Perceptions****Authors**

Bolat Maria, Dan-Nicoale Bosinceanu, Ciocan-Pendefunda Arina\*, Bida Cosmin, Balcos Carina, Bosinceanu Dana-Gabriela

**Institution**

Grigore T. Popa University of Medicine and Pharmacy of Iasi, Faculty of Dental Medicine

**Description EN**

Dental impression in dentistry is used for many purposes. One of these is to make a model that allows the study of fine details outside the oral cavity, which is sometimes impossible to achieve by direct prosthetic field inspection. Through the study, we aim to highlight the importance of the patient's understanding and availability of the prosthetic field impression techniques. Following the study, we noticed a major tendency for patients to benefit from the most advanced techniques and technologies that provide both a beneficial and easy-to-treat treatment, thus enhancing the comfort and perceptiveness of the dental work that follows be applied.

**Class no.**

4

**RO.79.**

<b>Title EN</b>	<b>Tmj Signs and Simptoms in Elderly Patients – A Clinical Study</b>
<b>Authors</b>	Bolat Maria, Ciocan-Pendefunda Arina, Surlari Zenaida*, Bida Cosmin, Balcos Carina, Baciuc Raluca, Bosinceanu Dana-Gabriela
<b>Institution</b>	Grigore T. Popa University of Medicine and Pharmacy of Iasi, Faculty of Dental Medicine
<b>Description EN</b>	TMJ along with muscles of stomatognathic system, as well as with occlusal anterior determinant, is a morpho functional complex and any morphological change of TMJ influence the conduct and efficiency of the entire stomatognathic system functions. To this purpose during the year of 2018 we investigated using clinical and laboratory tests for the morphological changes for each individual TMJ. In temporomandibular joint changes due to senescence cannot be separated from those caused by stomatognathic system dysfunctions encountered lifelong, changes that involve over time irreversible dysfunctional changes of the anatomic substrate of all TMJ structures.
<b>Class no.</b>	4

**RO.80.**

<b>Title EN</b>	<b>Choroidal vascular status – the role of binarization on optical coherence tomography images</b>
<b>Authors</b>	Otilia Obadă, Chiseliță Dorin
<b>Institution</b>	<i>Gr.T.Popa University of Medicine and Pharmacy, Iași Sfântul Spiridon Emergency Clinical Hospital, Iași</i>
<b>Description EN</b>	The choroid is an intensely vascularized layer. The impact of systemic vascular diseases on ocular function could be studied easily in clinical settings by means of binarization techniques. We evaluated the subfoveal choroidal layer using binarization applied on optical coherence tomography (OCT) images from 24 eyes with diabetes and 24 nondiabetic eyes. OCT line scans centered on the fovea were used and the region of interest (ROI) selected was the choroidal area under a 1.5 mm line centered on the foveal depression. After marking the ROI we applied Niblack binarization method. The choroidal vascular parameters

represented by total choroidal area (TCA), luminal area (LA), stromal area (SA) and choroidal vascularity index (CVI) were measured. The correlation between choroidal vascular parameters and the diabetic status, glycemic control and arterial hypertension status were underlined. SA was higher in patients with diabetes and diabetic retinopathy ( $0,47 \text{ mm}^2$ ), compared with nondiabetic patients ( $0,39 \text{ mm}^2$ ) ( $p = 0.07$ ). CVI was lower in patients with diabetes and diabetic retinopathy (65%) than in nondiabetic patients (68%) ( $p=0,11$ ). Choroidal parameters did not correlate with fasting blood glucose, glycated haemoglobin ( $p>0,05$ ) and arterial hypertension. Longitudinal follow-up of CVI could indicate its utility as optical biomarker in monitoring diabetic coroidopathy.

Class no.

4



RO.81.

Title EN

### CLINICAL MANAGEMENT OF SDSS PATIENTS WITH POLITHERAPEUTICAL APPROACH – BALNEO-PHYSIOTHERAPY- OZONE AND ACUPUNCTURES

Authors

Laura Elisabeta Checherita, Bogdan Petru Bulancea, Iulian Costin Lupu, Carausu Elena Mihaela

Institution

**Gr.T.Popa University of Medicine and Pharmacy, Iași**

Description  
EN

Oro-facial dyskinesia is present as hemiparesis, paresis or paralysis, determines complications of muscle contractions, spasms affecting the muscles of the stomatognathic system.

Techniques of balneo-physio-kinetotherapy and oral rehabilitation are general measures approach, which are addressed to all patients for maintaining the homeostasis of the whole body and also of the cephalic extremity, as well as specific measures, targeted in our case at the level of the stomatognathic system.

Treatment strategies in the rehabilitation of muscle of the stomatognathic system aims to *reduce or eliminate pain*, restoring functionality within limits of the stomatognathic system, homeostasis and improving living quality conditions.

They shall be carried out in accordance with an individualized therapeutical scheme and gradually complying with the principles and concepts of complex oral rehabilitation.

Acupuncture and is a form of alternative medicine in which thin needles are inserted into -.TMJ aria It is a key component of Traditional Chinese Medicine (TCM). TCM theory and practice are not based upon scientific knowledge, and acupuncture is a pseudoscience. There is a diverse range of acupuncture theories based on.

The medical ozone used in medicine is derived by the conversion of oxygen (O<sub>2</sub>) for O<sub>3</sub>. Ozone is an antioxidant and activates the immune system. The medical purpose of ozone is the activation of the circulation and regeneration of the organic functions which changed during various diseases.

The association of these treatments ,ozone and accupunture is preferred over mono therapy.

Various results were obtained from the batch of patient, from very good to satisfactory: from total remission of symptoms (muscle pain, limitation of mouth opening, muscle spasm, muscle hypertonia, alteration of mandibular dynamics trajectories), partial remission of symptoms up to no change in the symptoms. Quantification of results was done according to a classification that is easy to apply. It was observed that in the short term the best results were achieved in patients who associated balneo-physio-kinetotherapy etiological and symptomatic therapy

**Class no.**

4

**RO.82.**

**Title EN**

**A problem based learning approach for instructing medical students on optic nerve cavernous hemangioma masked by Graves ophthalmopathy**

**Authors**

Anisia-Iuliana Alexa, Alina Cantemir, Iustina Silvia Cretu Silivestru Iustina Silvia, Madalina Belibou, Florentina Severin, Roxana Elena Ciuntu, Anton Nicoleta, Oana Olariu, Daniel Schwarz, Ioan Adrian Ciureanu

**Institution**

**Grigore T. Popa University of Medicine and Pharmacy, Iași**

**Description EN**

A young 39-year-old patient, known for thyroid pathology, is presented to the Ophthalmology Clinic for examination, accusing asymmetric bilateral asymmetric axial exophthalmia with super-nasal dysplasia of the eyeball in the left eye. Pathology began four months before presentation and slowly installed without pain or other associated symptoms. The initial ophthalmological examination revealed more bilateral exophthalmia more obvious in the left eye and limited motility of the eyeball.

Thyroid ultrasound showed the non-homogenous aspect of thyroid

tissue through the presence of nodular and cystic formations. In this context, the presumptive diagnosis was thyroid ophthalmopathy. A cranio-cerebral computer tomography highlighted in the left orbit a retrobulbar tumor that induces a mass effect on adjacent structures, shows a fat-separating plan against the eyeball (previously displaced), does not determine the juxtapositional osteolysis area. This case requires a differential diagnosis between: arterio-venous vascular malformation, capillary hemangioma, optic nerve glioma, schwannoma. Consequently, the cranio-cerebral MRI confirmed the presence of a left orbital tumor, with benignity characteristics representative for cavernous hemangioma.

The final diagnosis is cavernous haemangioma and Graves ophthalmopathy. It is recommended to follow the evolution of tumor formation by ophthalmological and imaging re-evaluation at 6 months. Surgery will be indicated under ophthalmic symptoms. The specificity of the case is due to the coexistence of the two pathologies which highlights the importance of complete evaluation of patients with thyroid pathologies because the Graves ophthalmopathy can hide other pathologies of the orbit.

**Class no.**

4

**RO.83.**

**Title EN**

**Fractal analysis of direct composite resin surface characteristics after finishing and polishing**

**Authors**

Nica Irina, Iovan Gianina, Pancu Galina, Andrian Sorin, Stoleriu Simona

**Institution**

**University of Medicine and Pharmacy „Grigore T. Popa” Iași, Romania**

**Description EN**

The aim of the study was to evaluate by fractal analysis the surface characteristics of different direct restorative materials after finishing and polishing procedures. Two composite resins were investigated: a high viscosity, nano-filled, universal composite resin- Filtek Ultimate Universal Restorative (3M ESPE) and a flowable, nano-filled, composite resin- Filtek Ultimate Flowable Restorative (3M ESPE). Twenty cylindrical samples of each material having the high of 2 mm and the diameter of 5 mm were prepared in metallic molds. The samples were randomly and equally split in 4 groups (one control group- the samples were not finished and polished and other 3 groups according to the system used for finishing and polishing: two steps Sof-Lex system, 3M ESPE, multi-steps Super Snap system, Shofu, Inc. Kyoto, Japan and multi-steps OptiDisc system, KerrHawe SA). The surface microstructure of the samples was assessed by SEM (VEGA II LSH TESCAN

microscope) and AFM (NTEGRA SPECTRA, NT-MDT) evaluation. The fractal analysis was performed on SEM and AFM images and the mean fractal dimension was calculated for each sample using FracLac software. Decreasing fractal dimension with increasing SEM magnification was observed for both tested materials. Multi-steps OptiDisc system determined the biggest decrease of fractal dimension for both materials, followed by Sof-Lex system. Super Snap system did not lead to significant changes of fractal dimension. Fractal analysis seems to be an appropriate method to investigate the complex structure of composite resins.

**Class no.** 4

#### RO.84.

**Title EN**

**Device With Fast Feedback For Cardiopulmonary Resuscitation**

**Authors**

Dimitrie-Cristian FODOR

**Institution**

**Faculty of Medical Bioengineering, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania**

**Patent**

Patent application No. A/00155/2019

**Description  
EN**

A device with fast feedback for cardiopulmonary resuscitation (CPR) has been designed to operate by a single rescuer (prepared or unprepared for first aid, even with low-grade physical disabilities), which can be used in combination with an automated external defibrillator (AED), to get the maximum benefit of the person in the cardiac arrest. The device provides an optimal amount of respiratory medium in the victim's lungs, after automatic, personalized and customized airways unlocking (depending on the individual phenotype of the victims), at optimal parameters for the human body, to extend vital functions until the emergency medical crew arrives.

The rescuer, while performing chest compressions, receives continuous feedback from the device, with regard to the CPR maneuvers which he performs on the victim (the fast feedback determines the self-adjustment of the rescuer's maneuvers for saving the victim), also, the device measures and stores certain biomedical parameters of the victim, making out of this tool an innovative and necessary device for medical emergency.

**Class no.** 4, 12

**RO.85.**

<b>Title EN</b>	<b>Non-Conventional Method For Separation Of 7-Aminocephalosporanic Acid</b>
<b>Authors</b>	Anca Irina Galaction <sup>1</sup> , Mădălina Poștaru <sup>1</sup> , Alexandra Tucaliuc <sup>2</sup> , Dan Cașcaval <sup>2</sup>
<b>Institution</b>	<sup>1</sup> “Grigore T. Popa” University of Medicine and Pharmacy of Iasi <sup>2</sup> “Gheorghe Asachi” Technical University of Iasi
<b>Patent</b>	Patent demand A-00548/25.07.2018
<b>Description EN</b>	7-aminocephalosporanic acid (7-ACA) is the building-block chemical structure of cephalosporin antibiotics and intermediates. Modifications of side-chains of 7-ACA affect the antibacterial activity and can lead to the alteration of pharmacokinetic properties and receptor binding affinity, thus creating new class of cephalosporin antibiotics with important clinical uses. The most commonly used method to produce 7-ACA at industrially scale is chemical deacylation of chephalosporin C, but in the past decade, enzymatic methods for deacylation have attracted more attention in the manufacturing of cephalosporin antibiotics and several enzyme-based methods have been developed. Following the enzymatic conversion process of cephalosporin C to 7-aminocephalosporanic acid, the product must be isolated from the reaction mixture. This invention presents a new method for the separation of 7-ACA from aqueous solutions obtained by enzymatic conversion, namely reactive extraction, using di-(2-ethylhexyl) phosphoric acid (D2EHPA) as extractant, dissolved in n-heptane. Relative to the initial aqueous solution, the total acid separation yield reached 97% by using 20g/l D2EHPA.
<b>Class no.</b>	4

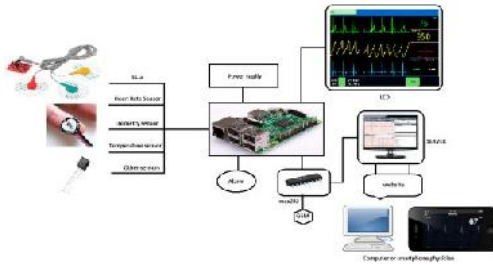
**RO.86.**

<b>Title EN</b>	<b>PATIENT MONITORING SYSTEM USING RASPBERRY PI</b>
<b>Authors</b>	Corciovă Călin, Fuior Robert, Doru Andrițoi, Luca Cătălina
<b>Institution</b>	<b>University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Faculty of Medical Bioengineering</b>
<b>Description EN</b>	Health is one of the global challenges for humanity. In the last decade the healthcare has drawn considerable amount of attention. The goal was to develop a reliable patient monitoring system so that the healthcare professionals can monitor the patients, who are either hospitalized or executing their normal daily life activities. With the system developed by us, we are measuring patient’s parameters

(ECG, temperature, heart rate, pulse, etc) from different available sensors. This sensor collected data i.e. biometric information is given to Raspberry Pi and then it is transferred to server. Biometric information gathered can be wirelessly sent using different options available such as Wi-Fi, 4G, GSM, Bluetooth, 802.15.4 and ZigBee depending on the application. The data stored in a database and can be displayed in a website that can be accessed only by authorized personnel. The patients connect the sensors to their body and the other end of the sensors is connected to Raspberry Pi. The data acquired by sensors is stored in the Raspberry Pi B+. The data values (i.e. Biometric data) are shown on LCD display and at the same time if the values exceed the normal range, the alarm triggers. The values stored are sent to server with the help of GSM. Controls and biomedical signal processing purchased were made in Atmel Studio 7. All the values are stored on the server and the most recent value is displayed on webpage. The physicians along with their login credentials can login and see the patient data.

Class no.

4



RO.87.

Title EN

**ELECTRONIC DEVICE FOR POSTURAL CORRECTION**

Authors

Bădărău Cristian, Vizitiu Denisa-Andreea, Vasilică Alexandra

Institution

**University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Faculty of Medical Bioengineering**

Description EN

Postural vices acquired at an early age or during daily activities, that involve muscle imbalances and improper posture, tend to become permanent. The long-term consequences consist of spine pain or neck pain, and pathologic bend of the spine. A simple solution to avoid the gravest effects of a poor posture is represented by monitoring and control of inadequate posture using special designed devices that signal improper posture, in order to be corrected. The main objective of this project is to develop a wearable device, created to detect postural irregularities in an early stage. The sensors are used for recognizing poor postural habits and positioned



along the spine, the microcontroller processes the signal provided by sensors and converts it from analogue to digital, and output the result, by reminding the patient through luminous signals and vibration about the necessity to correct the posture. A proper calibration is required for adapting the device for any patient, regardless of age or gender. These days, the correction of posture is significant for maintaining the wellbeing and comfort of a person that sits numerous hours at an office desk and does not have an ergonomic space for work. Relevant work in the field was conducted, and various devices were placed on the market at high prices, and usually do not cover the requirement to monitor the entire position of the spine. Nonetheless, wearable technology for posture correction is now a point of considerable importance in preventing postural problems.

4

RO.88.

Title EN

**MEDICAL DEVICE FOR POST-STROKE REHABILITATION BASED ON SMART MIRROR**

Authors

Bordaş Alexandru-Marian, Simion Evelina-Ionela, Căsuță Adelina-Cristina, Derla Carol-Robert

Institution

**University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Faculty of Medical Bioengineering**

Description  
EN

People with motor disabilities experience limitations in fine motor control, strength and range of motion. These deficits can dramatically limit their ability to perform daily tasks, such as dressing, hair combing and bathing, independently. In addition, these deficits can reduce participation in community and leisure activities, and even negatively impact occupational perspectives. The most effective way to improve neuroplasticity and subsequent recovery of motor function following injury or disease to the nervous system is through intense skilful practice. The neurological impairments that can result from a stroke include hemiparesis, coordination difficulties, apraxia, and impairments in postural control. This study developed a Kinect-based rehabilitation system to assist therapists in rehabilitating people who survived different types of stroke. The device is based on Microsoft Kinect which is a webcam-style add-on peripheral intended for the Xbox 360 game console and a smart mirror that consists of a 2-way acrylic mirror specially treated with a display placed behind it. The system retains both the refraction qualities of the mirror and in the same time the elements on the display. Beyond the intentional purpose of playing games, we used Kinect's human gesture recognition capabilities to determine if the user performed the rehabilitation game correctly.

With this neurorehabilitation tool, patients should be able to perform their therapies in an independent, simple, and interesting way. In addition, patients may continue their rehabilitation without constant supervision of their work and progress by therapists.

**Class no.** 4

**RO.89.**

**Title EN**

**SMART MONITORING SYSTEM OF VITAL SIGNS OF THE NEWBORN USING TEXTILE ELECTRODES**

**Authors**

Căsuță Adelina-Cristina, Derla Carol-Robert, Bordaș Alexandru-Marian, Simion Evelina-Ionela

**Institution**

**University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Faculty of Medical Bioengineering**

**Description  
EN**

The monitoring of vital signs, in the case of new-born babies, is of utmost importance. The main purpose of this science project is to develop a monitoring system which will use the newest medical technology in a unique way that is easy to wear and it has reduced cost. The new technology developed and implemented in the project proposes the following: a smart monitoring system, based on textile electrodes, which are utilised in prelevation of vital signs from new born babies, breast feeding children with congenital cardiac disorders and premature born children. Our main interest points lays on recording a ECG, computing the cardiac frequency and monitoring spontaneous breathing. The innovative and challenging element brought into this project is the manufacturing of textile ECG electrodes and the fact that these electrodes are perfectly washable thanks to the easy to fit connection, since these electrodes are imperfect the system will enlarge any artefact at the level of the electrode in the ECG recording. The apnea of prematurity is the most frequent problem which affects premature newborn due to improper development of the respiratory system and the congenital cardiac pathology is the most frequent disorder that affects the new born babies. Therefore we propose to make an easy to wear system that will monitor this special category of fragile patients. We aim to offer applicability in the Neonatal Intensive Care Unit and in the Pediatric Intensive Care Unit as well as easy home usage by the parents.

**Class no.** 4

**RO.90.****Title EN****VIRTUAL REALITY IN THE REHABILITATION OF PATIENTS WITH NEUROMOTOR DISABILITIES****Authors**

Simion Evelina-Ionela, Bordaş Alexandru-Marian, Derla Carol-Robert, Căsuță Adelina-Cristina

**Institution****University of Medicine and Pharmacy “Grigore T. Popa” Iasi, Faculty of Medical Bioengineering****Patent no.****Description EN**

The medical rehabilitation of a patient with neuromuscular disabilities becomes one of the main methods of treatment after trauma, aiming to reeducate the disabled person. Recovery of an individual with neurological deficits begins in the acute phase of the disease, over time regaining a certain degree of autonomy. In case of degenerative or slow progressive diseases, recuperatory procedures should be intermittently prolonging the active period of life. With the technological expansion in medical space, a new concept of medical rehabilitation was created through Virtual Reality technologies. Virtual Reality (VR) refers to a system of concepts, methods and techniques that are used to design and build software products to be used with modern computing systems. The project aims to rehabilitate the patient through designed and projected interactive games and capture his movements with the Kinect sensor powered by Microsoft. In order to ensure proper rehabilitation training, real-time feedback will be insured to the patients and an analysis of the movements will be provided to the medical specialists to follow up with his recovery. The main reason for this project is to simplify and offer the patient the opportunity to achieve medical rehabilitation treatment in the comfort of his own home, with or without specialized help.

**RO.91.****Title EN****MEDICAL DEVICE FOR REHABILITATION OF THE HAND AND UPPER EXTREMITY****Authors**

Simion Mădălina-Petronela, Atodiresei Irina, Mitocariu Adina-Ecaterina

**Institution****“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering****Description EN**

Rehabilitation equipment leads to faster recovery or improvement of certain deficiencies in patients, resulting in an increase in the quality of their lives and/or their social reintegration. The main objectives of this device are monitoring

and rehabilitation of patients presenting dysfunctions in the upper limb (hand). This type of devices have, over the years, undergone various transformations at both structural and technological level. It can be used by patients suffering from certain dysfunctions as well as to prevent their appearance. The system architecture is made using a glove by connecting five tensiometric marks, located at the level of each finger of the upper limb. In order to check the functionality of the system, the subject is asked to perform flexion and extension movements of the fingers, thus real-time bending data of each tensiometric mark is acquired. The data can be used for diagnosis upon analysis by a specialist. Usual technology for this kind of devices is expensive and for this reason, through this paper, we try to lower the cost of the equipment. On the chance that this current version of our device will accomplish helping people, our next step will be perfecting it and working on improving its acquisition capabilities and its general functionality.

## RO.92.

**Title EN**

**Novelty in the treatment of knee osteoarthritis by injection of hyaluronic acid combined with muscle electrostimulation**

**Authors**

Ilie Onu

**Institution**

**“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering**

**Description**

**EN**

Knee osteoarthritis (KOA) is a disabling slow progressive disease. KOA is manifested by pain, limited mobility, erosion of articular cartilage, joint deformity and muscle weakness. Unfortunately, there are no effective treatments to stop the progression of the disease.

Arthrogenic Muscle Inhibition (AMI) is a reflex phenomenon of the knee extensor muscle present in KOA. AMI is manifested by muscle weakness and instability of the knee joint, generating a vicious circle in which pain is an important participant. Chronic pain limits physical activity and leads to the weakening of the extensor mechanism of the knee – it is manifested by the atrophy of the quadriceps muscle. Decreasing the quadriceps force is caused by the mechanoreceptors inside the arthritic knee that in a reflex way alters the corresponding entry, which in turn reduces the effector output from the motoneuron alpha of the quadriceps. Reducing the excitability of alpha motoneuron is a consequence of the involvement of cortical pathways. Muscle Electrostimulation (EMS) trains of the quadriceps

muscle, inhibits pain during exercise and excites motoneuron alpha. The use of Hyaluronic Acid (HA) injected intraarticularly into KOA's is an medium term treatment and it has proven effective in prevent disease progression. A single dose injected with HA has an anti-inflammatory, analgesic and lubricating effect that lasts up to one year. A minimum period of training with EMS lasts 4 weeks with repetitions. Novelty is the limitation of KOA evolution by combining the quadriceps muscle training with EMS and intra-articular knee infiltration with HA.

**Class no.**

**RO.93.**

**Title EN**

**OXIDATIVE STRESS - CONSEQUENCE OF PHYSICAL INACTIVITY**

**Authors**

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**Institution**

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Iasi

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**Description**

**EN**

The physical activity positively influence the biomarkers of oxidative stress, being determinant on the muscles and human motion. The study prove that aerobic exercises increase endogenous antioxidant status. Regular moderate exercises produce an increase in antioxidant activity, due to the changes in redox homeostasis. The constant physical activity increase the body's antioxidant system and protect against oxidative stress. Free radicals and reactive oxygen species are produced in the human body as a part of metabolic processes. Reactive species in low levels are important for cellular activities. Excessive amounts of reactive species can be harmful because they can produce lipid peroxidation, proteins and ADN oxidation. For reduce these harmful effects, the organism requires an antioxidant defence. Oxidative stress is involve in atherosclerosis, coronary heart disease, metabolic syndrome, type 2 diabetes mellitus.

## “Dunarea de Jos” University of Galati

### RO.94.

**Title EN** **Method For Preparing And Treating Cloths Of Carbon, Kevlar And Carbon-Kevlar Fibres With A View To Forming Composite Polymeric Boards**

**Authors** Adrian CÎRCIUMARU, Gabriel ANDREI, Iulian Gabriel BIRSAN, Dumitru DIMA

**Institution** **Dunarea de Jos University of Galati, Romania**

**Patent no.** RO126293

**Description EN** The invention relates to a process for treating cloths made of carbon Kevlar or carbon-Kevlar fibres to be used for manufacturing composite polymeric boards. According to the invention, the process consists in washing the extended cloth by pulverization of a surface-active solution, degreasing the same by pulverization of a sodium hydroxide solution, rinsing with water jet, drying naturally 24 h, at the ambient temperature, applying by pulverization a solution of 30% hypochlorite, followed by natural drying for 1 h, applying by pulverization a solution of 20% polybutadiene rubber additivated with 6% aluminosilicate and 6% amorphous carbon, followed by natural drying for 2 h, applying by pulverization a component A - epoxy precursor additivated with 6% aluminosilicate and 6% amorphous carbon, followed by natural drying for 2 h, applying by pulverization a component B - amine precursor additivated with 6% aluminosilicate and 6% amorphous carbon, followed by a final natural drying for 24 h at the ambient temperature.

### RO.95.

**Title EN** **Procedure for obtaining of asymmetrical polymer membrane with permanent hydrophilicity used in the use of surfaces and substrates through ultrafiltration**

**Authors** Laurentia Geanina TIRON (PINTILIE), Stefan BALTA, Andrei Victor SANDU, Iulian Gabriel BIRSAN, Ioan Gabriel SANDU, Kamel EARAR, Ion SANDU

**Institution** **Dunarea de Jos University of Galati, Romania**

**Patent** Pending

**Description EN** The present invention relates to a polymeric membrane with permanent hydrophilicity having a stratigraphic profile of pore displacement with low asymmetry and which, according to the results obtained by integrity tests, has a much higher flow rate than high asymmetric or isotropic membranes. The membrane is of polysulphonic type (PSf) prepared from

homogeneous and stable casting solutions using a single hydrophilic polymeric solvent, 1-methyl-2-pyrrolidone (NMP, 99.0%).

**RO.96.**

Title EN	<b>Epoxy Matrix Additivated With Carbon Nanotubes And Starch</b>
Authors	Circiumaru Adrian, Andrei Gabriel, Dima Dumitru, Murarescu Monica
Institution	<b>Dunarea de Jos University of Galati, Romania</b>
Patent	RO128730
Description EN	The invention relates to an epoxy matrix for producing polymeric composites. According to the invention, the matrix consists of an epoxy resin additivated with 2% carbon nanotubes and 10% starch, as a dispersion agent, the percentage being expressed by volume, where the matrix provides the improvement of thermal, electric, mechanical and tribological behaviour of the claimed polymeric composite.

**RO.97.**

Title EN	<b>3D Printing of Flexible Strain Sensor Using Thermoplastic Polyurethane/Multi-Walled Carbon Nanotube Composites</b>
Authors	Stanciu Nicoleta-Violeta, Manole Iulian, Stan Felicia, Fetecău Cătălin
Institution	<b>Center of Excellence Polymer Processing, Dunărea de Jos University of Galați</b>
Description EN	In this research, the feasibility of 3D printing of flexible strain sensors using thermoplastic polyurethane/multi-walled carbon nanotube (TPU/MWCNT) composites is investigated. First, the TPU/MWCNT filaments with different MWCNT weight fractions are extruded using a single screw extruder with a 3-mm diameter die, and strain sensors with different configurations are 3D printed using the TPU/MWCNT filaments. Then, the electro-mechanical response of the filaments and flexible printed sensors is investigated under different experimental conditions. Based on the experimental results, the performances of the TPU/MWCNT strain sensors are assessed (the gauge factor, sensitivity and stretchability).

## Ștefan cel Mare University of Suceava

### RO.98.

<b>Title EN</b>	<b>Thermomechanical safety lock</b>
<b>Authors</b>	NIȚAN Ilie, MILICI Laurențiu-Dan, POIENAR Mihaela, PENTIUC Gheorghe, SABADAȘ Anna, MILICI Mariana Rodica, BOBRIC Crenguța-Elena, IRIMIA Daniela, RAȚĂ Gabriela, OLARIU Elena-Daniela
<b>Institution</b>	<b>Ștefan cel Mare University of Suceava</b>
<b>Patent no.</b>	Patent application No. A/00158/2018
<b>Description EN</b>	The invention relates to thermomechanical safety lock with bimetallic blades and intended for the protection of mechanical gear of the drive system (wheel) subjected to heating. Two thermobimetallic elements are fixed rigidly at one end by means of two bolts and which, during operation, when the temperature increases, provides additional locking.
<b>Class no.</b>	5. Industrial and laboratory equipments

### RO.99.

<b>Title EN</b>	<b>Interlocking system</b>
<b>Authors</b>	NIȚAN Ilie, MILICI Laurențiu-Dan, POIENAR Mihaela, CERNUȘCĂ Dumitru, PAȚA Sergiu Dan, PIANÎH Alexei, PENTIUC Radu Dumitru, POPA Cezar, RAȚĂ Mihai, UNGUREANU Constantin
<b>Institution</b>	<b>Ștefan cel Mare University of Suceava</b>
<b>Patent no.</b>	Patent application No. A/00157/2018
<b>Description EN</b>	The invention relates to an interlocking system made on the basis of two elastic elements of Nitinol (shape memory material), intended to lock doors, shutters, in order to assure constructions or installations. Applications: interlocking system for auto industry, aeronautics industry, security systems.
<b>Class no.</b>	5. Industrial and laboratory equipments



**RO.100.****Title EN****Vibromotor****Authors**

NIȚAN Ilie, MILICI Laurențiu-Dan, POIENAR Mihaela,  
 UNGUREANU Constantin, OLARIU Elena-Daniela,  
 POPINCIUC Elena, CERNUȘCA Dumitru, PENTIUC  
 Radu-Dumitru

**Institution****Ștefan cel Mare University of Suceava****Patent no.**

Patent application No. A00518/9.07.2018

**Description  
EN**

The invention relates to a polymeric electric vibrator driven to convert the vibration motion into a continuous linear or rotation motion. The technical problem solved by the invention consists in increasing the torque value of the shaft and constructively simplifying it. The vibrator is made up of a disc-shaped rotor on which a slat is traversed, and which blade is fixed to the support plate of a sandwich vibrator module made of copper plates, fed from an alternating industrial frequency voltage source, having interleaved plexiglas plates between them.

**Class no.**

5

**RO.101.****Title EN****Clutch based thermocouple****Authors**

CERNUȘCĂ Dumitru, MILICI Laurențiu-Dan, NIȚAN Ilie,  
 POIENAR Mihaela, PAȚA Sergiu, CENUȘĂ Mihai,  
 BREABĂN Bogdan, POPA Cezar-Dumitru

**Institution****Ștefan cel Mare University of Suceava****Patent no.**

Patent Application No: A/00519/9.07.2018

**Description  
EN**

The invention relates to a clutch based thermocouple made of Nitinol elements for coupling or disconnecting some rotating motion systems. The technical problems solved by the invention consist in constructive simplicity, reduction of sizing complexity, increase of speed control by coupling speed and widening of applicability. The thermocouple consists of an outer drum, which in its interior has a system of independent ferrite patches that are positioned with the aid of Nitinol elements, the force of which on the drum is dependent on speed and temperature.

**Class no.**

2: Energy and sustainable development

**RO.102.**

<b>Title EN</b>	<b>System and method for measuring and connecting single-phase electric energy consumers</b>
<b>Authors</b>	CENUȘĂ Mihai, MILICI Laurențiu-Dan, ROMANESCU Adrian, ȚANȚA Ovidiu, NIȚAN Ilie, POIENAR Mihaela, ATĂNĂSOAE Pavel, PRODAN Cristina, AFANASOV Ciprian, VLAD Valentin
<b>Institution</b>	<b>Ștefan cel Mare University of Suceava</b>
<b>Patent no.</b>	Patent application No. A/00409/08.06.2018
<b>Description EN</b>	The invention relates to a system and method for measuring and connecting single-phase consumers fed from low-voltage electrical networks in order to reduce the loss of electricity. The technical problem solved by the invention consists in reducing the power losses in the low voltage power lines due to unbalance introduced by the single-phase consumers simultaneously with the metering of the consumed electrical energy. The system consists of an automatic switching system for the electrical load absorbed by the single-phase consumer on any of the three phases of the electrical network integrated into a measuring counter
<b>Class no.</b>	2: Energy and sustainable development

**RO.103.**

<b>Title EN</b>	<b>Flood protection system in buildings</b>
<b>Authors</b>	CENUȘĂ Mihai, MILICI Laurențiu Dan, POIENAR Mihaela, TOADER Eusebiu Vasile, ATĂNĂSOAE Pavel, POPA Cezar Dumitru, PIANÎH Alexei, SABADAȘ Anna
<b>Institution</b>	<b>“Ștefan cel Mare” University Suceava.</b>
<b>Patent no.</b>	Patent application No. A/00016/14.01.2019
<b>Description EN</b>	The invention relates to a flood protection system caused by failures at the domestic and residential consumer water supply installations. The technical problem solved by the invention consists in the reliable detection of leakage from water supply systems and the minimization of the effects produced by them. The system consists mainly of an automatic water-stop system when a water loss is detected in the consumer's water supply system.
<b>Class no.</b>	2: Energy and sustainable development

**Regele Mihai I al României  
Banat University of Agricultural Science  
and Veterinary Medicine, Timisoara**

**RO.104.**

<b>Title EN</b>	<b>TASTY PASTE</b>
<b>Authors</b>	Popa Viorica – Mirela, Raba Diana Nicoleta, Moldovan Camelia, Dumbravă Delia – Gabriela, Mișcă Corina Dana, Borozan Aurica Breica, Bordean Despina Maria
<b>Institution</b>	Universitatea de Științe Agricole și Medicină Veterinară a Banatului “Regele Mihai I al României“ din Timișoara, România
<b>Patent no.</b>	M2018/02979 / 07.05.2018 Tasty Paste, an innovative meat aperitif food product, is a pate of pheasant meat with natural ingredients: lovage and apricot kernels.
<b>Description EN</b>	The pheasant meat pate was made by grinding and homogenizing a mixture of meat, liver and pheasant soup, butter, onion, garlic, spices, apricot kernels and lovage. After homogenization, the product was sterilized and then packaged in hermetically sealed jars. The lovage has anti- inflammatory, antibacterial, antiparasitic, antiviral, antifungal action, and apricot kernels content rich in vitamin B17 - amigdaline, a substance used as a non-conventional method in curing cancer.
<b>Class no.</b>	Invention Classification 3

**RO.105.**

<b>Title EN</b>	<b>NATURAL PREPARATIONS WITH ANTIFUNGAL AND ANTIMICOTOXIGEN ACTION USED AS CEREAL PROTECTION AGENTS AND THEIR OBTAINING PROCESS</b>
<b>Authors</b>	Alexa Ersilia, Sumalan Renata Maria, Lintia Vasile, Negrea Monica, Obistioiu Diana, Pop Georgeta, Radulov Isidora, Crista Laura, Rus Cristian
<b>Institution</b>	Universitatea de Științe Agricole și Medicină Veterinară a Banatului “Regele Mihai I al României“ din Timișoara, România
<b>Patent no</b>	<b>OSIM A 00561/31.07.2018</b>
<b>Description EN</b>	The invention relates to natural antifungal and antimycotoxic nanoemulsion products based on essential oils obtained from

plants belonging to Lamiaceae and Umbelifere families, with foliage and seeds application, for use in biological agriculture and a process for their production using a compatible method with organic farming. The in vitro and in vivo tests demonstrated the effectiveness of the preparations in controlling the development of *Fusarium*, especially *Fusarium graminearum* and mycotoxin production in cereals and plant seeds, correlated with stimulating effects on cereals germination and chlorophyll content in the vegetation phase of plants. Products are recommended for antifungal protection in grain storages as well as in vegetative phases of plants, in field.

**Class no.** 3

**RO.106.**

**Title EN**

**HAIR 10 TONIC**

**Authors**

Dumbravă Delia-Gabriela, Alexa Ersilia Călina, Bordean Despina Maria, Borozan Aurica-Breica, Botău Dorica, Drugă Mărioara, Hădărușă Nicoleta-Gabriela, Mișcă Corina-Dana, Moldovan Camelia, Popa Viorica Mirela, Raba Diana Nicoleta, Ștef Ducu Sandu

**Institution**

Universitatea de Științe Agricole și Medicină Veterinară a Banatului "Regele Mihai I al României" din Timișoara, România

**Patent no.**

M2019/00512 din 29.01.2019

**Description**

**EN**

Scalp and hair tonic lotion from 10 plants: burdock (*Arctium lappa*) root, nettle (*Urtica dioica*), hot pepper (*Capsicum annuum*), ginger (*Zingiber officinale*), walnut (*Juglans regia*) leaves, birch (*Betula pubescens*) bark, horse tail (*Equisetum arvense*), coriander (*Coriandrum sativum*) fruits, rosemary (*Rosmarinus officinalis*) leaves, black pepper (*Piper nigrum*), in varying proportions, according to the recipe for manufacturing. Tonic stops excessive hair loss, improves microcirculation on the scalp, nourishes hair follicles, stimulates hair growth.

**Class no.**

4

**RO.107.****Title EN**

PROCEDURE FOR OBTAINING A PRODUCT BASED ON SALT EXTRACT (GEN SALIX)

**Authors**

Poșta Daniela, Hădăruș Nicoleta Gabriela, Peș Elena, Poșta Gheorghe Marinel, Peș Ioan, Camen Dorin Dumitru, Hădăruș Daniel Ioan

**Institution**

**Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" – Timișoara**

**Patent**

Patent RO131178 (B1) — 2019-01-30

**Description EN**

A rooting product for biostimulation of plant root system based on combined solid-liquid and steam distillation-extraction of willow (gen. Salix) sprouts at the beginning of vegetation have been developed and successfully tested. The combined separation of extracts was performed at 50-100°C and 0.14-1 atm, for 12...24 h. The aqueous extract was optimized from the bioactive compound content point of view (e.g., salicylates and auxins). The extract was successfully applied for enhancing the rooting of thuja and other model plants.

**Class no.**

3

**RO.108.****Title EN**

Regenerating mask for all types of hair and scalp

**Authors**

AHMADI-KHOIE Mirela, MILOVANOV Cornelia, MEDERLE Narcisa, MORARIU Florica-Emilia, MORARIU Sorin, DRONCA Dănuș Dorel, CHEȘ Cornelia, AHMADI-KHOIE Teymoor, ȘTEF Lavinia

**Institution**

Universitatea de Științe Agricole și Medicină Veterinară a Banatului "Regele Mihai I al României" din Timișoara, România

**Patent**

Patent application No. A/00870 /5.11.2018

**Description**  
EN

The invention consists in production of a regenerating hair mask and the scalp (for all types), which has only natural biologically-active principles, which is applied locally to hair and sclap – once a week, being a regenerative medicine product human. The regenerating mask contains natural oils (coconut, avocado, argan, olives, castor), fenugreek, fenugreek germs, and amla. After topically application as a regenerating mask on hair and scalp, the absorption is rapid, the hair and scalp after washing do not remain oily, and the product has no allergenic or irritating effect on the human body

**Class no.**

Invention Classification 4



**RO.109.**

**Title EN**

**Geomatic Model for the Investigation and Sustainable Organization of Agro-Silvic Pastoral Systems from the hillsides of Romania**

**Authors**

Luminița Cojocariu, Loredana Copăcean, Mihai Simon, Cosmin Popescu

**Institution**

Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara

**Description**  
EN

The geomatic model based on geospatial techniques and technologies (images taken with drone, processed with the Geographic Information System) was designed for the "inventory of the internal and external structure" of agro-silvic pastoral systems and can be used as a basis for the sustainable organization of rural space. The proposed model incorporates high precision information about: declivity, aspect, microrelief, volume, useful surface, location and surface calculation. Using the model allows organization and reorganization according to the principles of sustainable agriculture, marking areas for punctual interventions, identification of "critical components" that unbalance or induce tensions in the system. As a practical applicability, based on the proposed geomatic model, it is possible: the delimitation of the components of the agro-silvo-pastoral system by category, land use analysis (arable land - forage

crops, pastures, trees and shrubs, built space, vegetation analysis based on spectral response), identifying how to exploit components (mechanized in contrast to traditional methods, pastures used for mowing and/or grazing), landscape analysis, especially for agro-tourism, identify natural or anthropogenic risk factors that can cause system degradation, use as a database for the development of spatial development strategies, use as a support to optimize the socio-economic potential of the agro-silvo-pastoral system.

**RO.110.****Title EN**

**Workflow based on U.A.V. Technology and GIS for the spatio-temporal analysis of meadow grasslands**

**Authors**

Mihai Simon, Cosmin Popescu, Loredana Copăcean, Luminița Cojocariu

**Institution**

Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara

**Description  
EN**

Very large grasslands are in various stages of degradation due to a natural and/or anthropogenic phenomenon that has increased in the last two decades. The proposed workflow involves several steps: establishing the flight path, "photographing" areas of interest, preprocessing and processing aerial images with specialized software and GIS applications (aligning, georeferencing, generating 2D and 3D patterns, orthophotoplane generation) to capture the evolution of time and space in the "pastoral environment". We can use series of aerial images taken over at certain time intervals or in the case of "historical" monitoring, the images taken with drones in the current period can be compared with aerial or satellite imagery available in archives or databases. Meadow grasslands can be affected by the destructive hydrological phenomena and, due to the high humidity, the surface of the grasslands is affected by the installation of hygrophilous vegetation. The proposed workflow based on U.A.V. and GIS technology has practical applicability in the "surveillance" of the space-time behavior of meadow grasslands through: very high resolution of images (allows observation of details), minimal effort on the part of the operator, the possibility of comparison with own pictures or other satellite images, the identification of the past situation, the current state and the possibility of forecasting.

**RO.111.**

<b>Title EN</b>	<b>Algorithm for the application of Remote Sensing data in the identification and delimitation of grassland areas</b>
<b>Authors</b>	Loredana Copăcean, Luminița Cojocariu, Mihai Simon, Cosmin Popescu
<b>Institution</b>	Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara

**Description  
EN**

At the level of Romania, the cadastral records of the areas used as pasture and meadow are in many cases unclear and "mobile", the systematic cadastration procedure being underway. For this reason, the identification of grasslands is done on old cadastral maps, often "non-compliant" with the reality on the ground. Under these circumstances, the idea of developing an algorithm (workflow) for processing satellite imagery to obtain the identification and spatial delimitation of grassland is an "automated", precision alternative that can be easily applied, in short time and on large surfaces. The remote sensing data processing algorithm describes in detail and technically each step that needs to be traced until the final result is obtained: selecting and downloading satellite scenes (at different resolutions), applying radiometric and geometric corrections (if necessary), cutting or mosaic of satellite scenes, contrast enhancement, spectral band combinations, NDVI mapping (to facilitate visual analysis), statistical analysis, segmentation (if necessary) and supervised classification. For grasslands, the use of the proposed algorithm has several theoretical and practical advantages: free space scenes and high temporal resolution can be used (Landsat scenes available over a period of about 35 years), may cover large geographic areas without having to go on site, can be compared to orthophotomaps or other maps available on the area of interest for the adjustment and validation of the results, high resolution spatial resolution images can be used to accurately identify and delimiting, statistical reports, forecasts or comparative analyzes may be prepared.



RO.112.

**Title EN** **MODEL TO ESTIMATE THE OPTIMAL BLOOMING AND FLOWERS HARVESTING INTERVAL IN *LISIANTHUS EXALTATUM* IN RELATION TO VEGETATION PERIOD**

**Authors** BĂLA MARIA, NAN CRISTINA, IORDĂNESCU OLIMPIA, DRIENOVSKY ROBERT, SALA FLORIN

**Institution** Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description EN**

The study followed the flowering dynamics over a 84-day vegetation period, at four genotypes of the species *Lisianthus exaltatum* Salisb. The biological material was represented by the Twinkles Dark Blue (TDB), Arena Series Rose (ASRose), Arena Series Red (ASRed) and Heidi Salmon (HS) genotypes. In relation to the biology of the analyzed genotypes, the vegetation period (VP) under study was of 84 days during which, five flower-counting moments were delineated at 14-day intervals, VP28, VP42, VP56, VP70 and VP84. Based on the average number of flowers open at the time of determination, the highest number of flowers was found in the TDB genotype, followed by genotypes HS, ASRose and ASRed. The statistical regression analysis facilitated the development of a model of a grade 3 polynomial equation and smoothing spline models (for the ASRose, ASRed and HS genotypes), models that most accurately described the flowering dynamics in relation to the vegetation period. Thus, a model of a grade 3 polynomial equation facilitated the estimation of flowering over the study period to the TDB genotype under  $R^2 = 0.996$ ,  $F = 90.681$ ,  $p = 0.0770$ . In the other three genotypes smoothing spline models described the most accurate growth dynamics during the vegetation period under conditions of  $\varepsilon_i = 0.2098$  at the ASRose genotype,  $\varepsilon_i = 0.0593$  at the ASRed genotype and  $\varepsilon_i = 0.0607$  in the HS hybrid. Clustering analysis has facilitated the classification and grouping of observational moments from the study period into two distinct clusters.

**Class no.**

4

**RO.113.**

**Title EN** **MODEL OF PHYSIOLOGICAL INDICES VARIATION IN MAIZE UNDER SILICON INFLUENCE**

**Authors** CĂBĂROIU GABRIEL, RUJESCU CIPRIAN IOAN, SALA FLORIN

**Institution** Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description EN** The study analyzed the variation of some physiological indexes of maize leaves, the Lovrin 400 hybrid, under the influence of silicon treatments (0, 0.1 ml l<sup>-1</sup>, 1.0 ml l<sup>-1</sup>, 1.5 ml l<sup>-1</sup>, 2.5 ml l<sup>-1</sup>). Silicon has favorably influenced the dimensional parameters of the leaves (L, w, LA, Chl, Tl, Sw). There were very high and high correlations between Si and L (r=0.935), Si and Tl (r=0.856), and low correlations between Si and Sw (r=0.687), Si and LA (r=0.675), Si and Chl (r=0.528), respectively Si and L (r=0.500). Linear and polynomial equations of order 2 and 3 facilitated the estimation of the physiological indexes studied on the basis of Si concentration, under statistical safety. The LA variation according to L and w was described by grade 3 polynomial models (LA according to L: R<sup>2</sup>= 0.897, p<<0.001, F=76.089; LA according to w: R<sup>2</sup>= 0.812, p<<0.001, F=37.384).

**Class no.**

3

**RO.114.**

**Title EN** **MODEL OF PRODUCTIVITY ELEMENTS VARIATION IN MAIZE UNDER THE INFLUENCE OF SILICON TREATMENT**

**Authors** CĂBĂROIU GABRIEL, RUJESCU CIPRIAN IOAN, SALA FLORIN

**Institution** Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description EN** The study evaluated the influence of silicon (Si) on the productivity elements of corn cobs, the Lovrin 400 hybrid. Very high correlations were found between Si and Ccw (r=0.967), Si and Gw (r=0.900); high correlation between Si and CvG (r=-0.873), and medium, respectively low correlations between Si and Md (r=0.878), Si and Bd

NATIONAL

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( $r=0.785$ ), Si and Cw ( $r=0.624$ ), Si and L ( $r=0.561$ ). Very high and high correlations have been recorded between L and Cw ( $r=0.959$ ), Bd and CvG ( $r=-0.963$ ), Bd and Cw ( $r=0.908$ ), Ccw and Gw ( $r=0.977$ ), CvG and Ccw ( $r=-0.819$ ), and respectively between CvG and Cw ( $r=-0.841$ ). Polynomial equations facilitated the estimation of Gw according to Ccw ( $p \ll 0.001$ ,  $R^2=0.951$ ,  $F=136.63$ ,  $RMSE=6.089$ ), according to Bd ( $p \ll 0.001$ ,  $R^2=0.701$ ,  $F=25.738$ ,  $RMSE=15.0927$ ), and according to L ( $p \ll 0.001$ ,  $R^2=0.584$ ,  $F=15.414$ ,  $RMSE=17.7996$ ).

**Class no.**

3

**RO.115.**

**Title EN**

**NON-DESTRUCTIVE METHOD FOR DETERMINING THE LEAF AREA OF THE ENERGETIC POPLAR**

**Authors**

CÂNDEA-CRĂCIUN VLAD-CATALIN, RUJESCU CIPRIAN, CAMEN DORIN, MANEA DAN, NICOLIN L. ALMA, SALA FLORIN

**Institution**

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description EN**

Four genotypes of poplar energetic were evaluated, being determined for a random sample of leaves, leaf area (LA), perimeter (P), length (L) and width (W). High values of the correlation coefficients between the series of data determined by these parameters have been identified, which indicated a geometrically well-defined pattern of the leaves. This gave the possibility to determine a calculation formula which, based on the product of leaf length and width, corrected with a specific constant (k) of each genotype, helped to obtain the foliar surface under the conditions of a minimum acceptable error, and safe statistical. The approximation relation of the foliar surface (LA) is  $LA = L \cdot W \cdot k$ . It was chosen opted for such a relationship, to the detriment of other models, because it is defined by a simple expression that can be used efficiently when calculations for a high volume of samples are required. The foliar surface constants k was obtained for each genotype, which made it easier to obtain optimal foliar surfaces based on the dimensional parameters of the leaves. The k values were different for each genotype, and are within the range (0.62, 0.74).

**Class no.**

3

NATIONAL

403

**RO.116.****Title EN**

**Antibacterial activity of essential oils on certain bacteria from the intestinal tract**

**Authors**

<sup>2</sup>Ciobotaru Gabriela Valentina, <sup>1</sup>Imbrea Ilinca, <sup>1</sup>Alexa Ersilia, <sup>1</sup> Botău Dorica, <sup>2</sup>Cristina Dehelean, <sup>2</sup> Corina Danciu, <sup>2</sup>Victor Dumitrașcu, <sup>1</sup>Pop Georgeta

**Institution**

<sup>1</sup>Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara; <sup>2</sup>Universitatea de Medicină și Farmacie "Victor Babeș" Timișoara

**Description EN**

The determination of antibacterial activity was performed by the diffusimetric method on standardized subculture. The reference strains used for the assay were selected to represent bacterial colon colonization colonies (*Klebsiella pneumoniae*, *Shigella flexneri*, *Salmonella enterica*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Candida albicans*, *C. parapsilosis*). Oils to which we have obtained a zone of inhibition area greater than 15 mm have been considered to have antibacterial activity. Oils of certain species were active only on Gram-positive bark and fungi, and others had inhibitory activity on all the reference strains tested. The results confirm the possibility of using essential oils as phytopharmaceuticals.

**Class no.**

4

**RO.117.****Title EN**

**Creating and developing an innovative pumpkin product**

**Authors**

Misca Corina Dana, Raba Diana-Nicoleta, Popa Viorica-Mirela, Moldovan Camelia, Dumbrava Delia-Gabriela, David Ioan, Borozan Aurica Breica, Botau Dorica

**Institution**

Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara

**Description EN**

Pumpkin cream is a new and innovative product that uses the pumpkin as the main raw ingredient. Therefore, a raw material is used that is abundant in our country and is not widely used in the food industry. Thus, together with cow's cheese and other secondary ingredients, a new product was created in the form of a spreading sauce that can be used as an appetizer or together with meat products. As a proposal for processors, there are three variants of the same sauce,

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slightly spicy, where cow cheese, butter or parsley was added to enhance the flavor and nutritional value. A major advantage for the industrialization of this product is that it can be obtained in all types of processing: conventional, natural or ecological. This allows us to place the product under different price categories.

**Class no.** 3

### RO.118.

**Title EN**

#### **Methods of Fresh Pork Meat Tenderisation**

**Authors**

RABA Diana Nicoleta, MOLDOVAN Camelia, DUMBRAVĂ Delia Gabriela, MATEESCU Constantin, PÎRVULESCU Luminita Cornelia, POPA Viorica-Mirela, BORDEAN Despina-Maria

**Institution**

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara;  
The study presents two methods of pork meat tenderisation consisting of immersing and injecting of fresh meat in soy sauce and salt solution. For this purpose three samples of fresh pork shoulder were injected sauce and another three were immersed in 20%, 30% and 40% soy and immersed in 20% salt solution (5% NaCl). The samples were assessed in terms of physicochemical characteristics and compression behaviour. The obtained results showed that the pH was in the range of 6.3 (control) – 5.35 (samples immersed in 40% soy sauce); sugar content was in the range of 0.5Brix (control) – 1.2 (sample injected with 30% soy sauce); the salt content of the samples increased proportional to the concentration of soy sauce used. The water content of immersed samples was lower than those injected and it was situated in the range of 67%-77%. In terms of compression behaviour there were no major differences between the studied samples.

**Description  
EN**

**Class no.**

### RO.119.

**Title EN**

#### **CHARACTERIZATION OF A FOOD SUPPLEMENT**

**Authors**

Juravle L. M., Cocan Ileana, Monica Negrea, Obiștioiu Diana, Alexa Ersilia, Rinovetz A.

**Institution**

**Banat's University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania” Timișoara**

NATIONAL

<b>Description</b> EN	Evaluation of structural and functional changes associated with everyday's stress has generated the appearance of <i>food-drug (nutraceuticals/foods supplements)</i> , with target functions, to compensate for the <i>prophylaxis/therapy of synthetic drugs</i> . The present study brings within discussion obtaining under <i>rustic</i> conditions, of the <i>fir tree syrup</i> from <i>Obcinele Bucovinei</i> , as a <i>food supplement</i> (considered <i>nutraceuticals</i> ), administered in the case of respiratory diseases. Following the study of literature, supported by field studies, we developed a flow chart diagram of operations, including the <i>fortification</i> (by the <i>incorporation of some spices</i> ), of <i>fir-tree syrup</i> . The determination of some quality indicators (vitamin C, Brix°, water, polyphenols), on the resulting products, highlights the increasing antioxidant and antimicrobial activity with increased health benefits.
<b>Class no.</b>	3

**RO.120.****Title** EN**AN APPROXIMATE METHOD OF EVALUATING THE DISTANCES IN SOME AERIAL IMAGES****Authors**

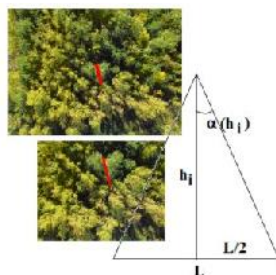
RUJESCU CIPRIAN, CONSTANTINESCU CRISTIAN, HERBEI MIHAL, SALA FLORIN

**Institution**

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description**  
EN

The application consists of the distance evaluation between two points in relation with the height of the camera, based on the theory of regression. Possible uses: determination of the height from which the images were taken depending on the apparent length of a segment, the possibility of programming the height for taking photos in a certain desired format, description of the apparent features of some objects when technically it is not possible to exceed a fixed altitude at which shooting is made.



**RO.121.****Title EN****Development of a strategy for plant variability evaluation based on molecular markers****Authors**

Popescu Sorina, Boldura Oana-Maria, Borozan Aurica, Sarac Ioan, Botau Dorica

**Institution****Banat's University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania”, Timisoara, Romania****Description  
EN**

Using of molecular markers on plant genome analysis allows the evaluation of the degree of relatedness between different genotypes, the establishment of the genetic fingerprint or even the lineage.

The aim of our research was to analyze and compare different types of molecular markers, each of them being distinctive for a specific part of the genome. Therefore the RAPD (Random Amplified Polymorphic DNA) recognized random sequences and amplified that DNA regions, ISSR (Inter Simple Sequence Repeats) are specific for the microsatellites sequences and amplify the fragment between two neighboring regions and DAMD (Directly Amplified Minisatellite DNA) primers amplify the regions between two minisatellites.

First, five ISSR primers were used to amplify the DNA extracted from five different *Salix* species. All the amplified fragments were analyzed, scoring with 1 the presence and with 0 the absence of the bands. Based on five ISSR markers 128 fragments were visualized, 114 being polymorphic (89.1%). The fifth DAMD markers emphasized 94 fragments, of what 87 were polymorphic (92.6%). and the RAPD markers generated a number of 103 fragments, 97 being polymorphic (94.2%).

For each type of markers the dendrograms were different pointing out the differences between the annealing sites for the specific primers. For this reason, it is recommended to use several categories of markers to increase the accuracy and specificity of the results.

**Class no.**

3

RO.122.

<b>Title EN</b>	<b>Development of an alternative method for extracting polyphenols from plants using micro-structured alkaline water</b>
<b>Authors</b>	Tulcan Camelia, Popescu Sorina, Huțu Ioan, Mircu Călin, Marc Simona, Boldura Oana-Maria
<b>Institution</b>	<b>Banat's University of Agricultural Sciences and Veterinary Medicine „ King Michael I of Romania”, Timisoara, Romania</b>
<b>Description EN</b>	<p>Polyphenols are secondary metabolites of plants, being a large and diverse group of substances present abundantly in all medicinal plants. They have antioxidant, anti-inflammatory and biological effects that are manifested in the prevention of pathological conditions.</p> <p>The polyphenol extraction procedures involve several steps by which the plant material is pre-extraction processed, followed by the extraction and after the products are passing through a final processing procedure. Selecting the processing procedure affects the total phenol content. Liquid-liquid and solid-liquid extraction methods are still the most commonly used extraction procedures. Conventional techniques have been widely accepted, mainly because of their simple procedure, but these have a number of disadvantages such as these solvents presenting a potentially dangerous effect on human health, with solvents residues remaining in the final products. This requires additional purification steps that take a long time and influence the overall cost of the process. In addition, by using pure organic solvents, polyphenols cannot be completely extracted.</p> <p>Micro-structured alkaline water is recognized for its solvent properties, providing a very good extraction yield at low temperature, also in this case the presence of toxic residues is totally removed.</p> <p>In this context, the presented project aims to develop a method of extracting polyphenols from plants using micro-structured alkaline water. This method has the advantage that it does not involve the use of organic solvents, it does not use high temperature extraction and by its use the final products are of superior quality pretended for any further processing procedure.</p>
<b>Class no.</b>	



RO.123.

<b>Title EN</b>	<b>The tolerance of SRC willows to salty soils in field and laboratory trials</b> - PN II 111/2014 <i>Evaluation of the productive potential, the capacity of phytoremediation and adaptability to the hydric stress of some Salix genotypes, in improper stations for agricultural crops</i>
<b>Authors</b>	Corneanu Mihaela <sup>1</sup> , Hernea Cornelia <sup>1</sup> , Hollerbach Wilhelm <sup>2</sup> , Babeanu Cristina <sup>3</sup> , Corneanu Gabriel <sup>3</sup> , Sarac Ioan <sup>1</sup> , Netoiu Constantin <sup>4</sup> , Fericean Mihaela Liana <sup>1</sup>
<b>Institution</b>	<sup>1</sup> Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timișoara, <sup>2</sup> REBINA Agrar S.A., <sup>3</sup> University of Craiova, <sup>4</sup> National Institute for Research and Development in Forestry "Marin Drăcea"
<b>Description EN</b>	<p>For the extension of cultivated areas unsuitable for agriculture, with forestry and energy crops, there are necessary comprehensive studies to find optimal solutions - selection of genotypes to their potential production, but also to be adapted at high temperatures and/or severe drought. There were performed tests in field conditions and under simulated NaCl stress (laboratory), associated with the analysis of metabolic processes in different plant organs, followed by the selection of the most valuable genotypes. There were established two comparative plantations in two different locations in Ghilad, Timis District, Romania, in March 2015, 0.5 ha each: Salty soil and Control., with 7 Romanian genotype and 7 Swedish ones. In the laboratory trials for tolerance to NaCl were used 7 Romanian and 3 Swedish genotypes. The results of the field experiments, after 4 vegetation seasons showed different behavior of the genotypes on salty soil and Control. Romanian genotypes are tolerant, both to salty soil and drought (good survival percent and development), while the Swedish ones are sensitive on salty soil, but with a higher growth rate in Control. Laboratory trial pointed out the good tolerance of Romanian clones RO892, RO1077, RO1082 to salinity, proved by the survival rate, shooting process, shoots development, enhanced stress oxidative enzymes activity, as well as different protection mechanisms of the parenchymatic cells.</p> <p>The researches were financially supported by UEFISCDI București, project PN II 111/2014 (SAROSWE).</p>
<b>Class no.</b>	3

**RO.124.****Title EN****Establishing the method of vegetative propagation for Banat peony****Authors**

Drăgicescu Maria, Imbrea Ilinca, Pop Georgeta, Neacșu Alina, Botau Dorica

**Institution****Banat's University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania” Timișoara****Description  
EN**

Peony is an important ornamental and medicinal plant. Five species of spontaneous peony, all protected, of inestimable conservative value are reported in Romania, but which can not be multiplied. *In vitro* technology is successfully used in rapid and efficient regeneration of endemic and rare forms, but the difficulty is finding appropriate protocols. Our researches focused on *Paeonia banatica* Rochel, the Banat peony, rich in active principles, for which the sterilization regime, the hormonal balance and the duration of the growing cycle, depending on the type of explant, were established, for a quick and efficient response to controlled cultivation.

**Class no.**

3

## ”Carol Davila” University Of Medicine And Pharmacy

<b>RO.125.</b>	
<b>Title EN</b>	<b>STANDARDIZED EXTRACTS OF ANTHRISCUS SYLVESTRIS - OBTAINING AND THERAPEUTIC USE</b>
<b>Authors</b>	DINU-PÎRVU Cristina Elena, ANUȚA Valentina, VELESCU Bruno Ștefan, NIȚULESCU George Mihai, OLARU Octavian Tudorel, GHICA Mihaela Violeta, ORȚAN Alina, POPA Ovidiu, BĂBEANU Narcisa
<b>Institution</b>	“Carol Davila” University of Medicine and Pharmacy, Bucharest,
<b>Patent no.</b>	Patent Application No. <b>RO132751(A0)/30.08.2018</b> The invention refers to the obtaining method of a series of <i>Anthriscus sylvestris</i> dry extracts and their physical, chemical and biological characterization. By exploiting the spontaneous <i>Anthriscus sylvestris</i> , based on the pharmacological potential and reduced toxicity, we achieved an original approach to obtaining an anti-inflammatory resource. The obtaining methods used in the processes, according to the invention, lead to dried extracts of <i>Anthriscus sylvestris</i> , with a standardized total content of polyphenols (between 4.4 and 6.6 g% Gallic acid equivalents). The extracts were characterized qualitatively and quantitatively by chromatographic and spectrometric methods.
<b>Description EN</b>	Extracts of <i>Anthriscus sylvestris</i> showed statistically significant anti-inflammatory effect comparative to diclofenac in experimental models of acute and subacute inflammation. The extraction process was reproducible in term of total polyphenolic content. The main advantage of the invention is its capability to provide a pharmaceutical use of the spontaneous <i>Anthriscus sylvestris</i> and to capitalize the plant’s high adaptability and ability to grow rapidly in almost any type of soil.
<b>Class no.</b>	4

**RO.126.**

**Title EN** **RUTHENIUM(III) COMPLEX COMBINATION WITH ANTIINFLAMMATORY ACTIVITY AND ITS SYNTHESIS METHOD**

**Authors** VELESCU Bruno Ștefan, UIVAROSI Valentina, ANUȚA Valentina, ȘEREMET Oana Cristina, NIȚULESCU George Mihai, LUPULIASA Dumitru, ARSENE Andreea Letiția, DINU-PÎRVU Cristina Elena

**Institution** “Carol Davila” University of Medicine and Pharmacy, Bucharest,

**Patent no.** Patent Application No. **A00687/2018**

**Description EN** The present invention relates to the synthesis method of a novel ruthenium (III) complex with ferron (8-hydroxy-7-iodo-5-quinolinesulfonic acid), with in vivo anti-inflammatory activity. The complex was obtained by dissolving the ligand in an appropriate amount of water, to which a saturated aqueous solution of  $\text{RuCl}_3 \cdot x \text{H}_2\text{O}$  in molar ratio metal ion:ligand 1:2 was added. The pH of the mixture was adjusted to 8 with a 2M NaOH solution. The mixture was concentrated to dryness on a water bath, cooled on an ice bath and then approx. 20 mL of ethanol was added. The product was stored at 4°C for 2 hours. The precipitate obtained was filtered off under vacuum and washed with ethanol until the washings were colorless. The final product was dried and stored in an exicator. The complex is a dark green microcrystalline powder, water soluble. The complex presented significant anti-inflammatory effect (superior to diclofenac) in two murine models of inflammation induced with carrageenan and kaolin, respectively.

**Class no.** 4. Medicine - Health Care - Cosmetics

**RO.127.**

**Title EN** **TOPICAL MULTIPARTICULATE DELIVERY SYSTEMS BASED ON BIOPOLYMERS WITH CONTROLLED RELEASE OF AN ANTI-INFLAMMATORY DRUG AND PROCESS FOR THEIR PREPARATION**

**Authors** Ghica Mihaela Violeta, Albu Kaya Mădălina Georgiana, Udeanu Denisa Ioana, Marin Minodora Maria, Marin Ștefania, Kaya Drmuş Alpaslan, Dinu-Pîrvu Cristina Elena, Popa Lăcramioara, Dănilă Elena

**Institution** “Carol Davila” University of Medicine and Pharmacy, NATIONAL

Bucharest, 37 Dionisie Lupu Str., 020021, Bucharest, Romania, e-mail: [rectorat@umfcd.ro](mailto:rectorat@umfcd.ro)

**Patent no.**

Patent Application No. A00388/31.05.2018, summary published in BOPI no. 10/2018

The invention refers to a controlled release multiparticulate system for an anti-inflammatory drug used in the treatment of average severity burns and to a process for obtaining thereof.

The technical issue solved by the invention consists in: (i) obtaining a multiparticulate system of drug controlled release in two steps - a faster release in the first hours followed by a slow release over the next 2 days; (ii) selecting an adequate polymer support, a mixture of collagen and dextran, and a non-steroidal anti-inflammatory drug, flufenamic acid, incorporated into the microcapsules and in the polymer spongius support or only in microcapsules, and combined in various ratios such as the released drug ensures the control of post-lesion inflammatory response.

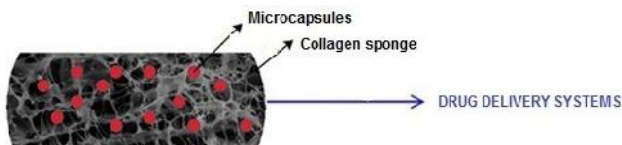
**Description**  
**EN**

The following **advantages** result from the invention:

- the use of multiparticulate systems where flufenamic acid is incorporated in free and encapsulated form, or only in encapsulated form in the polymer matrix respectively, having suitable physicochemical, morphological, biological and biopharmaceutical properties which allow both (i) a biphasic release of the anti-inflammatory drug, reducing the rapid release in the first hours, eliminating the risk of too much drug release before inflammatory process control, and a gradual, slow release over a 48-hour period corresponding to the critical period of a burn, as well as (ii) a gradual degradation of the collagen support;
- a positive effect on the healing process evolution from the first days of medium severity burns experimentally induced by exposure to heat over a longer period of time and experimentally tested on experimental animals.

**Class no.**

4. Medicine - Health Care - Cosmetics



**RO.128.**

**Title EN** INCREASE OF THE INSTITUTIONAL PERFORMANCE AND RDI COMPETENCIES IN THE HEALTH SCIENCES OF "CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST - (SAN-CDCP); CONTRACT NO. PFE\_23/2018

**Authors** Project Coordinator: DINU-PÎRVU Cristina Elena

**Institution** "Carol Davila" University of Medicine and Pharmacy, Bucharest,  
The concept of the project presents itself as an integrative part of the Romanian Research Strategy for supporting the institutional development in terms of increasing, supporting and acquiring the knowhow in emerging and frontier healthcare related research areas.

**Description EN** The specific objectives of the project are:

OP1. Strengthening some of the top, emerging research area in Health Sciences:

- modern, non-invasive and safe performant techniques for early detection of disease risk and progression markers;
- personalization of medicine through patient oriented therapies;
- developing bio-compatible, efficient and safe "intelligent" materials.

OP2. Training of highly qualified specialists in emerging and related research areas

OP3. Integrating the specialists into multidisciplinary excellence research teams

**RO.129.**

**Title EN** **SUPPORTING THE EXCELLENCE RESEARCH IN HEALTH SCIENCES OF "CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST - (MEDEX-II);**

**Authors** Project Coordinator: DINU-PÎRVU Cristina Elena

**Institution** "Carol Davila" University of Medicine and Pharmacy, Bucharest,

**Description EN**

The purpose of the project is to support the excellence research in the field of Health Sciences of the "Carol Davila" University of Medicine and Pharmacy in Bucharest (UMFCD) by providing a functional interface between fundamental, preclinical and clinical research. Achieving the goal is possible by achieving the following goals:

O1 Increasing the complexity of the interdisciplinary researches carried out within the UMFCD by increasing the performance of the human resource involved in the research. This goal will be achieved by (i) increasing the openness of excellence research teams towards an integrated, inter- and transdisciplinary approach in the field of Health, (ii) supporting new excellence networks in the field of Health Sciences that will allow developing new masters/doctoral programs.

O2. Ensuring the well-functioning of the existing research infrastructure by maintenance and upgrade programs of the existing equipment.

O3. Increasing the success rate of research project proposals submitted under different public / private funding programs.

O4. Providing support for capitalizing the excellence research results by (i) supporting publication in ISI quoted journals and (ii) supporting technology transfer and innovation activities.

**Class no.**

**4**

RO.130.

Title EN

**KETOELAST – THE INFLUENCE OF DIETS ON VASCULAR WALL MORPHOLOGY AND FUNCTION IN CHRONIC KIDNEY DISEASE PATIENTS**

Authors

Cristiana DAVID<sup>1,2</sup>, Ileana PERIDE<sup>1,2</sup>, Andrei NICULAE<sup>1,2</sup>, Ionel Alexandru CHECHERIȚĂ<sup>1,2</sup>.

Institution

<sup>1</sup>Department of Nephrology and Dialysis, „Saint John” Emergency Clinical Hospital Bucharest; <sup>2</sup>Clinical Department no 3, „Carol Davila” University of Medicine and Pharmacy Bucharest

Description  
EN

**Background.** It is well documented that chronic kidney disease (CKD) patients have their vessels affected by structural modifications followed by functional disorders, determining high rates of cardiovascular events but also a poor patency for the vascular access for hemodialysis.

The **aim** of this study is to determine in what extent supplemented low/very low protein diets improve some of the vascular wall quality markers (inflammatory and oxidative damage markers, vascular smooth muscle cells transformation percentage) in tissue biopsies of cubital arteries and veins obtained from CKD patients undergoing surgery for vascular access formation.

**Methods.** A prospective 1:1 ratio, case-control study was started, enrolling 80 patients with chronic kidney disease stage 3B and 4, aged 18-80 years and consenting to the study. Two groups were formed: study group (very low protein diet supplemented with ketoanalogues) and control group (low protein diet without supplementation). Actual protein intake will periodically be evaluated according to Maroni formula. Subjects will be monitored until the indication for vascular access creation is made, moment in which they will undergo specific biochemical tests and a minimal vascular wall biopsy during the surgical procedure; immunohistochemical analysis of the vascular wall samples will establish the levels of oxidative stress markers and the percent of VSMC transformation.

**Applications.** The histopathological evidences can contribute to clarify an important nephrology issue. The result will help in choosing the best CKD diet in order to reduce vascular modifications, the rate of cardiovascular events and ameliorate the vascular access patency for CKD patients.

Class no.

4



## „Nicolae Bălcescu” Land Forces Academy Sibiu, Romania

**RO.131.**
**Title EN**

Practical Implementation Of A Uav Technological Product With Vertical Take-Off And Landing Destinated For Reconnaissance Missions In Risk Areas

**Authors**

Razvan Parfenov, Silviu-Mihai Petrisor

**Institution**

Land Forces Academy “Nicolae Balcescu” Sibiu

**Description  
EN**

The research area of the project is that of advanced military technologies. At present, there are many unmanned remote-controlled aircraft systems in the world designed to carry out research missions in risk areas. These are UAVs that have not been designed for vertical take-off and landing ("ScanEagle" or "RQ-11B Raven") and those designed for vertical take-off and landing (CamCopter S-100). Most of the autonomous technologies used in carrying out research missions are small or large UAVs requiring special space for take-off and landing. The possibility of vertical take-off or landing offers an advantage in using them as it does not require a specially arranged space and the liability time is less comparable to the preparation of another type of UAV.

The on-board aircraft I designed is destined to gather information about the enemy in real time, to oversee the raions of interest but also to participate in search and rescue missions. Mainly technical and cost problems are solved by my own drone. First of all, with a vertical take-off and landing system, the idea of using a catapult and recovery system or using a runway within the ScanEagle and RQ-11B Raven UAVs was abandoned. As for energy consumption and coverage of the largest possible rays, the problem encountered at the CamCopter S-100, my prototype solves it by using only three motors. Using only 2 motors for horizontal flight, the load is derived from lift due to forward speed and wings, energy consumption is low, using all three engines only in the landing and take-off phases. Due to the lack of using a special motor for horizontal flight, this problem is solved by a 2-way transition system of the front motors at an angle of 90 degrees to the direction of travel.

As a take-off and landing aircraft, we opted for a three-engine configuration, two of which are on the wings and one on the two carbon pipes. The transition system of the two engines (figure no. 2) has a servomechanism that performs a 90 degree

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movement changing the orientation of the engine.

The strengths of this unmanned aircraft would be:

- Lack of special equipment for take-off and landing, as well as the specially arranged land;
- Low power consumption in horizontal flight mode;
- Fast disassembly for transport
- The weight of the aircraft is relatively low;
- Operating in different types of environment;
- Reduced construction costs of the aircraft;

The prototype (figure no. 1) is in the process of research and development, and it is going to be improved to achieve the missions for which it was designed.



Figure no. 2 – Engine transition system

**University of Agricultural Sciences and Veterinary  
Medicine "Ion Ionescu de la Brad" Iași**

**RO.132.**

**Title EN**

EQUIPMENT FOR AUTOMATICALLY PLANTING  
SEEDLINGS WITH NUTRITIVE POTS  
*PLUG SEEDLINGS CHARACTERISTICS*

**Authors**

*Vlahidis Virgil, Roșca Radu*

**Institution**

The University of Agricultural Sciences and Veterinary  
Medicine Iași

**Patent**

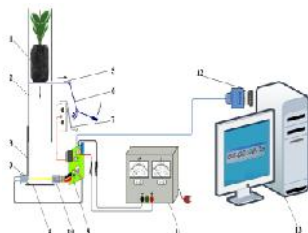
**RO130295 (A0) — 2015-06-30**

**Description  
EN**

The invention relates to an automatic equipment for  
horticulture, intended for transplanting seedlings with  
prefabricated Jiffy pots, in rectilinear rows, for different  
planting schemes, in field and in protected environment.

**Class no.**

Invention Classification: 3



## University of Petrosani

### RO.133.

**Title EN**

**Movement identification and support device for the right arm for persons with mobility problems**

**Authors**

Marius-Nicolae Risteiu, Monica Leba, Andreea Ionica

**Institution**

**University of Petrosani**

**Patent**

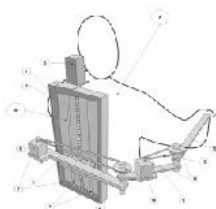
Application No. A/00101/2019

**Description  
EN**

The invention has as objective realization of a device for identifying and supporting the right arm movement for persons with mobility problems. The device is controlled by intentional movements of the muscular tissue that reach the surface and can be measured from the skin. It is useful where the muscle has the movement intention, can move the arm, but does not have enough force to sustain the arm. The designed exoskeleton follows the arm movement and offers support when it is tired.

**Class no.**

4



### RO.134.

**Title EN**

**UNDERGROUND PERSONNEL MONITORING SYSTEM BASED ON VISIBLE LIGHT COMMUNICATION TECHNOLOGY**

**Authors**

Simona Mirela RÎUREAN, Monica LEBA, Andreea Cristina IONICĂ

**Institution**

**University of Petroșani**

**Patent**

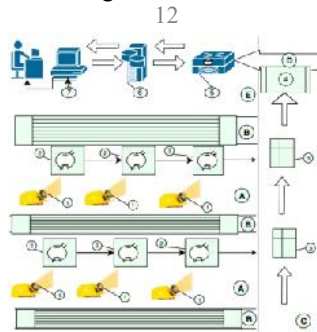
Patent application No. 0491/2018

**Description  
EN**

The underground personnel monitoring system aims to monitor in real time personnel's position in main galleries where the illumination fixture is already setup and to monitor their position on a map in the main surveillance room situated on the mine's surface. Miner's Lamp with VLC embedded (1) has the main role of the wireless data communication transmitter (Tx). Data regarding the lamp's ID are piggy-backed by illumination to the access points (2) with the VLC embedded that act as receivers (Rx). Rx are integrated into the illumination network

already setup on the ceiling of the main galleries into the underground spaces. Data acquired in the main galleries (A) are send through the illumination system to the main shaft (C) where the controllers are situated and then to the surface, at the operating cage room. The server, situated into the monitoring cage room, stores and processes data received from the monitoring cage room through Ethernet network equipment (5). The system allows a safe wireless data communication through visible light in mining underground with potentially explosive environment where RF is forbidden, provides data in real-time regarding the underground location of personnel with the possibility of viewing their position on a digital map, allows the storage in a centralized database of all data on the position of the person at a given moment, the LED code identification are stored in the database according to the bar codes, date, time and location transmitted and allows an easy integration into a centralized system of personnel management.

Class no.



RO.135.

Title EN

**Planning procedure based on an algorithm for optimal task division**

Authors

Ionică Andreea Cristina, Leba Monica, Dovleac Raluca-Anamaria

Institution

**University of Petrosani**

Patent

Patent application No. A/00168/2019

Description

EN

The invention proposed an algorithm which allows automatic task division for development stages with the help of an indicator called Offset, and it is based on an iterative development lifecycle approach. The Offset indicator allows the measurement of customer satisfaction achievement by taking into account aspects such as: the degree to which a task covers a user requirement, interdependencies between tasks, degree of

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task difficulty and so on. Based on this, the algorithm proposes the most optimal outcome for the development period and the tasks required to be completed during the course of this period.

**Class no.**

10

### RO.136.

**Title EN**

MOBILE MARKETING APPLICATION BASED ON  
GAMIFICATION TECHNIQUES

**Authors**

Andreea Cristina IONICĂ, Mihaela ZICA, Monica LEBA,  
Simona Mirela RîUREAN

**Institution**

**University of Petroșani**

**Patent**

Patent application No. 0088/2018

The invention aims to develop an advertising tool to influence consumer's behavior using a dedicated mobile application developed by means of gamification techniques. The last 20 years, mobile marketing has evolved from SMS, then MMS, with image and video content, optimization of mobile endpoint display pages to smartphone / mobile phone applications. For effective communication, advertising has to be personalized with interactive tools. The instrument proposed by this invention eliminates the deficiencies identified in mobile marketing campaigns by using game-specific techniques in order to motivate, involve the consumer in the marketing campaign. By doing so, we influence the behavior of the user in order to clearly define his profile and to provide personalization of the communication with him.

**Description**

**EN**

The proposed instrument uses gamification, which means using game-specific techniques in a mobile marketing context. The consumer is encouraged to use the mobile phone application, thus becoming a promotional actor. In this way, the consumer discovers, explores and promotes a product or service. Within the app, each consumer interacts and competes with others, motivating them to increasingly use the app, to help develop their content as a mobile marketing tool. The consumer makes mobile marketing without any prior training due gamification techniques implemented in the app. A consumer who is a regular, even virtual user, makes a contribution to promoting the product or service and increases the application's database by adding new information about the items he/she explores.

**Class no.**

13

**RO.137.****Title EN****SMART ELECTRIC MOTOR VEHICLE WITH COMMUNICATION SYSTEM AND THE RECOVERY OF A PART OF ELECTRIC POWER CONSUMPTION IN ORDER TO GROW THE AUTONOMY****Authors**

MARCUȘ RĂZVAN-MARCEL, RUS NELUȚU-COSMIN, LEBĂ MONICA

**Institution****UNIVERSITY OF PETROȘANI****Patent**

Patent application No. A00201/28.03.2019

**Description  
EN**

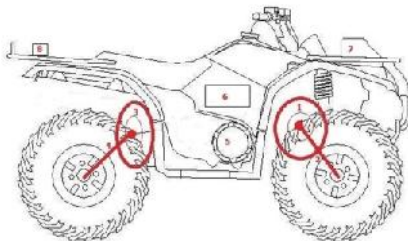
The invention relates to the manufacture of a smart electric vehicle having a function of recovering the energy consumed during the movement by means of gears mounted on the front axle or the rear axle. The front axle gear is made up of a pinion system mounted in the front axle hub that engages with a planetary gear or a direct shaft a designed and built-in generator in its own mode. The rear axle gear is made up of another toothed wheel that is connected to the toothed wheel that transmits power to the wheels. This will allow some of the energy consumed by the vehicle to be recovered at the moment of acceleration and constant speed travel, not just at the moment of braking.

The transfer of energy from the generator to the charging system is done by a wireless system in a closed metal enclosure. In this enclosure there is a coil that is a transmitter and a planar coil as a receiver.

The invention applies the LoRa communication technology in the field of environmental quality monitoring in an urban agglomeration by creating a network of sensors located on the vehicle and communication and control devices.

**Class no.**

8



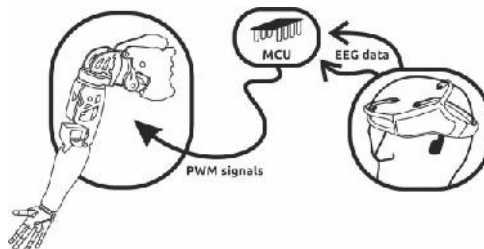
**RO.138.****Title EN****Contributions regarding the use of neural headset for artificial arm control****Authors**

Sebastian-Daniel Rosca, Monica Leba

**Institution****University of Petrosani**

The brain computer-interface (BCI) represents a novelty in technology with major impact in civil, medical and military applications.

In medical field, especially in activities that imply rehabilitation of patients with neurological diseases such as stroke or amputation of upper limb, this technology is able to provide a high level of comfort, safety and freedom based on the unique way of control of medical devices by replacing physical control with direct brain control. Using a series of electrodes placed on the scalp of a user, BCI reproduces conscious thoughts, based on analog to digital conversion of EEG brain signals that can be understood by a computer after a training session over a series of mental tasks. Comparing to the robotic prostheses of the upper limb controlled by non-invasive electromyography sensors, the robotic prostheses controlled through the BCI interface can be adapted to any level of limb amputation and it offers the advantage of long term use due to manufacturing process from semiconductor polymers that don't need glue addition to record electrical signals upon contact with skin. On the other hand, the neural headset used to control the robotic prosthetics offers wireless communication between neural headset and computer to the users, providing freedom of movement for user through Bluetooth module instead of many EMG wired sensors. The BCI applied to upper limb prosthetics can be adapted to work together with other technologies such as augmented reality for psychological treatment to reduce the time necessary to adapt the patient to new life.

**Description****EN****Class no.**

NATIONAL

424



**RO.139.**

<b>Title EN</b>	<b>CONTRIBUTIONS REGARDING THE VISIBLE LIGHT DATA COMMUNICATION APPLICABLE IN INDUSTRY</b>
<b>Authors</b>	Simona Mirela Rîurean, Monica Leba
<b>Institution</b>	<b>University of Petroșani</b>
<b>Description EN</b>	Wireless data communication (WDC) based on radio frequency spectrum (RF) will be increasingly difficult to be expended due to limited global availability. Optical wireless communication (OWC) is an alternative technology that can work as a complementary system to compensate the limited available bandwidth in the RF spectrum. Visible light communication (VLC) as a subclass of OWC, has many advantages such as large available unlicensed bandwidth, inherent security, cost-effectiveness and immunity to electromagnetic interference. Unlike laser-based VLC that requires consideration of eye-safety, LED-based VLC has no restrictions in this regard. Though, the smaller available bandwidth and the low optical power reduces data rates. The wide available off-the-shelf low cost incoherent transmitter and receiver devices makes the intensity modulation and direct detection (IM/DD) technique an efficient and straightforward option for WDC and therefore available to be used in many areas. Industrial environment, though, needs special, adapted design of the VLC setup because of high optical power loss as a consequence of high polluted air, resulting in light absorption and dispersion. Although the low bandwidth of ordinary phosphor-coated white LEDs causes low data rates, there are places where electromagnetic interference is forbidden and therefore the only available wireless data communication is the one based on visible light. Several color LEDs of much larger bandwidths or combination of three or four colors can be utilized to overcome these drawbacks.

**RO.140.**

<b>Title EN</b>	<b>Quality management tools integrated in the project management of IT startups</b>
<b>Authors</b>	Raluca-Anamaria Dovleac, Andreea Cristina Ionica
<b>Institution</b>	<b>University of Petroșani</b>
<b>Description EN</b>	The research is concerned with the topic of quality management and project management approach for IT startups. The need for a startup adapted project management approach has been identified through the help of the study of literature, and the startup requirements in terms of quality management and risk

management have been identified both from literature study as well as real life case studies. Based on this, the author proposed in the course of the research a model/methodology adapted for the project management of IT startups while integrating quality management tools and practices as well.

The advantages of using this model have been tested on real life IT startups and refer mainly, but not only, to: an easy interface for understanding and translating customer needs in technical requirements, automatic task division based on optimizing technical and visible functionality, risk management framework based on fuzzy logic, taking into account the development team capabilities and the nature of the changes desired to be added, etc.

The applicability of the research is in the field of IT startups looking at ways of improving their operations and quality practices, and can be adapted to match the need of product startups or small businesses.

**RO.141.**

**Using Eye-Detection Technology to Mark and Select Elements Integrated into a Graphic Interface in Augmented Reality**

**Title EN**

**Authors**

**Institution**

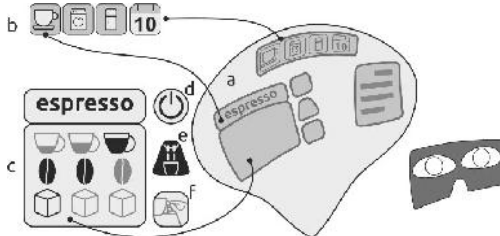
Marius Leonard Olar, Monica Leba

**University of Petroșani**

**Description**

**EN**

In Augmented Reality, the interfaces will be dynamic, will appear or disappear depending on the location or interest of the user, visualization will be done through the semi-transparent screens of intelligent glasses, and control of the graphic elements will be done with the eye-tracking device. The eye tracker will follow the direction in which the user will look, and if there is a graphical element located there in the interface, with eye fixation and a few conscious eye movements, it will be able to mark it and select it. This device will be useful if the user does not have free hands, cannot or doesn't want to move.



**RO.142.****Title EN****Peer to peer muscle memory storage and transmission****Authors**

Arun Fabian Panaite, Monica Leba

**Institution****University of Petroșani**

From the beginning of time, people have wished, if not hoped that somehow, they, or their relatives or friends, could dance or run, or even play a musical instrument, as good as one another, or that their friends, relatives, or even themselves, could recover to full mobility, after an accident, or a form of trauma that have reduced their ability to move in a certain way.

This project envisions one or multiple approaches to read, gather, organize, store and transmit the information from a person's muscle, and later stimulate the muscles of another, for either motion rehabilitation or learning purposes. The dance classes, sports training, or even military drills would become exponentially more effective and not only would time be used in a more efficient manner, but every person could gain high motion performance and control from professional athletes in a timely, accessible, and sensational experience.

**Description****EN**

A prototype of such a system would use EMG (electromyogram) sensors, gyroscope, accelerometer, FES (functional electrical stimulation) and NMES (neuromuscular electrical stimulation) to non-invasively capture the muscle movement from the emitter and stimulate the muscle movement of the receiver, or just store the muscle movement of the emitter, in a computer.



## Politehnica University of Timișoara

### RO.143.

**Title EN**

### INTEGRATED HEAT DEFLECTOR

**Authors**

Corneliu Birtok Băneasă

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.**

Patent – 201000026/30.06.2011

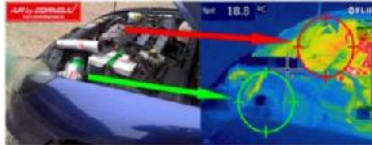
**Description**

EN

The invention relates to an integrated deflector for reducing thermal losses on the intake system of internal combustion engines. The integrated deflector protects the air filter and the intake manifold from the hot air flow and thermal radiation from the cooling radiator, exhaust manifold and engine. In the case of aluminium alloy intake manifolds, it is recommended to implement a multilayer expanded polyethylene thermal deflector or a thermal insulation layer called S.P.T.I. (silicone polyurethane thermo-insulating) which provides protection for the heat solicitation subassemblies.

**Class no.**

8. Aviation, car industry and transportation



### RO.144.

**Title EN**

### THE INVERTED DINAMYC AIR FILTER - YXV Type

**Authors**

Corneliu Birtok Băneasă

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.**

Patent – 125034/30.07.2013

**Description**

EN

The inverted super absorbing filter improves the air filling coefficient of the engine by collecting and inverting the air flux by 180°. It is useful for engines using air filters set in the opposite direction of the flow of the absorbed air. It promotes environmentally friendly cars.

**Class no.**

8. Aviation, car industry and transportation



**RO.145.**

**Title EN** **SUPER-ABSORBING AIR FILTER**

**Authors** Corneliu Birtok Băneasă

**Institution** UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.** Patent – 126019/28.12.2012, Product certificate RAR-OPC 3937/24.10.2012

**Description EN** The invention is a multifunctional air filter, a product designed for filtering the air required for the functioning of the internal combustion engines. According to the invention, the super-absorbing air filter with perforated shell and internal cone for internal combustion engines is designed to increase the volume of the filtered air available for feeding the internal combustion engine.

**Class no.** 8. Aviation, car industry and transportation



**RO.146.**

**Title EN** **DYNAMIC DEVICE FOR AIR TRANSFER**

**Authors** Corneliu Birtok Băneasă

**Institution** UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.** Patent – RO 2009 0002/2009

**Description EN** The dynamic device for air transfer refers to a device designed to transfer air from outside the engine compartment on the classic and sport air filter, to make a laminar, concentrated flow of air and lowering its temperature for increase the volumetric efficiency of internal combustion engine.

**Class no.** 8. Aviation, car industry and transportation



**RO.147.**

**Title EN**

**AIR FILTER FOR INTERNAL COMBUSTION ENGINES**

**Authors**

Corneliu Birtok Băneasă

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.**

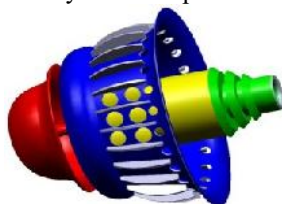
Patent application – US 14/121674; published 04/07/2016

**Description EN**

The super absorbing W air filter is able to capture, accelerate, recover and reverse the flow of air used to form the fuel mixture for internal combustion engines.

**Class no.**

8. Aviation, car industry and transportation



**RO.148.**

**Title EN**

**TUBULAR BRIQUETTE FROM POWDERY FERROUS WASTES**

**Authors**

Hepuț Teodor, Socalici Ana, Ardelean Erika, Ardelean Marius, Constantin Nicolae, Buzduga Miron, Buzduga Radu

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.**

Patent – 126946/30.01.2014

**Description EN**

The technical problem solved by the tubular briquette obtained from powdery ferrous wastes consists in increasing of speed reduction for materials component , with effects on increasing of productivity, reducing of energy consumption and increasing of the reductant use.

**Class no.**

1. Environment - Pollution Control



**RO.149.****Title EN****EXPERIMENTAL PLANT FOR RESISTANCE TO THERMAL FATIGUE****Authors**

Camelia Pinca- Bretotean

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.**

Patent – 126966/30.03.2016

**Description EN**

The invention relates to an experimental plant for laboratory research of thermal fatigue. The facility allows experimental research on thermal fatigue on common metal samples whose section has different shape and sizes. Those samples are approximately equal in size and are mounted tangentially on the generator disk. The facility provides cyclic variations in temperature of samples during intervals ordered according to the samples' material features. It is providing the experimental determination of thermal fatigue on several samples different in shape and size and who are simultaneously subject to different heat stress regimes.

**Class no.**

5. Industrial and laboratory equipments

**RO.150.****Title EN****R.I.M.S. AIR by CORNELIU****Authors**

Corneliu Birtok Băneasă

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

P.h.D. - project

**Description EN**

**R.I.M.S. (resource intake manifolds stand)** experimentally designed for the thermodynamic study of the influence of the intake manifold material on the heat transfer and gas-dynamic process during intake of air into the engine. For this purpose, the stand allows for temperature and pressure measurements at different characteristic points for identical or geometrically different intake manifolds made of various materials (Al alloy, polyamide, fiberglass, carbon fiber, etc.).

**Class no.**

5



**RO.151.**

**Title EN** **DEXTER'S laboratory**

**Authors** Corneliu Birtok Băneasă, Adina Berghian Budiul  
**Institution** UNIVERSITATEA POLITEHNICA TIMIȘOARA  
**Patent no.** -

**Description EN**

Creative projects, teaching materials, experimental stands for the construction of road vehicles designed and made by students, teenagers, students for the laboratory study.

The idea is to transform the theoretical knowledge into practical applications through the creation of personalized projects destined to the study of the functioning principles of the componets, mecanism and the systems of vehicles.

**Class no.**

14. Other



**RO.152.**

**Title EN** **MicroU**

**Authors** Corneliu Birtok Băneasă  
**Institution** UNIVERSITATEA POLITEHNICA TIMIȘOARA  
**Patent no.** -

**Description EN**

MicroU, an ecological and multifunctional alternative to glasses pouch, with a protective and cleaning function, without resorting to wet napkins. Technical Problem Solved by MicroU: multifunctional capacity (protection and cleaning), eliminates the use of wet napkins, small dimensions (thickness 3mm, weight 30g), duration of use 5-10 years, washable (wash easily).



The MicroU has a wide range of use and can be used successfully for cameras, smartphones, tablets, laptops, ebook readers, etc.

**Class no.** 1. Environment - Pollution Control



**RO.153.**

**Title EN**

**BirCor**

**Authors**

Corneliu Birtok Băneasă

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

**Patent no.**

-

**Description  
EN**

BircoR is a soap support made of natural materials (stone) of different shapes and sizes. Placing the soap on the BircoR support is a challenge in order to achieve the static and dynamic balance. This action disconnects us from the hyper-alert rhythm of everyday life, leading to biorhythm regulation. BircoR: reduces stress, improves dexterity, brings us closer to nature.

**Class no.**

1. Environment - Pollution Control



**RO.154.**

**Title EN**

**PROCESS FOR THE  
SYNTHESIS OF SILVER NANOWIRES COATED WITH  
LOW-MELTING-POINT METAL NANOPARTICLES**

**Authors**

Bănică Radu Nicolae, Kellenberger Andrea Rozalia, Ursu Daniel Horațiu, Cseh Liliana, Linul Petrică Andrei, Vaszilcsin Nicolae

**Institution**

UNIVERSITATEA POLITEHNICA TIMIȘOARA

NATIONAL

## EUROINVENT 2019

**Patent no.**

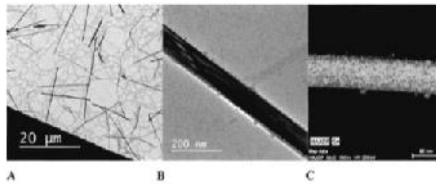
Patent application A 2016 00732/14.10.2016

**Description**  
**EN**

The invention relates to a process for the synthesis of silver nanowires coated with low-melting-point metal nanoparticles, meant to be used as electroconductive tracks on flexible electrical insulator supports, with applicability in the construction of solar cells and optoelectronic devices, such as: flexible mobile phones, smart windows that modify their transparency when applying an electrical voltage, highly efficient thermal heaters for electronic components, smart clothing employing the Joule-heating effect, etc..

**Class no.**

2



**National Institute of Materials Physics**  
Magurele, Romania

**RO.155.**

<b>Title EN</b>	<b>Installation for obtaining substrates of fibrils from biopolymers through electrospinning</b>
<b>Authors</b>	Mihai Cioca, Gabriel Dobrescu, Adelina Ighigeanu, Alexandru Evanghelidis, Elena Matei, Ionut Enculescu
<b>Institution</b>	<b>National Institute of Materials Physics</b>
<b>Patent no.</b>	U00037/24.08.2019
<b>Description EN</b>	The invention relates to (i)- a method of processing a superconducting tape or wire with a lightweight metal sheath and a MgB <sub>2</sub> core and to (ii)- the tape / wire thus obtained. According to the invention, the method of processing combines plastic deformation and spark plasma sintering (SPS) using an arrangement with a hexagonal boron nitride powder, h-BN, in which the wires / bands are immersed, in vacuum, being subjected a heat treatment with a heating rate of 100 ° C/min at a pressure of 95 MPa, and at a maximum temperature of 1150 °C maintained for 3 minutes.
<b>Class no.</b>	2

**RO.156.**

<b>Title</b>	<b>Mesoporous layer for perovskite solar cells and the fabrication method</b>
<b>Authors</b>	Ioana Pintilie, Andrei-Gabriel Tomulescu, Lucia Nicoleta Leonat, Viorica Stancu, Cristina Besleaga Stan, Vasilica Toma, Viorel-Georgel Dumitru, Lucian Pintilie
<b>Institution</b>	National Institute of Materials Physics, P.O.Box MG-7, Magurele, Bucharest
<b>Patent no.</b>	RO-BOPI 9/2018, din 28.09.2018, 132082 A3
<b>Description EN</b>	The invention relates to a thin mesoporous oxide layer with a rough reticulated structure which presents characteristic morphology and its method of production. The technique involves spraying a suspension of oxide nanoparticles using a pressurized carrier gas on a heated substrate, thus the rough reticulated structure is being obtained. The special features obtained by this method have dimensions ranging from 37 to 1.9 µm in diameter and 1.3 - 0.2 µm in depth. These dimensions can be controlled by varying the deposition parameters of the method during

fabrication.

Obtaining mesoporous layers with a reticulated structure, especially for perovskite-based solar cells and in the medical field, applicable to the industrial scale, for the production of large-area solar cells (1 cm<sup>2</sup>) with the possibility of industrial expansion

**Class no.** 2

### RO.157.

**Title EN**

**Process for obtaining one-dimensional zinc oxide nanostructures by the thermal oxidation of zinc foils**

**Authors**

C. Florica, N. Preda, A. Costas, A. Evanghelidis, M. Oancea, M. Enculescu, E. Matei, I. Enculescu

**Institution**

National Institute of Materials Physics, P.O.Box MG-7, Magurele, Bucharest

**Patent**

RO131555B1

**Description  
EN**

The invention describes a process for obtaining one-dimensional zinc oxide nanostructures on the surface of zinc foils by thermal oxidation in air for 12 hours, at temperatures of 400 ° C, 500 ° C and 600 ° C using a convection oven. The density and the sizes of the one-dimensional metal oxides nanostructures on the metallic surface are controlled by temperature. The wetting properties (superhydrophobicity and the low water droplet adhesion) of the one-dimensional ZnO nanostructures reveal the possibility of applying the process for coating metal surfaces with such metal oxide nanostructures for applications in self-cleaning surfaces area.

Scope of application: nanomaterials, surfaces with special wetting properties (superhydrophobicity, self-cleaning)

**Class no.** 7

### RO.158.

**Title EN**

**Process for obtaining a photodetector based on nanofire matrixes of copper-zinc oxide-zinc oxide core made of interdigitated metallic electrodes**

**Authors**

A. Costas, C. Florica, N. Preda, A. Evanghelidis, C. Besleaga, M. Beregoi, M. Enculescu, E. Matei, V. Diculescu, A. Enache, M. Ignat-Barsan, M. Onea, A. Aldea, M. Apostol, M. Bunea, D. Crisan, O. Constantinescu, I. Enculescu,

**Institution**

National Institute of Materials Physics, P.O.Box MG-7,

Magurele, Bucharest

**Patent no.** A/00439/2018  
The invention describes a process for obtaining a photodetector based on CuO-ZnO core-shell nanowire arrays grown on Si/SiO<sub>2</sub> substrates patterned with Ti/Pt/Cu metallic interdigitated electrodes, the electrodes being fabricated by photolithography and electrodeposition and the CuO-ZnO core-shell nanowire arrays by thermal oxidation of a Cu film and magnetron sputtering deposition of ZnO films at various times (7 minutes, 15 minutes and 30 minutes). Electrical measurements in dark and under illumination at different wavelengths reveal the possibility of applying the CuO-ZnO core-shell nanowire arrays for the development of UV and near-infrared photodetectors.

**Class no.** 2

**RO.159.**

**Title EN** Procedure for obtaining doped LYF4 luminophores with rare earths (Yb, Er) with luminescent properties under the influence of infrared radiation

**Authors** Mihail Secu, Corina-Elisabeta Secu

**Institution** National Institute of Materials Physics, P.O.Box MG-7, Magurele, Bucharest

**Patent no.** -

**Description EN** The present invention presents a new synthesis method for the infrared sensitive Yb<sub>3+(4%)/Er<sub>3+(1%)</sub>-doped LiYF<sub>4</sub> nanocrystalline powder phosphor. In the first step an homogenous and uniform mixture LiF and YF<sub>3</sub> nanocrystals is simultaneously obtained by precipitation reaction mediated by the ethylene glycol solvent. Then, the precipitate is separated and dried and solid state reaction between the nanofluorides is accomplished during the calcination at 500oC with the formation of the Yb<sub>3+(4%)/Er<sub>3+(1%)</sub>-doped LiYF<sub>4</sub> powder phosphor. The synthesis method is relatively simple because is performed in open atmosphere at room temperature, it assures the control of the composition and characteristic luminescence of the final compound. Applicability: Anti-Stokes fluorescent inks for document securing, solar photovoltaic cells, medical imaging.</sub></sub>

**Class no.** 4

**RO.160.**

<b>Title EN</b>	<b>Capacitive matrix for non-volatile memory based on germanium nanocrystals immersed in hafnium dioxide and process for making it</b>
<b>Authors</b>	A. Slav, C. Palade, A.-M. Lepadatu, S. Lazanu, M.L. Ciurea, D. Vasilache, M. Dragoman – IMT Bucuresti
<b>Institution</b>	National Institute of Materials Physics, IMT Bucharest
<b>Patent no.</b>	<b>131968 B1</b>
<b>Description EN</b>	The present patent is related to a capacitive matrix for non-volatile memory formed by parallel-connected metal-oxide-semiconductor capacitor cells and to the process for making it. Each capacitor has a trilayer structure, namely <i>control HfO<sub>2</sub>/ intermediate layer with Ge nanocrystals in HfO<sub>2</sub>/ tunnel HfO<sub>2</sub> / Si substrate</i> . The intermediate layer is the floating gate and HfO <sub>2</sub> tunnel layer allows nanocrystal charging with charge carriers from the substrate, by tunneling. Field of application: Non-volatile memories, microelectronics
<b>Class no.</b>	10

**RO.161.**

<b>Title EN</b>	<b>Powders, sintered bodies and MgB<sub>2</sub> coatings resistant to microbial colonization and microbial biofilm efficacy and method of its use</b>
<b>Authors</b>	Petre Bădică, Dan Nicolae Batalu, Mihai Alexandru Grigoroșcută, Mihail Burdușel, Gheorghe Virgil Aldica, Marcela Popa, Mariana Carmen Chifiriuc
<b>Institution</b>	National Institute of Materials Physics, P.O.Box MG-7, Magurele, Bucharest
<b>Patent no.</b>	A/01129 registered on 20.12.2018
<b>Description EN</b>	The present invention relates to the use of powders, bulk samples and coatings based on MgB <sub>2</sub> as resistant materials to microbial colonization and the development of microorganisms of biofilms. The material has a high efficiency against biofilms of <i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> and <i>Candida albicans</i> . <b>Applicability:</b> Biomedical field or in sau în aplicații eco-industrial applications in which preventing surface degradation caused by microbial action in necessary
<b>Class no.</b>	4

**RO.162.**

**Title EN**      **Development of DEMO divertor components with embedded functionally graded thermal barriers**

**Authors**      Magdalena Galatanu, Mihai Cioca, Adelina Ighigeanu, George Ruiu, Monica Enculescu, Bogdan Popescu, Andrei Galatanu

**Institution**      National Institute of Materials Physics, P.O.Box MG-7, Magurele, Bucharest

**Description EN**      In the case of DEMO fusion reactor, the divertor should be able to extract a steady heat flux of up to 10-20 MW/m<sup>2</sup> under at least 5 dpa neutron irradiation. For the best performance of its materials (W and Cu alloys) we have developed a technology able to produce monoblocks with an embedded functionally graded “thermal barrier” material which controls the heat flow through the component and mitigates in the same time the stresses generated by thermal expansion coefficients’ mismatch.

**Class no.**      7

**National Research&Development Institute for Chemistry  
and Petrochemistry - ICECHIM Bucharest**

**RO.163.**

<b>Title</b>	<b>Antifungal, anti-wear, anti-slipping and photochemical stable used in museums and storage / conservation areas of cultural heritage artifacts and procedure for implementation</b>
<b>Authors</b>	Ion Rodica Mariana, Marin Laurentiu, Ion Nelu
<b>Institution</b>	ICECHIM, Bucharest
<b>Patent no.</b>	Patent application No. A 00111/2019
<b>Description</b>	The invention presents a composite with antifungal, anti-wear, anti-slip and photochemical stable based on polyurethane and carborundum, and a compound with antibacterial action of the hydroxyapatite type and the process of obtaining. The obtaining process of the invention consists in dissolving the resin in a toluene: 2-methyl-1-ol solvent followed by homogenization of the polymeric material, carborundum and hydroxyapatite by continuous and vigorous stirring at a rotational speed, diisocyanate being added dropwise. <i>Acknowledgements:</i> This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0476 / 51PCCDI/2018, within PNCDI III”.
<b>Class</b>	7 - Buildings and Materials

**RO.164.**

<b>Title</b>	<b>Polymeric compositions for the protection and conservation of wood surfaces and procedure for the application of them</b>
<b>Authors</b>	Ion Rodica Mariana, Grigorescu Ramona Marina, Iancu Lorena, Ghioca Paul Niculae, Ion Nelu
<b>Institution</b>	ICECHIM, Bucharest
<b>Patent no.</b>	Patent application A 2018 - 00319/2018
<b>Description</b>	The present invention relates to the a polymeric compositions used as wood degradation coating and degradation agents applied to the surface of wood affected by degradation due to the long-term action of external factors such as temperature, light or pollutants as follows: a poly (styrene-ethylene-butylene-styrene) block copolymer (SEBS) grafted with maleic anhydride (MA) in combination with



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toluene applied to the wood surface by spraying or polishing and a poly (styrene-ethylene-butylene) (SEBS) grafted with maleic anhydride (MA) in admixture with ZnO for spraying / spreading wood surfaces on these pretreated surfaces with a suspension of ZnO in isopropyl alcohol.

*Acknowledgements:* This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0476 / 51PCCDI/2018, within PNCDI III”.

**Class** 9. Chemical and Textile Industry

### RO.165.

**Title** **Antifungal composition for restoration / preservation of wood artifacts, and method of use**

**Authors** Ion Rodica Mariana, Ion Nelu, Iancu Lorena, Radu Nicoleta

**Institution** ICECHIM, Bucharest

**Patent** Patent application No. A 00054/2019

**Description** The present invention relates to an inorganic silver-based hydroxyapatite based on silver hydroxyapatite generated from hydroxyapatite and silver nitrate in the presence of wood pulp, used for the treatment of fungal wood, keeping the chromatic characteristics and improving its mechanical properties.

*Acknowledgements:* This work was supported by a grant of the MCI- UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0476 / 51PCCDI/2018, within PNCDI III”.

**Class** 7

### RO.166.

**Title** **Composition and process for cleaning and consolidating architectural elements of heritage buildings**

**Authors** Ion Rodica Mariana, Ion Nelu

**Institution** ICECHIM, Bucharest

**Patent** **Patent No. RO 1317330A0**

**Description** The invention relates to a composition and to a process for cleaning and consolidating deteriorated decorative elements, such as stucco works and facade elements, during reconstructing the initial appearance of these elements. According to the invention, the composition comprises: titanium dioxide, hydroxyapatite, phyllosilicate mineral clay, homogenized by stirring, after which it is added into distilled

water while stirring at the room temperature, until a paste is obtained. As claimed by the invention, the process consists in mechanically de-dusting the surface to be reconditioned, with a soft brush, under low ventilation, removing the wax deposits with the seaming tool, applying, with a brush or a putty knife, a layer of 0.2 mm, by two applications, followed by drying in air for 12 hours.

*Acknowledgements:* This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0476 / 51PCCDI/2018, within PNCDI III”.

**Class** 7 - Buildings and Materials

### RO.167.

**Title** **Recycling method of the polystyrene fraction from waste electrical and electronic equipment as impact-strength polystyrene composite**

**Authors** R.M. Grigorescu, P.N. Ghioca, L. Iancu, Z. Vuluga, M. Iorga, R.M. Ion, N. Ion, M.E. Grigore, R.E. Andrei, M.I. Filipescu, G.I. Radu, B.N. Spurcaciu

**Institution** ICECHIM, Bucharest

**Patent** **Patent Application No.** 00075/06.02.2019

**Description** The invention refers to the recycling of the polystyrene fraction separated from waste electrical and electronic equipment as impact-strength polystyrene composite using a mixture of a styrene-butadiene block-copolymer (SBS) - as impact modifier and a maleinized and hydrogenated styrene-butadiene block-copolymer (SEBS-g-MAH) - especially as compatibilizer of polyolefin impurities and other polar compounds with the polystyrene continuous phase. This leads to an increase of the tensile strength and elongation at break of the composite that could be used in the automotive industry, civil engineering. The process removes the disadvantage of the high costs required for the advanced separation of polystyrene copolymers.

*Acknowledgements:* This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III- 84PCCDI/2018, within PNCDI III”.

**Class** 1 – Environment – Pollution Control

**RO.168.**

<b>Title</b>	<b>Nanomodified with layered aluminosilicate bentonite type Polyetherpolyol type PETOL 36 3 BR</b>
<b>Authors</b>	Marin Laurentiu
<b>Institution</b>	<b>National Institute for Research and Development in Chemistry and Petrochemistry – ICECHIM Bucharest</b>
<b>Patent</b>	Patent application No. A/00179/2017
<b>Description</b>	The invention relates to a modified with bentonite-type aluminosilicate at nanometric level PETOL 36 3 BR type polyetherpolyol, with molecular weight 5000 UAM. The polyether so modified is subsequently used in a polyaddition reaction with a diisocyanate, to obtain a polyurethane nanocomposite. In a laboratory vessel a 1/1 bentonite / polyether suspension is obtained. After the mixture homogenization, well-established portions are taken to be mixed at their turn, with pure polyetherpolyol, so as to obtain mixtures containing it 2, 4, 6, 10 % gravimetric parts bentonite-type aluminosilicate dispersed at nanometric level in polyetherpolyol. After heating at 60 degrees ° C and stirring for 6 hours under vigorous stirring of 200 rot / min. the mixtures are allowed to stand for 48 hours. After removing the solid deposit where it exists, following the calculations made, it is ascertained that polyetherpolyol can encompass at the molecular level up to 6% gravimetric parts bentonite-type aluminosilicate. The nanomodification of the polyetherpolyol does not lead to the modification of the polyaddition reaction parameters or its stoichiometry.
<b>Class</b>	9

**RO.169.**

<b>Title</b>	<b>NEW DIAGNOSIS AND TREATMENT TECHNOLOGIES FOR THE CONSERVATION AND REVITALIZATION OF ARCHAEOLOGICAL COMPONENTS FROM NATIONAL CULTURAL HERITAGE</b>
<b>Authors</b>	Ion Rodica Mariana <sup>1</sup> , Turcanu-Carutiu Daniela <sup>2</sup> , Predoana Luminita <sup>3</sup> , Radulescu Cristiana <sup>4</sup>
<b>Institution</b>	1 - ICECHIM, Bucharest; 2 – Ovidius University, Constanta, 3- Institutul de Chimie Fizica “Ilie Murgulescu”, Bucharest; 4 – Valahia University, Targoviste
<b>Patent</b>	<b>PNIII 51/2018</b>

**Description**

The cultural heritage, as a source of national historical and cultural authenticity, is subjected to deterioration, and for stopping it, some specific procedures are required: cleaning, replacement of old materials and application of new protective materials compatible with the original, and advanced monitoring with sustainability assessment. The consortium of the present project has a unique expertise in Romania, recognized in Europe, through the many published papers, essential projects in Romania (Basarabi Churches, Potlogi Palace, etc.), OSIM and EPO patents, technology transfer, nanomaterials in chemical and biological preservation for cultural heritage objects and objectives; the partner institutions complement each other on a regional basis in the working plan of the whole project. The overall objective of the project is to develop new materials, new methods and technologies that obey the principles of authenticity, reversibility and value, with a strong impact on immobile cultural heritage objects (fresco, bas-reliefs and mosaic) and mobile (decorative artefacts from ceramics, glass, metal, bone, objects of art and archaeology). Specific objectives: Developing innovative technologies for protecting national cultural heritage, multidisciplinary cross-sectoral approach, encouraging young professionals as leaders in heritage preservation, exploitation of research results for new jobs, promoting heritage education, professional expertise among all factors involved in the patrimony protection system. The project, with a high degree of innovation and originality, applies unique technologies in Romania based on new materials compatible with the original materials and develops new techniques practical applied to: Roman Mosaic and Hypogeum Tomb, Constanta, Adamelisi Museum (bas-reliefs), Constanta County, Corvin's Castle (Fresca Loggia Mathia), Hunedoara.

*Acknowledgements:* This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0476 / 51PCCDI/2018, within PNCDI III”.

**Class**

7

**RO.170.**

<b>Title</b>	<b>Antimicrobial gluing agent for the restoration of paper-based artefacts belonging to the cultural heritage and the method of obtaining it</b>
<b>Authors</b>	Alexandru Stirban <sup>1</sup> , Radu Claudiu Fierascu <sup>2</sup> , Irina Fierascu <sup>2</sup> , Petronela Fotea <sup>2</sup> , Alina-Ruxandra-Eugenia Ortan <sup>3</sup> , Maria-Similia Zgarciu <sup>1</sup> , Ioan Constantin Inel <sup>1</sup>
<b>Institution</b>	<sup>1</sup> National Museum of Unification Alba Iulia (MNUAI), <sup>2</sup> The National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest, <sup>3</sup> University of Agronomic Sciences and Veterinary Medicine of Bucharest
<b>Patent</b>	Patent application A/00915/20.11.2018
<b>Description</b>	<p>The degradation of heritage objects has complex causes and may even sometimes irreversibly affect these works. Biodegradation is the effect of the metabolic activity of living organisms that find optimal conditions for development on the support material. In the case of paper objects, mainly composed of cellulose and other derived materials (lignin, hemicellulose, pectin, resins, tannins, proteins and minerals), the support is an environment favorable to the development of microorganisms that affect both their consistency and their aesthetic aspect.</p> <p>The present invention relates to an adhesive agent based on carboxymethylcellulose and enriched with an antimicrobial mixture for the preservation / restoration of paper -based heritage artefacts.</p> <p><b>Acknowledgements:</b> This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0413, contract 50 PCCDI/2018, within PNCDI III.</p>
<b>Class</b>	14

**RO.171.**

<b>Title</b>	<b>Ecological antifungal composition for controlling phytopathogenic strains affecting the grapevine and method of obtaining it</b>
<b>Authors</b>	Irina Fierascu <sup>1</sup> , Radu Claudiu Fierascu <sup>1</sup> , Toma Fistos <sup>1</sup> , Liliana Cristina Soare <sup>2</sup> , Camelia Ungureanu <sup>3</sup> , Diana Vizitiu <sup>4</sup> , Oana Alexandra Draghiceanu <sup>2</sup> , Alina Paunescu <sup>2</sup>

<b>Institution</b>	<sup>1</sup> The National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest, <sup>2</sup> University of Pitesti, <sup>3</sup> University Politehnica of Bucharest, <sup>4</sup> The National Research and Development Institute for Biotechnologies in Horticulture Stefanesti
<b>Patent</b>	Patent application A00158/12.03.2019 There are known numerous plant diseases caused by pathogens such as fungi, molds, oomycete, bacteria and viruses. Many of them, usually linked to climate conditions that favor their onset and diffusion, have dramatic consequences, resulting in crop yield losses that may have a profound and sometimes catastrophic impact on the agricultural economy, especially when the disease assumes an epidemic status.
<b>Description</b>	The present invention relates to an ecological composition for controlling pathogenic strains affecting vines ( <i>Plasmopara viticola</i> (Berk. & MA Curtis) Berl. & De Toni, (1888), responsible for the appearance of vines mildew), based on phytosynthesized silver nanoparticles using natural extracts from spontaneous flora. This ecological composition to control pathogenic strains affecting grapevine crops uses non-toxic solvents, has no adverse effects, is cheap, and has no negative effect on the environment and human health.
	Acknowledgements This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0332, contract 6 PCCDI/2018, within PNCDI III.
<b>Class</b>	3
<b>RO.172.</b>	
<b>Title</b>	<b>Adhesive material with antimicrobial properties for the restoration of ceramic artifacts belonging to the cultural heritage and method of obtaining it</b>
<b>Authors</b>	Radu Claudiu Fierascu <sup>1</sup> , Irina Fierascu <sup>1</sup> , Petronela Fotea <sup>1</sup> , Alina-Ruxandra-Eugenia Ortan <sup>2</sup> , Ioana Popitui <sup>3</sup> , Mihaela Beceanu <sup>3</sup>
<b>Institution</b>	<sup>1</sup> The National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest, <sup>2</sup> University of Agronomic Sciences and Veterinary

	<b>Medicine of Bucharest, <sup>3</sup>Museum of Dacian and Roman Civilization</b>
<b>Patent</b>	Patent application A/00914/20.11.2018 For heritage objects only adhesives that comply with the general principles of scientific restoration are used. In the restoration process only materials similar to the originals or, if this is not possible, materials with physico-mechanical properties as close as possible to the original materials are used.
<b>Description</b>	To comply with the rules and principles of restoration and low toxicity materials, the present invention relates to an antimicrobial adhesive material comprising on a polyvinyl-adhesive enriched with an antimicrobial mixture, for the restoration of clay cultural heritage artifacts, and other silica-based materials. Acknowledgements This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0413, contract 50 PCCDI/2018, within PNCDI III.
<b>Class</b>	14
<b>RO.173.</b>	
<b>Title</b>	<b>Ecological antifungal solution for controlling phytopathogenic strains affecting apple crops and method of obtaining it</b>
<b>Authors</b>	Cristina Liliana Soare <sup>1</sup> , Irina Fierascu <sup>2</sup> , Radu Claudiu Fierascu <sup>2</sup> , Camelia Ungureanu <sup>3</sup> , Mirela Florina Calinescu <sup>4</sup> , Codruta Mihaela Dobrescu <sup>1</sup> , Anca Nicoleta Sutan <sup>1</sup>
<b>Institution</b>	<sup>1</sup> University of Pitesti, <sup>2</sup> The National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest, <sup>3</sup> University Politehnica of Bucharest, <sup>4</sup> Research Institute for Fruit Growing Pitesti - Maracineni
<b>Description</b>	Patent application A00159/12.03.2019 In the last period, diseases that occur in fruit trees (apple, pear, peach, apricot, etc.) are more frequent, but also very virulent. Explanations would be climate change in many areas, which leads to increased precipitation, humidity and wind direction, as well as excessive or unilateral application of nitrogen fertilizers. Also, the resistance of pathogenic
<b>Class</b>	

germs to the multitude of synthetic treatments is a cause to be considered. The use of synthetic agents is limited by the known resistance phenomenon, as well as the toxic effects that can be induced in humans and animals and their pollution potential to the environment.

The present invention relates to an ecological solution for controlling the pathogenic strains affecting apple crops (*Podosphaera leucotricha* (Ellis & Everh.) E.S. Salmon, (1900) responsible for the milling, respectively *Venturia inaequalis* (Cooke) G. Winter (1875), the responsible microorganism for the occurrence of rape), based on natural extracts obtained using spontaneous flora. This solution uses inexpensive materials that can be harvested from indigenous flora, does not require toxic and / or dangerous substances and solvents, and has no negative effect on the environment and human health.

#### Acknowledgements

This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0332, contract 6 PCCDI/2018, within PNCDI III.

#### RO.174.

**Title** **Process for the synthesis of surfactants based on hydrolyzed proteins from collagen and detergent or cosmetic compositions containing them**

**Authors** Vărășteanu Dana Simona, Irina Elena Chican

**Institution** **The National Research & Development Institute for Chemistry and Petrochemistry – ICECHIM Bucharest**

**Patent** Patent application No. A/01061/8.12.2017

**Description** The invention relates to a process for the synthesis of surfactants based on hydrolyzed proteins from collagen, using raw materials from renewable resources and avoiding the use of toxic solvents. The products have a high biodegradability and provide good skin compatibility to the detergent or cosmetic compositions containing them. Collagen hydrolyzate-based surfactants exhibit high foaming power and have a high efficiency in reducing superficial water tension at critical micellar concentration.



RO.175.

<b>Title</b>	<b>Contingency of CBRN hazards and improvement of national security resources SECURE-NET</b>
<b>Authors</b>	Tanta-Verona IORDACHE, Claudiu LAZAROAIE, Traian ROTARIU, Adriana JERCA, Adi GHEBAUR, George SURDU, Irina CHICAN, Ana-Mihaela FLOREA, Valentin RADITOIU, Emeric BARTHA
<b>Institution</b>	<b>Coordinator:</b> <b>The National Research and Development Institute for Chemistry and Petrochemistry ICECHIM</b> <b>Partners:</b> Ministry of National Defense through the Scientific Research Center for CBRN Defense and Ecology, Military Technical Academy, Politehnica University of Bucharest, Organic Chemistry Centre of the Romanian Academy "C.D.Nenitescu", Scientific Research Center for the Naval Forces Constanta
<b>Description</b>	SECURE-NET is a Complex Project designed to improve the institutional performance of Institutions with Re-launch Capabilities in the Field of National Security. In this respect, the Complex Project proposes five research themes corresponding to five Component Projects, which aim at: (i) contingency of chemical, biochemical, radiological and nuclear (CBRN) hazards by developing new decontamination products and unique specific sensors for detecting chemical agents of combat, and (ii) improving national security by developing innovative wave shock-absorbing composites, performant solid rocket fuels and novel multispectral camouflages. This Complex Project brings together institutions with tradition, having either similar or complementary specialization, to strengthen scientific and technical competences in the field of National Security and Advanced Materials for military applications. In addition, the project facilitates the transfer of scientific knowledge between participating institutions as well as the recruitment and training of new staff. The multitude of results generated by the implementation of SECURE-NET express the potential for significant influence upon (i) the scientific community through communication and dissemination of results (as a short- and medium-term impact), and (ii) the public and private

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environment by promoting new research services and new transferable products / technologies to the external environment of the Consortium, particularly to the national defense industry (as a long-term impact).



**Class**

**SECURE-NET Objectives and Results**

**National Institute for Research and Development in  
Electrical Engineering ICPE-CA Bucharest**

**RO.176.**

**Title** Double-acting, solid, ecological agent, foam and corrosion inhibitor, for extraction wells and manufacturing process  
*LINGVAY Iosif, CĂPĂȚINĂ MITROIU Nicolae,*

**Authors** *MOSCALIUC Hermina Gabriela, OPRINA Gabriela, RADU Lăcrămioara Elena, VOINA Andreea*

**Institution** National Institute for R&D in Electrical Engineering  
ICPE-CA (INCDIE ICPE-CA)

**Patent no.** Patent application No. A / 00018 / 2016

The technical problem solved by the invention consists in obtaining, exclusively from natural and renewable products, a solid, nontoxic and readily biodegradable water treatment agent with controlled solubilization and with a double effect, namely: on the one hand, agent ( $1 \div 200\text{g} / \text{l}$ ), pH ( $2 \div 11.5$ ) and temperature ( $30 \div 70^\circ\text{C}$ ) of treated waters, and on the other hand, corrosion inhibitor with corrosion inhibiting efficiency of carbon steel over 80%.

**Description** According to the invention, the process for producing the solid foamer and the corrosion inhibitor is environmentally friendly, requires the use of only natural renewable products, does not generate waste, the by-products are fully recoverable - the solid fractions resulting from the filtration of the vegetable residues (cake) at animal feed, solid fractions resulting from ash residue filtration at soil fertilization, and liquid fractions are recirculated in the manufacturing stream.

**Applications:** extracting natural gas at an advanced stage of exhaustion

**Class**

1

**RO.177.**

**Title** **Optically transparent grid-type electromagnetic shield obtained by 3D printing**

**Authors** Mihai Bădic, Cristian Morari, Dragoș Ovezza

**Institution** National Institute for R&D in Electrical Engineering  
ICPE-CA (INCDIE ICPE-CA)

**Patent no.** Patent application No. A/00323/2017

**Description** This invention refers to a grid-type optically and aerodynamically transparent electromagnetic shield obtained

through three-dimensional printing.

The grid-type optically and aerodynamically transparent electromagnetic shield consist in a base structure made from plastic by using 3D printing technology, and a metal material coating with a 10-100  $\mu\text{m}$  thickness, subsequently applied, which fulfils the electromagnetic shielding function. Depending on the diameter and length of apertures in the grid, values of over 100 dB are achieved for electromagnetic shielding effectiveness at frequencies up to 100 GHz. Thus, the theoretical calculus indicate that for apertures with 1.75 mm in diameter and 6.56 mm in length, an electromagnetic shielding effectiveness of 120 dB is obtained and a maximum shielded frequency of 100 GHz. Due to the 3D printing technology, electromagnetic shielding ventilation panels in any shape can be obtained. The transparency on light radiation exceeds 35% at normal incidence.

Applications: in the domain of electromagnetic compatibility for making shielded enclosures, anechoic chambers, etc.

**Class** 5

**RO.178.**

**Title** **Multilayer electrospun membrane and process for obtaining the same**

**Authors** Banciu Cristina Antonela, Bara Adela, Chitanu Elena, Marinescu Virgil Emanuel

**Institution** **National Institute for Research and Development in Electrical Engineering ICPE-CA**

**Patent no.** Patent application No. A00905/2017

**Description** The invention relates to a multilayer membrane for water filtration processes and to a process for obtaining the same. The membrane consists of three successive layers: a gauze textile substrate having the role of mechanical support, a layer of expanded polystyrene electrospun fibers and a top layer of polyacrylonitrile electrospun fibers having the BET surface area of 20...50  $\text{m}^2/\text{g}$ , pore size of 3...9  $\mu\text{m}$ , tensile strength of 1...5 MPa and a modulus of elasticity of 0.04...0.18 GPa. The process consists in the preparation of polymer solutions of expanded polystyrene and polyacrylonitrile in dimethylformamide, electrospinning of the prepared solutions and drying the resulting multilayer electrospun membrane, at room temperature, under ventilation, for 4...6 hours.

Applications: The multilayer electrospun membrane could be used for water filtration processes.

**Class** 1

NATIONAL

**RO.179.**

<b>Title</b>	<b>Electrospun membrane based on expanded polystyrene with cyclodextrin additive and process for obtaining the same</b>
<b>Authors</b>	Banciu Cristina Antonela, Bara Adela, Chitanu Elena, Lungulescu Eduard-Marius, Ion Ioana
<b>Institution</b>	<b>National Institute for Research and Development in Electrical Engineering ICPE-CA</b>
<b>Patnet</b>	Patent application No. A00868/2017
<b>Description</b>	<p>The invention relates to an electrospun polystyrene membrane for the filtration processes and to a process for obtaining the same. The membrane consists of electrospun nanofibers from the solutions based on expanded polystyrene with beta-cyclodextrin additive, having the BET surface area of 4...25 mp/g, a total pores volume of 1.5...6.5·10<sup>-2</sup> cmc/g, tensile strength of 1...7 MPa, modulus of elasticity of 0.01...0.15 GPa, a water contact angle of 117...128° and a diameter of electrospun fibers of 500...2500 nm. The process consists in the dissolving of 15...20% expanded polystyrene in dimethylformamide by magnetic stirring at 25°C and a speed of 420 rpm until dissolution, the addition of 1...5% beta-cyclodextrin and electrospinning at an applied voltage of 18 kV, a deposition time of the electrospun fibers of 120...240 minutes and drying of the electrospun membrane at 25°C, under ventilation, for 4...6 hours.</p> <p>Applications: The electrospun membrane based on expanded polystyrene with cyclodextrin additive could be used for water filtration processes.</p>
<b>Class</b>	1

**RO.180.**

<b>Title</b>	<b>Power generation system by photovoltaic conversion, with antireflective coating</b>
<b>Authors</b>	PÎSLARU-DĂNESCU Lucian, CHITANU Elena, EL-LEATHEY Lucia-Andreea, BĂBUTANU Corina-Alice, MARIN Marcel-Dorian, MOREGA Alexandru-Mihail, MOREGA Mihaela, POPA Nicolae-Călin
<b>Institution</b>	<b>National Institute for R&amp;D in Electrical Engineering ICPE-CA (INCDIE ICPE-CA)</b>
<b>Patnet</b>	Patent application No. A/00297/2017

<b>Description</b>	<p>According to the invention, the antireflective coating system consists of Si photocatalytic modules, for which antireflective coating is obtained by a process of depositing on the surface of the glass plate heated at 100 °C of the ZnO-seated layer by pyrolytic spraying and centrifugation, followed by heat treatment for 30 minutes and obtaining the nanostructured ZnO film by hydrothermal growth of nanostructures at 90 °C for 2 hours. By the structure and morphology of zinc oxide nanostructured film coatings (ZnO), improves the photovoltaic conversion to low solar radiation via multiple internal reflections due to the nanostructures grown on the surface of the cover glass of the photovoltaic modules.</p> <p>The efficiency of conversion of solar energy into electrical energy is of 8.06% for solar radiation of 100 W/m<sup>2</sup>, 8.44% for solar radiation of 200 W/m<sup>2</sup>, of 8.95% for solar radiation of 400 W/m<sup>2</sup>, of 9.2% for solar radiation of 700 W/m<sup>2</sup> and 9.26% for solar radiation of 1000 W/m<sup>2</sup>.</p> <p>The power generated by the photovoltaic system is of 0.109 W for solar radiation of 100 W/m<sup>2</sup>, 0.208 W for solar radiation of 200 W/m<sup>2</sup>, of 0.451 W for solar radiation of 400 W/m<sup>2</sup>, of 0.814 W for solar radiation of 700 W/m<sup>2</sup> and 1,139 W for solar radiation of 1000 W/m<sup>2</sup>.</p> <p>Applications:</p> <ul style="list-style-type: none"> <li>- An increase in the energy efficiency of photovoltaic panels is achieved through the widespread use of zinc oxide nanostructured film coatings (ZnO);</li> <li>- Power supply to devices energy consumers in isolated locations for civil/military applications;</li> <li>- Harvesting energy.</li> </ul>
<b>Class</b>	2

**RO.181.**

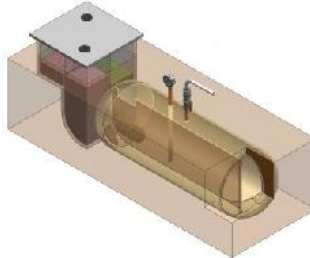
<b>Title</b>	<b>Tubular bioreactor with the liquid effluent partial recirculation</b>
<b>Authors</b>	Mateescu Carmen
<b>Institution</b>	<b>National Institute for R&amp;D in Electrical Engineering ICPE-CA (INC DIE ICPE-CA)</b>
<b>Patnet</b>	Patent application No. <b>A00324/2016</b>
<b>Description</b>	This invention relates to a bioreactor for treating organic waste, slurries and wastewaters by anaerobic digestion, generating biogas and ecological fertilizers. It is designed so

that allow partial recirculation of the liquid effluent between the two fermentation compartments, the recycled liquid being useful on the one hand for diluting the organic material fed into the bioreactor, and on the other hand to supplement the bacteria-rich inoculum needed to accelerate and intensify the fermentative processes. The bioreactor is of tubular construction, having a glass fiber fermenter placed underground, thermally insulated, divided by a longitudinal separating wall fitted with an overflow that allows partial recirculation of the liquid effluent. The fermenter is connected to an organic slurry tank through an inlet pipe, and to a digested sludge tank with expansion chamber through an outlet pipe, both tanks being made of concrete and covered with a lid provided with two openings with flexible valves for supplying the organic slurry, respectively discharging the digested sludge. The bioreactor is equipped with a gas pipe for evacuating biogas and with an appropriate device for measuring the liquid level in the fermenter. It is completely autonomous energetically, requiring no energy-consuming operations such as homogenization or heating the organic mass.

Application: The bioreactor is intended for the energy recovery of organic fraction from waste and wastewaters released by agro-food industry (including crop residues, animal manure, catering waste) with producing biomethane which may be used as fuel gas but also to make heat and electricity.

**Class**

1. Environment – Pollution Control



**RO.182.**

**Title** Microsensor gloves

**Authors** Ignat Mircea, Hristea Gabriela, Ojoga Miruna  
Alexandra, Tudorache Ana Maria

**Institution** National Institute for R&D in Electrical Engineering  
ICPE-CA (INCDIE ICPE-CA)

**Patnet** Patent application No.: a 2017 00141 /08.03.2017

**Description** The invention relates to a microsensor gauze used in patient evaluations following specific medical recovery procedures for the upper limb whose operation is based on piezoelectric microsensors fixed to the fingers of the glove. According to the invention, the glove according to the invention is composed of a piezoelectric microsensor, each microsensor being protected from the destructive effects of accidental mechanical stresses, made of silicone rubber covering the microsensors, the microsensors being fixed by means of adhesives on the toes of the fingers a medical gauntlet and each of the two sensors.

**Class** Applications : Medical Recovery  
4

**RO.183.**

**Title** Method for Obtaining Self-Assembled Membranes

**Authors** Gabriela Hristea, Mihai Nicolaie Iordoc, Paula Prioteasa

**Institution** National Institute for R&D in Electrical Engineering  
ICPE-CA

**Patnet** RO 131108

**Description** The method according to the invention, consists in the fact that a graphite substrate is subjected to oxidation with a mixture of powerful acids along with an oxidation accelerator, resulting in a graphite oxide which is further subjected to sonication in dipolar aprotic solvents for 30 min and up to 5 hours, which results in a graphene oxide material, subsequently reduced with sodium borohydride. The resulting graphene oxide is heated to 50°C for 1-3 hours forming self-assembled films with controlled thickness between 0.1 and 2 microns.

**Application:**  
Electronic industry: nanoelectronics, sensors/biosensors, nanotransistors, passivation of surfaces, etc.  
Medicine: biomolecule grafting on self-assembled films:



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protein coupling, DNA assemblage, cellular interactions, biosensors, etc;

Environment: Filters for water purification, heavy metals separation membranes

Energy: Supercapacitors

**Class** 1

### RO.184.

**Title** 1.5kW redox-flow stack with continuous recirculation  
**Authors** Iordoc Mihai Nicolae, Teisanu Aristofan Alexandru, Barbu Ionela Paula

**Institution** National Institute for R&D in Electrical Engineering ICPE-CA (INCDIE ICPE-CA)

**Patnet** Patent application No. A/00956/2016

**Description** The 1.5KW rectangular stack based on redox recirculation cells is made up of four sub-sites each containing 18 redox elements, which are provided with, electrolyte-fed in parallel, and electrically connected in series, each element having an independent electrolyte supply system, ensuring simple and fast servicing and maintenance. Novelty consists in the way the electrolyte circulates through an element that runs through 41 parallel channels, which ensures the uniform irrigation of the graphite pitch electrode and thus determines the optimal functioning of the element. Also, unlike the current similar systems, which fluid circulation is made in a "serial" configuration, each subsite is fed in parallel, so that the variation in the concentration of the species that oxidizes or reduces in the electrochemical process varies in the same way in all the elements. This allows the operation of all elements in an identical mode and does not allow the differences between the internal resistance of the different elements to occur. This avoids premature wear and damage and damage reduction.

**Class** 2

### RO.185.

**Title** Cryogenic cooling system for the cylindrical superconducting coils

**Authors** Dobrin Ion, Popovici Iuliu Romeo, Dobrin Andrei, Enache Dan

**Institution** National Institute for Research and Development in Electrical Engineering ICPE-CA (INCDIE ICPE-CA,

**Bucharest)**

**Patnet**

Patent application No. a 2017 00279/10.05.2017

**Description**

The invention relates to a cryogenic cooling system for superconducting coils used in the field of particle accelerators. According to the invention, the system consists of a cryocooler having a first cooling end functioning at a working temperature of 50 K with the purpose of cooling a thermal screen in order to reduce the thermal radiation of a cryostat and a second end cooling at a working temperature of 4 K to cool a condensation chamber and some condensing elements, used to condense the helium gas, from the superconducting coils cooling, in liquid helium by passing through a cooling coil and some gaseous helium access pipes, respectively liquid helium drainage and a central channel, the latter having the role of allowing accelerated particle access to the magnetic field produced to correct the size and shape of the particle stream through the action of the magnetic field produced by the superconducting coils.

Applications:

**Class**

Particles accelerators, applied nuclear physics

2. Energy and sustainable development



**RO.186.**

**Title** **Method of obtaining fluorescent magnetic nanocomposite**  
**Authors** Georgescu Gabriela, Malaeru Teodora, Morari Cristian  
**Institution** **National Institute for R&D in Electrical Engineering ICPE-CA (INCIE ICPE-CA)**  
**Patnet** Patent No. 131726 / 2018

**Description**

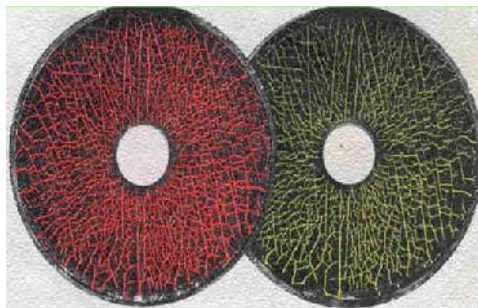
The process consists in the dispersion of  $\gamma\text{-Fe}_2\text{O}_3$  in an aqueous solutions of iron (II) oxalate and polyvinylpyrrolidone in deionized water, refluxing at  $55^0 \dots 58^0$  C with stirring at a rate of 1000...1200 RPM for 1...2 hours, the dropwise addition of oxalic acid solution to change the pH to 2...3. The solution was boiled under reflux at  $100^0\text{C}$  for 3...6 hours under argon, resulting in a aqueous suspension of magnetite nanoparticles, in which an aqueous solution of nickel acetate and an oxine alcoholic solution are added; the suspension is refluxed for 2...6 hours with stirring at a speed of 1000...1200 RPM, from which fluorescent nanocomposite type  $\text{Fe}_3\text{O}_4$  - fluorescent dye is obtained.

Applications: In defectoscopy for the nondestructive detection of very fine discontinuities from the surface or near the surface of the ferromagnetic parts in:

- metallurgical industry;
- machine building industry;
- repairs of industrial constructions;
- transports.

**Class**

Invention Classification: 5



**National Institute for Research and Development in  
Environmental Protection - INCDPM**

**RO.187.**

**Title**                    **METHOD OF OBTAINING THE CALCIUM HYDROXIDE NANOPOWDER BY RECYCLING THE EGGSHELLS WASTES DERIVED FROM AGROINDUSTRIAL ACTIVITIES - PROVCO-NaP**

**Authors**                PANAIT Ana-Maria, MONCEA Mihaela-Andreea, DUMITRU Florina-Diana, DEÁK György

**Institution**            **NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN ENVIRONMENTAL PROTECTION**

**Patent no.**              A/00226/2019

**Description**            The invention reefers to a method for obtaining calcium hydroxide nanopowder (nano-Ca(OH)<sub>2</sub>), by recycling the eggshells derived from agroindustrial activities (e.g. from aviary farms after the eggs hatching, eggs packing process, food industry etc.). Due to the high calcium content of eggshell (over 95% CaCO<sub>3</sub>), this type of waste has a great potential to be used as precursor for synthesis of nano-Ca(OH)<sub>2</sub>.

In order to remove the organics traces (the egg white and yolks), the eggshells are first washed with water in abundance until the white foam that forms is gone. The clean eggshells are forward solubilized in a strongly acidic medium (pH = 1 - 3) by using a solution of HCl 8 - 15%. The resulted solution is filtered to remove the inner membrane of the eggshells. From the filtered solution the Ca(OH)<sub>2</sub> is precipitated by using sodium hydroxide (NaOH 10 - 15M) and the white precipitate is filtered, washed with distilled water and dried at 100 -150 °C, for 1 - 4 hours.

The obtained nano-Ca(OH)<sub>2</sub> was characterized from physical-chemical point of view, by using different techniques (X-ray fluorescence and diffraction, particle size distribution and scanning electron microscopy). The results showed that the nano-Ca(OH)<sub>2</sub> has a CaO content of 96 -99% and the particles dimensions ranging between 0.01 - 0.1 µm.

The nano-Ca(OH)<sub>2</sub> can be used as admixture in inorganic binders with pozzolanic properties (e.g. slugs, clays) in order to improve their reactivity or to increas the mecanical performances.

**Class**

1, 7

**RO.188.****Title****Prefabricated parapets for roads, bridges and highways that incorporate photovoltaic cells****Authors**

George Poteraş, György Deák, Alina-Florina Nicolae, Andreea-Georgiana Baraitaru, Marius Viorel Olteanu

**Institution****National Institute for Research and Development in Environmental Protection Bucharest****Patent no.**

Patent application No. A/00577/2018

**Description**

The invention relates to the development of prefabricated elements for traffic safety parapets on roads, bridges and highways, which include photovoltaic cells. Secondary raw materials from waste recycling are incorporated into cells composition, and also, the material used for parapets fabrication can include recycled aggregates from decommissioned concrete. By integrating cells into the parapets bodies, the systems acquire the function to ensure traffic safeness and to obtain electricity from renewable sources. The produced electricity can be used to illuminate the road infrastructure and/or can be stored and delivered to the charging stations for powering electric or hybrid vehicles. Moreover, as it is used on significant lengths of roads, bridges and highways, where usually is the maximum insolation value and where are no obstacles to shade the prefabricates that incorporate photovoltaic cells, important renewable energy resources can be generated by applying this solution.

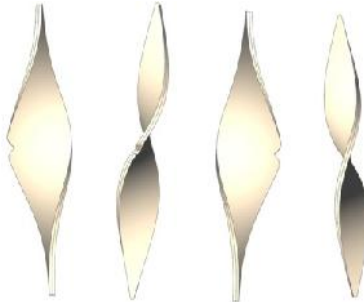
**Class**

1, 2, 7, 8, 12



**RO.189.**

<b>Title</b>	<b>Blades with geometries inspired by a bioengineering model, adapted to vertical axis wind turbines and horizontal axis water turbines</b>
<b>Authors</b>	George POTERAȘ, György DEÁK, Alina-Florina NICOLAE, Andreea Ioana DĂESCU, Iasmina Florina BURLACU, Ionel NEACȘU
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection Bucharest</b>
<b>Patent no.</b>	Patent application No. A/00903/2018
<b>Description</b>	<p>The invention consists in the development of blades with shapes inspired by nature, which are adapted to vertical axes wind turbines and to horizontal axis hydraulic turbines.</p> <p>Following laboratory research, in which several configurations inspired by nature were analyzed and tested under similar conditions to those in situ, the blades geometry was determined. Thus, the development of blades which generate to the rotor a higher number of rotations per minute, compared to classical solutions, at the same intensity of air/water flow, can be inspired by the torsional shape of the heaven tree (<i>Ailanthus altissima</i>) seed. The turbines provided with these types of blades have a superior efficiency in converting wind/hydraulic energy into electricity, with minimal impact on the environment.</p>
<b>Class</b>	1,2

**RO.190.**

<b>Title</b>	<b>Ceramic filters impregnated with mesoporous silica for heavy metals removal from water and impregnation process (CERASIM)</b>
<b>Authors</b>	György DEÁK, Marius Viorel OLTEANU, Andreea

<b>Institution</b>	Georgiana BARAITARU, Florina Diana DUMITRU, Andreea Mihaela MONCEA, Gabriel CORNĂȚEANU, Mădălina Georgiana BOBOC, Adrian Ștefan ZAMFIR <b>National Institute for Research and Development in Environmental Protection Bucharest</b>
<b>Patent no.</b>	Patent application No. A/00883/2018
<b>Description</b>	The invention relates to the development of ceramic filters which incorporate mesoporous silica particles in their pores, having the property of retaining the heavy metals from wastewater. The inclusion of mesoporous silica particles in the pores of the ceramic filters takes place during the mesoporous silica synthesis process as well as after its complete synthesis. Ceramic filters impregnated with mesoporous silica contribute to the reduction of industrial pollution and are suitable for the financial social needs, having a depreciable production price with their regenerative capacity, and also high efficiency in removing heavy metals from water. Following the efficiency tests performed on the ceramic filter impregnated with mesoporous silica, it was established that the filter has a high heavy metal retention efficiency in the pH range of 5,5-10 (below the detection limit for certain heavy metals).
<b>Class</b>	1, 7

**RO.191.**

<b>Title</b>	<b>WIN-WIN SOLUTION FOR THE PROTECTION OF STURGEON SPECIES AND FOR ENSURING NAVIGATION CONDITIONS ON BALA BRANCH VS. OLD DANUBE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT IN ROMANIA</b>
<b>Authors</b>	DEÁK György, Georgescu Puiu-Lucian, Poteraș George, Raischi Constantin Marius, Olteanu Marius Viorel, Badea Gabriel, Cornățeanu Gabriel, Cristea Alexandru, Zaharia Felix
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN ENVIRONMENTAL PROTECTION</b>
<b>Description</b>	A/00186/2018
<b>Class</b>	In 9 years of monitoring, INCDPM experts have developed techniques, procedures for ultrasonically tagging and monitoring of sturgeon species by the help of floating and fixed

## EUROINVENT 2019

stations, and also methods for reducing the risk of poaching. Until now, INCDPM is the only institution who scientifically demonstrated that the bottom sill constructed at 0 BSC elevation level on the Bala Branch, has no risk of interrupting the migration routes of the ultrasonically tagged sturgeons. This scientific argumentation corroborated with the results obtained regarding the sturgeons behaviour have led to the identification of a win-win solution that ensures both the navigational conditions and the sturgeon migration routes.

In order to demonstrate the applicability of the hydrotechnical solution, the INCDPM experts have developed a physical model of the Old Danube – Bala Branch bifurcation area based on the interpretation of the measurements performed in numerous field campaigns, collected in a detailed database. The physical model has been designed at 1:750 (XY) scale and vertically at the 1:100 (Z) scale. To facilitate the auto-dredging phenomenon and implicitly to accelerate the erosion phenomena on the Old Danube, there have been constructed structures having openings ranging from 50 to 140 m (three versions have been experimented: 50m/70m/140m).

The physical model demonstrates the applicability of this patent by emphasizing the auto-dredging phenomenon, in case of a level difference between the main riverbed and its branch. The outputs resulted after the tests performed for the three versions (50/70/140m) were of approximately 40%, these being able to evolve in time through the increase of auto-dredging phenomena.

The win-win hydrotechnical solution that solves the Bala Branch issue, is the result of a multi-annual research that sustains the sustainable development of the Romanian Danube sector.

1, 2



NATIONAL



RO.192.

<b>Title</b>	<b>Water quality parameters assessment by using numerical models for pollutant dispersion simulation on the Danube River</b>
<b>Authors</b>	Georgeta TUDOR, DEÁK György, Bogdan URÎTESCU, Constantin CÎRSTINOIU, Marius RAISCHI, Ștefan - Adrian ZAMFIR, Gabriel BADEA, Tiberius-Marcel DĂNĂLACHE, Elena HOLBAN, Bianca PETCULESCU, Theodor LUPEI
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection</b> The issue of pollutants transport and dispersion in the aquatic environment is difficult to analyze due to in situ data scarcity and technical limitations of the dedicated modelling software. Generally, the input data used in such programs are punctual and the results provided cannot characterize the investigated watercourse at full extent. In order to develop the necessary water quality parameters database, field campaigns have been carried out: single-beam and multibeam bathymetry measurements and water current velocity vectors and discharge values determining using the Acoustic Doppler Current Profiler technique. The riverbed relief data has been used for the geometric model by integrating the resulted elevation values into the numerical model computing network. In order to obtain highly reliable results, for the model calibration and validation processes, have been used pairs of discharge and water level values resulted from field campaigns performed in different Danube river flow conditions. The hydrodynamic model for the Epurașu Danube Branch has been applied for the simulation of an accidental pollution event and the analysis of pollutant transport and dispersion in the watercourse. The in situ measurements and numerical modeling techniques and the process flow used for this research can be adapted to similar river sectors and can be used as a starting point for a multitude of applications, such as water quality assessment, sediment transport studies, ichthyofauna habitats assessment etc.
<b>Description</b>	

**RO.193.**

<b>Title</b>	<b>Road traffic PM 10 pollution monitoring in Bucharest</b>
<b>Authors</b>	Simona Natalia Raischi, Eduard Pană, Lucian Lumînăroiu, Cătălin Voiculeț, Andreea Dăescu, Ștefan Zamfir, Cristina Sîrbu, Marius Raischi, Mădălin Silion, Gabriel Cornățeanu, Gabriel Badea
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection</b>
<b>Description</b>	According to the World Health Organization, air pollution caused by road traffic is one of the most environmentally important issues that could cause problems regarding health and well-being of the urban population. The aim of this paper is to examine if the traffic level has a major impact on particulate matter concentration levels. In this regard, the INCDPM experts conducted an <i>in-situ</i> monitoring campaign using PM 10 mobile dust particle monitors (Kanomax 3443) which use the light scattering method. The mobile weather station was used to measure meteorological parameters. The studied area is near Miguel de Cervantes High School, an area of high population density and intense traffic in Bucharest. Three mobile dust particle were used to monitor the evolution of concentration levels, in five points, along the length of the main boulevards. The results show an increase of PM10 values during traffic peak periods and high humidity levels.

**RO.194.**

<b>Title</b>	<b>Research on the use of advanced materials in water treatment and their durability as barriers / filters</b>
<b>Authors</b>	Olteanu Marius, Dumitru Diana, Moncea Andreea, Baraitaru Andreea, Panait Ana-Maria, Deák György, Poteraș George
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection Bucharest</b>
<b>Description</b>	In order to develop advanced materials, modern synthesis techniques have been used, aimed to remove heavy metals and organic pollutants from wastewater. The synthesis of mesoporous silica powders was performed through the hydrothermal method, in order to obtain a nanoparticle structure with high crystallinity for various environmental

applications. The obtained materials (R2 and R4) were doped with CeO<sub>2</sub> and TiO<sub>2</sub> to improve the retention properties of heavy metals, as well as with three types of calixarene (C<sub>44</sub>H<sub>56</sub>O<sub>4</sub>, C<sub>28</sub>H<sub>24</sub>O<sub>4</sub>, C<sub>32</sub>H<sub>32</sub>O<sub>4</sub>), to enhance the phenols retention properties. Additionally, for the characterization of the developed advanced materials, techniques and methods specific to these types of materials have been used (X Ray diffraction analysis -XRD, scanning electron microscopy - SEM, X Ray fluorescence analysis – XRF, specific surface area analysis – BET, differential scanning calorimetry analysis – DSC, etc.). As a result of the filtration tests, due to the aromatic nucleus of the phenols causing an increase in acidity, a modest retention rate was observed only for uncalcinated control samples, while for heavy metals tests, good retention efficiency was highlighted both for control samples and for CeO<sub>2</sub> and TiO<sub>2</sub> functionalized materials.

## Class

### RO.195.

#### Title

**Development of recycling techniques for CRT glass into ecological construction materials**

#### Authors

Marcus Maria-Iuliana, Deák György, Dumitru Diana, Moncea Mihaela-Andreea, Panait Ana-Maria, Maria Cristina National Institute for Research and Development in Environmental Protection – INCDPM

#### Institution

The research has been focused on a recycling technique for CRT glass into cementitious materials. For this purpose, the chemical stability in aqueous media of the CRT glass was assessed prior to its use in plastering mortars to investigate its pollution potential. To analyze the mortars capacity to encapsulate CRT waste, leaching tests was performed. The plastering mortars were prepared using ordinary Portland cement (CEM I 52,5R) and sand aggregate (mixed with CRT glass - funnel glass and panel glass in ratio 1:1). The oxide composition of the CRT glass used in the experiments mixture was determined by X-ray fluorescence spectrometry. The results showed a content of over 7% PbO. The leaching behavior of the mortar specimens after 7 days of hydration revealed that the analyzed samples do not present pollution potential. The heavy metals (Pb, Zn, Ni) concentrations were under the limit allowed by the current legislation, namely for acceptance of waste on inert waste landfills. The use of CRT

#### Description

glass waste as a partial replacement of sand represents an important step towards sustainable, ecological, energy efficient and technical-economic development of the construction materials industry. The use of alternative sources to obtain inorganic binding materials will reduce the consumption of natural resources and improve the sustainability of the developed materials. Also, the need to landfill certain waste, such as CRT glass, will be eliminated, reducing the long-term impact to the environment and human health.

**RO.196.**

**Title** **Detection and quantification of pharmaceutical micropollutants in aquatic environment using high performance techniques UHPLC and ICPMS**

**Authors** Mihaela Ilie, Florica Marinescu, Alexandru Ivanov, Irina Ciobotaru, Deák György, Gina Ghita, Savin Ioana, Ana-Maria Anghel, Bianca Petculescu

**Institution** **National Institute for Research and Development in Environmental Protection (INCDPM)**

**Description**

Water pollution with emerging pollutants like estrogen, antibiotics and other pharmaceuticals is a new environmental concern due to their continuous input and persistence in the aquatic ecosystem. Although recent studies have indicated the presence of emerging pollutants in low concentrations in aquatic environments, there is few data on the nature and magnitude of impact, their distribution, mobility and persistence in wastewater and natural aquatic ecosystems. The presence of these micropollutants in surface waters, even at low concentrations, endangers the life cycle of aquatic organisms and disturbs the ecological balance, so that the identification and evaluation of these substances in the environment have become a necessity.

**Class**

In this context, the aim of the study was to develop and optimise a sensitive, selective and accurate UHPLC-MS/MS (ultra-high performance liquid chromatography) methods able to determine pharmaceuticals from different aqueous matrices at trace level concentration (ng/L). The methods were optimized to detect the following categories of micropollutants: i) antibiotics: doxycillin, erythromycin, ampicillin, chloramphenicol, trimethoprim; ii) estrogenic

hormones: 17- $\alpha$ -ethinylestradiol, 17- $\beta$ -estradiol; iii) anti-inflammatory and analgesic agents: diclofenac, ibuprofen, caffeine. Also analytical methods using the ICP-MS have been developed and tested for the detection of elemental inorganic pollutants from aquatic environments, usually found in pharmaceutical products composition. Experiments were performed using UHPLC Thermo Scientific Equan Max Plus TSQ Quantiva and Perkin Elmer ICPMS Nexlon 350X equipment.

The main results of the study contribute to the development of advanced analytical methods for the detection and quantification of pharmaceuticals as micropollutants in different aqueous matrices and represent useful tools for more detailed environmental risk assessments in line with the European Union environmental objectives.

**RO.197.**

<b>Title</b>	<b>Multiannual characterization of the migrating population of Pontic shad (<i>Alosa immaculata</i> Bennet, 1835) at the Romanian side of the Danube River, downstream to the city of Calarasi</b>
<b>Authors</b>	Danalache Tiberius-Marcel, Deak Gyorgy, Raischi Marius Constantin, Holban Elena, Matei Monica, Boboc Madalina, Parlog Cosmin, Cristea Alexandru, Gheorghe Ionut, Fronescu Diana
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection - Bucharest</b>
<b>Description</b>	Traditionally, the Pontic shad ( <i>Alosa immaculata</i> Bennet, 1835) has played an important economic and cultural role for the inhabitants of the Lower Danube River area. As a consequence of overfishing and dam construction, the population size has diminished and large areas of spawning grounds have been lost. At present, the species is listed as Vulnerable by the IUCN, is protected by the Bern Convention and included in the Annexes II and IV of the Habitats Directive. Knowledge on the biology of the Pontic shad is essential for the species' conservation and the management of its stocks. Consequently, between 2011 and 2018, the National Institute for Research and Development in Environmental Protection-Bucharest (INCDPM) has carried out eight monitoring campaigns in order to

characterize the spring spawning population. Scientific fishing was done downstream to the city of Calarasi, between 348 and 340 river Km using floating drift nets. Biometric data was collected from 286 individuals having the average total length of  $28.8 \pm 3.74$  cm and average total weight of  $258 \pm 94$  g. The majority of the migrating individuals (78.32%) were part of the age class III (44.41%) and IV (33.92%) years. Overall F/M ratio was 1.08, close to the expected value of 1. Analysis of the full data set found a strong relationship ( $R^2 = 0.986$ ) between total length and total weight, showing negative allometric growth ( $W = 0.0149 \times TL^{2.8926}$ ). Fulton's condition factor values ranged between 1.39 and 1.41 with the average value of 1.40, indicating good body condition.

**RO.198.**

<b>Title</b>	<b>Research on the impact of heavy metal bioaccumulation in different freshwater fish species on human health</b>
<b>Authors</b>	Petra Ionescu, György Deák, Monica-Violeta Radu, Ecaterina Marcu, Irina-Elena Ciobotaru, Alexandru Anton Ivanov, Ana-Maria Anghel, Bogdan Urişescu, Cristina Cimpoeru
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection</b>
<b>Description</b>	<p>Aquatic ecosystems pollution is one of the main concerns globally and specifically heavy metals contamination is of interest due to their persistence in the environment, tendency to bioaccumulate and potential effects on living organisms at low levels.</p> <p>Insufficient information is available at national level regarding heavy metals concentrations in aquatic ecosystems and particularly in freshwater fish species. This project addresses this issue by creating/updating a national database on the levels of heavy metals in different freshwater fish species and evaluating their potential risks on human health caused by ingestion.</p> <p>In this purpose, the abiotic (water, sediments) and biotic (<i>Alburnus alburnus</i>, <i>Perca fluviatilis</i> and <i>Carassius gibelio</i>) compartments were investigated in two aquatic ecosystems of high environmental importance, the Dâmboviţa and Argeş Rivers.</p> <p>The values of the physicochemical quality indicators were</p>

compared to the legislation in force. Based on the results obtained within INCDPM researches and literature data, a national database on the concentrations of heavy metals in different fish species was created. Bioaccumulation of heavy metals in biota was evaluated by means of bioaccumulation factors and several indices for the estimation of potential risks on human health were presented, namely: estimated daily intake (EDI), target hazard quotient (THQ), hazard index (HI) and teratogenic risk (TR).

The results highlighted the necessity to monitor regularly the heavy metals content in fish species intended for human consumption for raising awareness and preventing their excessive accumulation in the food chain. Further research on other aquatic ecosystems for updating the INCDPM Bucharest database is recommended.

**RO.199.**

<b>Title</b>	<b>Contributions to the improvement of wastewater quality using modern technologies with the purpose to eliminate hazardous organic compounds</b>
<b>Authors</b>	Eng. BURLACU Iasmina- Florina- CS, Bio. CIMPOERU Cristina – CS, Eng. DĂESCU Andreea Ioana – CS, Eng. VOICULEȚ Cătălin – ACS
<b>Institution</b>	<b>National Institute for Research and Development in Environmental Protection</b>
<b>Description</b>	In this paper are presented laboratory and pilot researches achieved during the project implementation, which develop advanced techniques for reducing small concentrations of hazardous pollutants from wastewater (resulted from different sectors of activities: petroleum industry, agriculture, pharmaceutical industry etc.). Researches were focused on the application of modern and advanced materials during the experimental treatment of wastewaters using the next procedures: oxidation, adsorption, UV rays, decantation, flocculation, coagulation, etc. The main project objectives are: - usage of advanced technology for reduction of organic compounds existing in wastewater;



- combination of coagulation, flocculation and decantation processes for removal of petroleum products from aqueous media;



- obtaining a functional support material to be used in the treatment of waters contaminated with organic substances.



**RO.200.**

**Title**

**Geomorphological researches regarding the Bala Branch - Danube evolution in the context of hydrotechnical works - a DKLB-C type win-win solution**

**Authors**

DEÁK György, Badea Gabriel, Lupei Theodor, Urişescu Bogdan

**Institution**

**The National Institute for Research and Development in Environmental Protection, Bucharest**

**Description**

This paper is based on a study that consists in determining key aspects regarding the Bala Branch – Old Danube hydrotechnical and hydromorphological situation. Hydrotechnical works carried out so far have not solved the issues regarding flow efficiency required for shipping in safe condition. It was estimated that in case of low water, up to 80% of the Old Danube flow is redirected on Bala Branch.

In the current situation there is a need to find a hydrotechnical solution that can be applied with concrete



results. The National Institute for Research and Development in Environmental Protection experts develop a technical solution elaboration regarding the water flow redistribution on Old Danube based on the experience gained in numerous in-situ measurements campaigns.

The method developed by the INCDPM experts is destined for redistributing water discharge in the situation of flow level difference between the main river bed and its branch, so as to obtain a flow equalization or even an increase in river discharge during the drought period. This method is a win-win solution due to the fact that provides safe navigation and ensuring the sturgeon migration routes on the Danube River Bala Branch sector.

Based on the patented hydrotechnical solution, a physical model was build, on which were conducted several test in laboratory condition, and also a demonstration using numerical modeling.

**National Institute For Research&Development  
in Mine Safety and Protection to Explosion  
INSEMEX Petroșani**

**RO.201.**

<b>Title</b>	<b>Apriori solving method for a ventilation network affected by an explosion phenomenon</b>
<b>Authors</b>	<b>Doru Cioclea, Artur George Găman</b>
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN MINE SAFETY AND PROTECTION TO EXPLOSION -INSEMEX PETROȘANI</b>
<b>Patent no.</b>	<b>C.B.I. A 2016 00788</b>
<b>Description</b>	The invention relates to a method for the apriori solution of an ventilation network affected by an explosion phenomenon. For this purpose, the ventilation system is solved under normal operating conditions. It is determined the affected area of the ventilation network. The total resistance of the ventilation network is recalculated. It is determined the functional parameters, the depression developed and the flow rate at the main ventilation station after an explosion. Introducing the functional parameters of the post-event active fan and by solving the ventilation network under the new conditions, the air flow distribution at the branch level is obtained.
<b>Class</b>	Application to INCD INSEMEX Petroșani 12

**RO.202.**

<b>Title</b>	<b>Stand for gas explosion imaging research.</b>
<b>Authors</b>	<b>Nicolae-Ioan Vlasin - PhD.Eng., George Artur Găman - PhD.Eng.</b>
<b>Institution</b>	<b>National Institute For Research And Development In Mine Safety And Protection To Explosion -Insemex Petroșani</b>
<b>Patent no.</b>	<b>C.B.I. A 2016 00788</b>
<b>Description</b>	The invention relates to a stand for explosion imaging research of air-flammable gases mixtures, which allows the recording of the ignition and evolution of combustion (development of the flame front) by means of a high-speed

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camera (more than 30,000 frames per second), by using Schlieren techniques..

Application to INCD INSEMEX Petroșani

**Class** 5

### RO.203.

**Title** **Universal system for the determination of the minimum ignition energy of air-flammable substances explosive mixtures**

**Authors** **Maria Prodan, Emilian Ghicioi**

**Institution** **National Institute For Research And Development In Mine Safety And Protection To Explosion - Insemex Petroșani**

**Patent no.** **C.B.I. A 2017 00457**

**Description** The invention relates to a universal system for determining the minimum ignition energy of explosive mixtures of air-flammable substances, which is applicable to flammable air-gas mixtures, air-combustible dust and air-flammable liquid vapors, generating continuously adjustable energies between 5  $\mu$ J and 20 J..

Application to INCD INSEMEX Petroșani

**Class** 5

### RO.204.

**Title** **Explosion protected warning device for proximity detection of mobile terminals being in broadcast**

**Authors** **Darie Marius - PhD.Eng., Găman George Artur - PhD.Eng.**

**Institution** **National Institute For Research And Development In Mine Safety And Protection To Explosion -Insemex Petroșani**

**Patent no.** **C.B.I. A 2017 00612**

**Description** The invention refers to an explosion-protected proximity detector for mobile terminals being in broadcast. The operation is based on the detection of atypical values in the intensity of the electromagnetic field

Application to INCD INSEMEX Petroșani

**Class** 12

**RO.205.**

**Title** Stand for determining reaction products generated by solid combustible materials

**Authors** Ghicioi Emilian - PhD.Eng., Găman George Artur - PhD.Eng.

**Institution** NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN MINE SAFETY AND PROTECTION TO EXPLOSION -INSEMEX PETROȘANI

**Patent no.** C.B.I. A 2017 00929

**Description** The invention relates to a stand for determining reaction products generated by combustible solid materials subject to a controlled combustion/thermal decomposition process (pyrogenic process), providing the possibility for setting up the temperature, the air flow for combustion, the air flow for diluting effluents, the speed of inputting the sample into the furnace, in order to study the behaviour to exposure to the thermal radiation, the loss of mass, the clouding degree, of solid sample deposition and of the fuel-oxidant ratio.

**Class** Application to INCD INSEMEX Petroșani  
12

**National Institute for Research-Development  
for Non-ferrous and Rare Metals – IMNR**

**RO.206.**

<b>Title</b>	<b>PROCESS FOR OBTAINING ALUMINIUM ALLOYS WITH IMPROVED MECHANICAL PROPERTIES BY MICROALLOYING WITH NANOSTRUCTURED MASTER ALLOYS</b>
<b>Authors</b>	Vasile SOARE, Dumitru MITRICA, Ionut CONSTANTIN
<b>Institution</b>	<b>National R&amp;D Institute for Non-ferrous and Rare Metals – IMNR</b>
<b>Patent no.</b>	<i>RO 128755 A2 / 30.01.2018</i>
<b>Description</b>	The invention relates to a process for the production of cast and deformable aluminium alloy, with improved mechanical characteristics, by treating the metal bath with nanostructured master alloys of the AlSr10 and AlTiB1 type. The process according to the invention, consists in treating the metal bath with products in the form of pressed briquettes of nanostructured strips, obtained by a light rate solidification process. Through the present patent, master alloys of AlSr10 and AlTiB1 are obtained in the nanostructured form, by-melt spinning technique. The - melt spinning solidification method applied in the present invention, consists in ejecting a molten alloy onto a spinning copper disc.
<b>Class</b>	6. Mechanical Engineering-Metallurgy

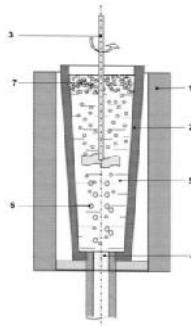
**RO.207.**

<b>Title</b>	<b>PROCESS OF OBTAINING A POROUS ALUMINIUM ALLOY</b>
<b>Authors</b>	Dumitru MITRICA, Vasile SOARE, Ionut CONSTANTIN, Marian BURADA, Mihai GHITA
<b>Institution</b>	<b>National R&amp;D Institute for Non-ferrous and Rare Metals – IMNR</b>
<b>Patent no.</b>	<i>RO 129439 B1 / 30.08.2018</i>
<b>Description</b>	Invention relates to a process for the preparation of an Al-Si-Ca-Mg type porous aluminium alloy having a specific gravity, by treating with stabilizing elements and insufflation of gas in the melt. The proposed process for obtaining metallic porous materials based on an aluminium alloy by bubbling gas into the melt involves the

creation in the melt of intermetallic compounds and thermodynamically stable oxides, which contribute to the formation of the porous structure of the alloy. The process results in the production of an Al-Si-Ca-Mg type porous aluminium alloy through the steps of producing an Al-Si-Mg intermediate alloy, maintaining the melt for homogenization, adding calcium as a modifier, argon bubbling in the melt metallic and then collecting metallic foam on the surface of the bath and cooling it.

**Class**

6. Mechanical Engineering-Metallurgy

**RO.208.**

**Title** **INORGANIC PHASE CHANGE MATERIALS BASED ON POTASSIUM NITRATE MICRO ENCAPSULATION PROCESS IN A NANOSTRUCTURED INORGANIC ZINC OXIDE SHELL WITH APPLICATION IN THERMAL ENERGY STORAGE**

**Authors** Radu-Robert PITICESCU, Maria Dolores ROMERO-SANCHEZ, Adrian Mihail MOTOC

**Institution** **National R&D Institute for Non-ferrous and Rare Metals – IMNR**

**Patent no.** *EP 3450010 A1 / 06.03.2019*

**Description** The patent refers to an inorganic phase change materials based on potassium nitrate micro encapsulation process in a nanostructured inorganic zinc oxide shell with application in thermal energy storage in the temperature range 300-500°C. Microencapsulation process is characterized by the fact that the nanostructured zinc oxide shell is precipitated with potassium hydroxide on the potassium nitrate particles which are dispersed in the alcohol solution of zinc nitrate at 9.0 pH,

followed by solvo-thermal treatment in an autoclave for 2 hours at 200°C and 40 atm. argon pressure, followed by spray-drying process of the suspensions at an air temperature of about 200°C inside the spraying equipment and grain sizing in the range of 20-50 µm.

**Class**

2. Energy and sustainable development

**RO.209.**

**Title** **NEW CONCEPTS FOR EFFICIENT EXTRACTION OF MIXED RARE EARTHS OXIDES FROM MONAZITE CONCENTRATES AND THEIR POTENTIAL USE AS DOPANT IN HIGH TEMPERATURE COATINGS AND SINTERED MATERIALS – MONAMIX**

**Authors**

Radu-Robert PITICESCU, Mythili PRAKASAM, Maria Luisa GRILLI

**Institution**

**National R&D Institute for Non-ferrous and Rare Metals – IMNR, Pantelimon, Romania**  
**ENEA – Cassacia Research Centre, Rome, Italy**  
**CNRS – Institute Solid State Chemistry of Bordeaux, France**

**Description**

The objective of MONAMIX project is to demonstrate the potential use of mixed REOs obtained directly from monazite concentrates, with naturally occurring composition, as dopant in the design of high temperature oxide coatings and sintered zirconia-based oxide materials. This results in a high impact in reducing the actually reagents consumption and costs by eliminating the individual REO sequential extraction and separation. Applications foreseen are thermal barrier coatings working at temperatures up to 1400–1500<sup>0</sup>C, fulfilling the industry demand to increase the lifetime of Ni/Cr alloys and reduce the critical raw materials (CRMs) content in substrate alloys and SOFCs materials with controlled ionic conductivity at temperatures close to 400<sup>0</sup>C with low REO catalysts content.

*Acknowledgement: Research financed in the frame of ERAMIN II-COFUND programme, grant ID 87, contract UEFISCDI 50/01.04.2018*

**RO.210.**

**Title**                    **ADVANCED CERAMIC THERMAL PROTECTIVE SYSTEMS DEVELOPED THROUGH COMBINATORIAL EB-PVD DEPOSITION TECHNOLOGY – ANDROTECH**

**Authors**                Radu-Robert PITICESCU, Mircea CORBAN, Mihai BOTAN, Victor MANOLIU, Bogdan VASILE

**Institution**            **National R&D Institute for Non-ferrous and Rare Metals – IMNR, Pantelimon, Romania**  
**National Institute for Aeronautics – INCAS, Bucharest, Romania**  
**University Politehnica Bucharest – CNMN Centre, Bucharest, Romania**

**Patent**

The design of space vehicles depends crucially upon databases providing the forces, moments, temperatures and heat fluxes along the chosen trajectories. In this respect the thermal-protection system (TPS) used to protect hot structures must tolerate the loads encountered along the trajectory such that the flight remains controllable until the end of space mission.

**Description**

The general aim of the project is to obtain through an enhanced combinatorial EB-PVD deposition technique new thermal coatings layers on a truncated cone base demonstrator for space re-entry vehicles. Selecting the coating materials was done taking into account a matrix of physical-chemical properties (melting temperature, resistance to chemical oxidation) and structural characteristics (minimize the substrate/coating mismatch in the nucleation stage of ad-atoms). Commercial ZrC and ZrB<sub>2</sub> will be initial candidates with additionally Y-doped ZrO<sub>2</sub> and La<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> layers for reducing surface recombination.

*Acknowledgement: Research financed in the frame of Grant from Ministry of Scientific Research and Innovation, RDI Programme for Space Technology and Advanced Research – STAR, project number 528 – ANDROTECH.*





**RO.211.**

**Title** **TRANSLATIONAL PROOF OF CONCEPT OF SPINTRONIC MICRO-NANOPARTICLE NON-THERMAL VIBRATIONAL THERAPY FOR GLIOBLASTOMAS – NANOVIBER**

**Authors** Madalina CURSARU, Roxana Mioara PITICESCU, Robert MOREL, Francois BERGER, Rogerio GASPAR, Stergios LOGOTHETIDIS

**National R&D Institute for Non-ferrous and Rare Metals – IMNR, Pantelimon, Romania**

**Commissariat à l'énergie atomique et aux énergies alternatives (CEA) / Institut Nanosciences et Cryogénie (INAC), France**

**Institution** **Institut National de la Santé et de la Recherche Médicale (Inserm) Unit 1205, France**

**Faculdade de Farmácia da Universidade de Lisboa (FFUL) / iMed.Ulisa, Portugal**

**Aristotle University of Thessaloniki, LTFN Laboratory, Greece**

**Description** Glioblastoma is a disease with high mortality rates. Paramagnetic particles have been extensively used in association with magnetic stimulation to destroy glioblastoma tissues using thermal strategy. Recently, the impact of vibrational non-thermal strategies has been introduced as a new opportunity to treat these tumours. The objective of this project is to boost the preclinical validation and toxicology of these particles, to support more rigorously a large translational program.

This project concerns the study of targeted triggering of cancer cell apoptosis through the vibration of magnetic micro/nanoparticles at low frequencies and in weak magnetic

fields. This biomedical approach is very different from the widely studied hyperthermia, since it relies on a mechanical effect that modifies the ionic transport through the membrane and not on a local heating of the cells. The project deals with a new innovative strategy in Nanomedicine involving new anisotropic magnetic particles and providing a strong added value in the battle against cancer. It paves the way for a new therapeutic opportunity involving the local delivery of vibrational particles inducing a mechano-biological impact inducing tumour cell death.

It is important to control nanoparticle's sizes, surface chemistry, composition, atomic structure which are crucial in the design of nanoparticle-based materials because of their influence on the magnetic properties. Different analytical techniques (Fourier transform infrared spectroscopy; X-ray diffraction analysis; dynamic light scattering; complex thermal analysis; Scanning Electron Microscopy; Transmission Electron Microscopy; inductively coupled plasma optical emission spectrometry; Flame atomic absorption spectroscopy) were employed for structural and thermal characterization of magnetite nanoparticles.

*Acknowledgement: Research financed in the frame of EuroNanoMed II JTC2016, 7<sup>th</sup> Framework Programme, contract UEFISCDI 1/2017.*

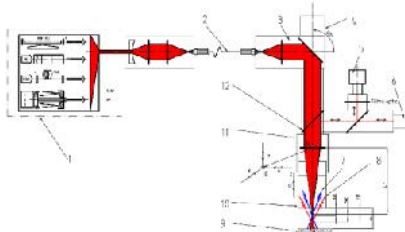
**National Institute for Laser, Plasma & Radiation Physics  
INFLPR**

**RO.212.**

<b>Title</b>	<b>HYBRID METHOD OF RECOVERY AND / OR CREATION OF COMPONENTS BY LASER CLADDING ALLIED WITH NANOPARTICLES</b>
<b>Authors</b>	Popovici Ernest, Mihailescu N. Ion, Mihailescu Cristian, Popescu-Pelin Gianina Florentina, Badiceanu Maria, Ionita Anton, Necsoiu Teodor, Popovici Ioan Razvan, Iliescu Mihaiela, Vladareanu Luige, Stanciu Elena Manuela
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLPR</b>
<b>Patent</b>	OSIM A / 00845 / 26.10.2018
<b>Description</b>	The invention, the hybrid method of recovering and / or creating by laser cladding components by nanoparticle alloying , integrates an LC rational / technically optimized laser cladding system in a pre-existing complementary interdisciplinary system, that becomes through the new configuration, more efficient economic function. The range of components recovered through hybrid processing is comprised of the recovery of unique parts and the recovery of large quantities of used parts resulting from the operation of fleets of transport vehicles, identified in the capital repairing of machine tools, etc. In this way LC and nanotechnology are integrated in technical and financial conditions justified in industry. The hybrid method of recovery and / or creation with laser deposition of components represents a logical succession of phases, steps, defined by: a) the order of the deployment; b) initial conditions; c) parameters, d) technical development conditions and / or technical means used; e) technical conditions of control and / or quality, etc. integrated into a pre-existing technology system in terms of facilities and experience in the interdisciplinary fields involved. The method, hybrid processing consists of a technological activity of a mechanical, physical, chemical, energy transfer which has the effect of obtaining or modifying a product. The method is characterized by well-defined operation steps.
<b>Class</b>	

RO.213.

<b>Title</b>	<b>HYBRID INSTALLATION OF RECOVERY AND / OR CREATION OF COMPONENTS BY LASER CLADDING ALLIED WITH NANOPARTICLES</b>
<b>Authors</b>	Popovici Ernest, Mihailescu N. Ion, Mihailescu Cristian, Popescu-Pelin Gianina Florentina, Badiceanu Maria, Ionita Anton, Gavrilă-Florescu Carmen-Lavinia, Necsoiu Teodor, Popovici Ioan Razvan, Diana Chioibas, Andrei Popescu
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLEPR</b>
<b>Patent no.</b>	OSIM A / 00081 / 11.02.2019
<b>Description</b>	Hybrid installation of recovery and / or creation of components by laser cladding allied with nanoparticles is the technical solution of the problem of integration of LC and nanotechnology in technical and financial conditions justified in industry, with the participation of new parts manufacturers, refurbished parts manufacturers approved for replacement and repair. The installation ensures the obtaining of finite components through the hybrid recovery and / or laser-based creation process by integrating LC and nanotechnology into efficient technical / financial conditions in the industry. LC hybrid system improves the wear / corrosion resistance of components or assemblies. For this LC procedure is compact, adaptive and modular. Can be used with fiber-transferred laser beam, with solid active media / fiber, disk, diode, etc. Areas of application are repairs / made of components in automotive, aviation, defense, etc. industry. The installation is configured according to the main configuration scheme of the installation of hybrid recovery and / or laser-based creation of NP alloyed components, see Fig. 1. and configuration diagrams Fig. 1 and Fig. 3. The installation has customization capabilities, specific to the beneficiary's initial criteria and / or with prospects for future development. The installation is modular and is configured with commercial modules.



**RO.214.**

<b>Title</b>	<b>COAXIAL CONTINUES DEPOSITION HEAD WITH IN SITU SYNTHESIS OF NP</b>
<b>Authors</b>	Popovici Ernest, Mihailescu N. Ion, Mihailescu Cristian, Popescu-Pelin Gianina Florentina, Badiceanu Maria, Ionita Anton, Gavrilă-Florescu Carmen-Lavinia, Necsoiu Teodor, Popovici Ioan Razvan, Diana Chioibas, Andrei Popescu
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLPR</b>
<b>Patent no.</b>	OSIM A / 00126 / 26.02.2019
<b>Description</b>	The invention continues coaxial deposition head with in situ laser synthesis of NP enables the development of a new advanced surface coating technology using the high-power laser beam to increase the reliability and performance of the materials. The invention allows the use of the coaxial continuous head system to use in situ synthesis of NP, exemplified by nano SiC. Low-dilution depositions are obtained; the layers fully and precisely deposited; short processing time that minimizes the spread of heat and heat impact and ensures maximum purity and performance for the cladded layer; improves wear, strength and corrosion performance of components; reduce maintenance costs, etc. Coaxial continuous deposition head combined with in situ synthesis of NP allows a wider alloy band and easier adjustment of precursor parameters and synthesized NP flow. LC with NP have no defects such as cracks or porosity, as opposed to coatings produced by coating only with micrometric powders. This is due to the fact that NP, due to the special physical properties imparted by the nano dimensionality, prevents the propagation of defects in the coating. The in situ nanoparticle-CDS synthesis head is a coaxial continuous feed head with two continuous circular channels. The invention provides isolation of the NP synthesis region.

**RO.215.**

<b>Title</b>	<b>A MULTIVALENT INSTALLATION FOR CLADDING WITH LASER OF FUNCTIONAL LAYERS ON DISC BRAKE</b>
<b>Authors</b>	Popovici Ernest, Mihailescu N. Ion, Mihailescu Cristian, Popescu-Pelin Gianina Florentina, Badiceanu Maria, Ionita Anton, Gavrilă-Florescu Carmen-Lavinia, Necsoiu Teodor,

<b>Institution</b>	Popovici Ioan Razvan, Diana Chioibas, Andrei Popescu <b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLPR</b>
<b>Patent no.</b>	OSIM A / 2019 / 00000
<b>Description</b>	<p>The invention installation of the multivalent laser coating of functional layers on the brake discs makes it possible to implement / apply a new advanced technology to cover the active surfaces of the brake discs with and / or without ventilation using the high power laser beam in order to increase the reliability and the performance of materials as well as satisfying functional properties in better conditions without the use of costly technologies / materials. The invention allows the use of a continuous / discontinuous coaxial deposition head with in situ NP synthesis, exemplified by nano SiC. The invention allows to perform a real-time parameter control of the main parameters of the laser deposition process. Ensure effective temperature control of the deposition process. The constructional features of the brake discs, which can be ventilated or not ventilated with the aspiration of the cooling / heating medium from the outside or inside, are used. The invention provides deposition of cast iron discs with C content within very wide limits. The depositing facility is economically accessible due to the use of the modular system with the use of modules with high technical performance. The deposited material can be qualitatively achieved in a multilayered manner. Composition consisting of a layer of material that provides a good metallurgical bond with the base material and eliminates defects such as pores or microstrip, and multiple layers of material that provide the superior functional characteristics of the brake disk. The installation eliminates one of the major causes of not using the recovery of used brake discs, with wear within acceptable tolerances, with very easy adaptability to the dimensional limits of different constructors as well as materials used in the range of steels and cast iron.</p>

**RO.216.**

<b>Title</b>	<b>Procedure for laser microtexturing of a sliding bearing</b>
<b>Authors</b>	Gheorghe Cristian, Olteanu Petre, Stan Cristian Giorgian, Cristian Viespe, Miu Dana Maria, Nicolae Ionut, Predescu Adrian, Marian Victor Gabriel, Stoica Nicolae Alexandru

<b>Institution</b>	<b>SC JNO GROUP SRL, NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS, UNIVERSITY POLITEHNICA OF BUCHAREST</b>
<b>Project</b>	National PATENT APPLICATION A/00164/08.03.2018
<b>Description</b>	The invention refers to a microtexturing procedure, using a picosecond laser, of a sliding bearing, part of construction equipment, in order to improve its tribological properties. As a result of the microtexturing procedure, the sliding bearing has increased reliability due to better wear properties. The procedure produces a network of cylindrical micro-cavities on the surface of the mechanical part. This network forms an optimized texturing geometry, which improves the tribological properties of the sliding bearing. The procedure ensures a high precision and speed of processing for mechanical parts having a cylindrical symmetry, which have a relatively large mass and surface.

**RO.217.**

<b>Title</b>	<b>Physical immobilization procedure for Ache enzyme within Polyethyleimine polymeric membrane for enhanced active elements within chemical/gas sensors applications</b>
<b>Authors</b>	Dinca V., Viespe C., Scarisoreanu N.D., Brajnicov S., Bonciu A., Ion V., Dinescu M.
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS</b>
<b>Patent no.</b>	National patent application A/00817/14.10.2018
<b>Description</b>	The invention relates to a physical immobilization process of the Acetylcholinesterase-ACHe enzyme in a polyethyleneimine-PEI polymer layer for obtaining an composite membrane with improved response to the Dimethyl methylphosphonate-DMMP. The enzyme immobilization process consists in using laser evaporation and an ACHE-PEI double target system, where the laser beam is scanned on the surface of the target to evaporate the two compounds within the same deposit. PEI-ACHE composite membranes deposited on SAW sensors and DMMP-tested were obtained. The process can be applied for the immobilization of biologically active compounds in polymeric membranes with applications in tissue engineering, biosensors, chemical sensors. It is demonstrated the feasibility of obtaining hybrid polymer-enzyme active interfaces for PEI-AchE sensors by

using MAPLE and a modular target system. The two different configurations of PEI-AchE depositions were characterized by SEM and AFM, and revealed smooth surfaces, except for the presence of nm-sized pores in the case of the hybrid surfaces. The inclusion of AchE within the PEI coating played a major role in increasing the measurement sensitivity for both DIMP and DMMP detection. This demonstrates that the enzymes and polymer deposited by MAPLE can provide good premises for the development of a sensor with suitable stability, good reproducibility, and high sensitivity toward DMMP and DIMP. Such a laser-based coating deposition approach demonstrates the great potential of PEI-AchE-based enzymatic interfaces in a sensing system, with potential perspectives to be used for biomedical and clinical diagnostic applications.

**Class** 12

**RO.218.**

**Title** Thermal treatment procedure of oxide thin films for photovoltaic cell electrodes

**Authors** Petronela Garoi, Cristian Viespe, Florin Garoi, Crăciun Valentin

**Institution** NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS

**Patent no.** National PATENT APPLICATION RO-BOPI 5/2018, A/00439/30.05.2018, Number 130768 B1

**Description** The invention refers to a heat treatment procedure applied to ITO and SnO<sub>2</sub> thin films. The procedure consists in heating the oxide films in an open atmosphere at a temperature of 400 °C (with a rate of 5 °C/min) for 30 minutes, then they are cooled to 350 °C (with a rate of 3 °C/min), where they are maintained for 120 minutes and, finally cooled again to room temperature (with a rate of 5 °C/min) (Figure 1a). The effects of annealing were highlighted in the increase of size of crystallites and surface morphology of the thin films. Therefore, structural parameters depend on the annealing conditions and are investigated by X-ray diffraction (XRD), atomic force microscopy (AFM) and scanning electron microscopy (SEM) analyses. To obtain active elements for chalcogenide solar cells deposited on flexible substrates, we used step by step techniques (e.g. the component layers are



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deposited successively). This process can be applied to obtain flexible conductive and transparent electrodes with improved optoelectronic qualities, to be integrated into realization of photovoltaic cells.

**Class** 2

### RO.219.

**Title** Procedure for obtaining nanoporous multilayer SnO<sub>2</sub>/Co<sub>3</sub>O<sub>4</sub> thin films for the detection of ammonia, using laser methods

**Authors** Cristian Viespe, Dana Miu, Izabela Constantinoiu

**Institution** NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS

**Patent no.** National Patent Application A/00035/23.01.2019

**Description** The invention refers to a procedure for obtaining, using laser methods, of nanoporous multilayer SnO<sub>2</sub>/Co<sub>3</sub>O<sub>4</sub> thin films, applicable as sensitive films for Surface Acoustic Wave Sensors, for the detection of ammonia. As a result of the procedure for obtaining the film, the sensors have improved sensitivity, selectivity, response and recovery times, for the detection of ammonia. The multilayer structure combines selectivity to ammonia, due to Co<sub>3</sub>O<sub>4</sub> with high sensitivity, due to SnO<sub>2</sub>. The structure also combines the mass and acoustoelectrical effect of Surface Acoustic Wave Sensors. The sensor was tested at room temperature in the presence of ammonia, methanol and toluene, at various concentrations. The best response was obtained in the presence of ammonia

**Class** 12

### RO.220.

**Title** 2D nanostructured graphene-based films manufactured via the laser pyrolysis of solid polymeric substrates

**Authors** Athanasios Tiliakos, Ioan Stamatin, Adriana Balan, Ana Cucu

**Institution** National Institute for Laser, Plasma & Radiation Physics | University of Bucharest

**Patent no.** Patent application No. A/00662/21.09.2016

**Description** We have designed a rapid single-step method for manufacturing graphenic films through the laser pyrolysis of solid polymeric substrates by using commercial laser CNC cutter/engravers.

The method has been originally applied on inexpensive

commercial polyimide precursors (e.g. Kapton<sup>®</sup>, Pyralux<sup>®</sup>); polyetherimides and polysulfones are also compatible. Laser pyrolysis of such materials results in the photothermal decomposition of their polymeric matrix through the high heat localization produced by the pulsed laser irradiation, resulting in aromatic units evaporating and precipitating into interconnected graphenic foams of high conductivity and porosity. These assemble into stable thin films with thickness ranging from 20 to 200 microns, and lateral dimensions determined by the starting polymeric films and the available processing area of the laser engraving equipment. The physical properties of the resulting graphenic films can be tailored by surface patterning through the appropriate selection of laser operating parameters. This allows for the full control of surface roughness and thus hydrophobicity: graphenic films can be tailored to be superhydrophilic or superhydrophobic according to the demands of the application. We have used laser-induced graphenic films with tailored surface properties for energy storage and conversion applications. These include: laser-printed graphenic electrodes of elaborate geometries for electrochemical supercapacitors, and graphenic porous electrodes for PEM fuel cells. Other possible applications include sensors, oxygen electrocatalysis, water splitting, FETs etc.

Class

7

RO.221.

Title

*Composite carbon xerogels with graphene oxide and their manufacturing process*

Authors

Stamatin Ioan, Trefilov Alexandra-Maria-Isabel, Balan Adriana-Elena, Nichita Cornelia, Iordache Stefan-Marian

Institution

University of Bucharest

Patent no.

RO 130237/2018

Description

The invention relates to a process for the production of high-quality composite carbon xerogels based on reduced graphene which exhibits improved properties: increased carbon purity, low resistivity, low density, and high retention capacity.

The process according to the invention consists in the sol-gel synthesis of resorcinol and formaldehyde solution in the presence of graphene oxide which simultaneously performs

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the role of the reaction catalyst and of the active component. After the pyrolysis step the obtained carbonic xerogel with graphene is investigated by morphological, structural and electrical measurements.

The product according to the invention presents high purity carbon content and increased electrical conductivity which highlights the possibility of application in energy devices. Thus, they can be electrodes in batteries and supercapacitors, gas diffusion layer (GDL) or carbon support in fuel cells and support for hydrogen storage.

**Class** 2

### RO.222.

**Title** Vitreous potassium-phosphate fertilizers and method for obtaining them  
**Authors** Bogdan Alexandru Sava, Lucica Boroica, Mihai Sava, Mihail Elisa  
**Institution** National Institute for Laser, Plasma and Radiation Physics Magurele  
**Patent no.** RO 128736 B1, 28/09/2018

**Description** The invention relates to vitreous potassium-phosphate oxidic fertilizers products for agriculture and to the process for their production. Oxides, salts or complex combinations thereof are used which introduce phosphorus oxide, potassium oxide, magnesium oxide and calcium oxides, as well as additives like boron, iron, zinc, molybdenum, manganese, vanadium oxide, copper and / or cobalt oxides. These materials are granulated, ground, sieved, homogenized, heat treated between 900 and 1200°C, and the material obtained is rapidly cooled, dried, grounded and granulometrically screened to granules specific to the type of culture and solvation time.  
Applications: Ecological Agriculture, grain, corn, vegetables, vineyard

**Class** 3

### RO.223.

**Title** Boron-phosphate glass with magneto-optical properties and method for obtaining them  
**Authors** Bogdan Alexandru Sava, Lucica Boroica, Mihail Elisa, Dumitru Ulieru, Doina Craciun

<b>Institution</b>	<b>National Institute for Laser, Plasma and Radiation Physics Magurele</b>
<b>Patent no.</b>	Patent application A/01008/2016
<b>Description</b>	<p>The invention relates to the doped boro-phosphate glass product containing boron oxide, phosphorus oxide, lithium oxide, aluminum oxide, zinc oxide, together with oxides introduced singly or in pairs: cobalt oxide, iron oxide, vanadium oxide, zirconium oxide, niobium oxide, molybdenum oxide, tungsten oxide, tin oxide, antimony oxide, lead oxide, bismuth oxide, Tb<sub>2</sub>O<sub>3</sub>, Dy<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Eu<sub>2</sub>O<sub>3</sub>, Pr<sub>2</sub>O<sub>3</sub>, Nd<sub>2</sub>O<sub>3</sub>, Sm<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub> and the process for their preparation, by wet preparation of the mixture of raw materials, pre-melting, melting, tempering, conditioning, casting, annealing, shaping.</p> <p>Applications: Faraday rotators, laser mirrors, magneto-optical devices</p>

**RO.224.**

<b>Title</b>	<p><b>Intellectual property and database in the project: New advanced surface coating technologies using high power laser beam to increase reliability and performance of materials – PRELAM - Competitiveness Operational Program</b></p>
<b>Authors</b>	Besenyei Niculina Mirela, Badiceanu Maria, Hapenciuclaudiu, Ionita Anton, Mihailescu Ion, Mihailescu Cristian, Negut Irina, Oane Mihai, Opran Marius, Popescu-Pelin Gianina, Popovici Ernest, Ristoscu Carmen
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLPR</b>
<b>Patent no.</b>	
<b>Description</b>	<p>The PRELAM project generates intellectual property by proposing substitution of critical materials and increasing the service life of components through functional coatings. Specific methodologies and working protocols are developed for a broad class of substrate materials and implanted materials, giving major attention to metals, composite materials and nanomaterials. They are interested in the academic environment represented by the National Institutes, but not only, which carry out research and development activities in the field of metal or nanomaterial treatment, and companies of different sizes and status are final users of the</p>

results. Thanks to countless applications that incorporate nanoparticles, research directions in this regard are unlimited. The valorisation of the results of the research activities is achieved through the capitalization of the intellectual property and their assimilation in the database and respectively by the use of the data from the database as the launching pad for the achievement of intellectual property.

Within the project a systematization of the INFLPR domain information was made in a unitary database that can be used on a commercial basis within the project, more precisely within the B activities. The new database contains the latest results in the state of the art. Thanks to the database management system is accessible and can be used successfully in project activities. Due to the bidirectional relationship between intellectual property and the database, there is a permanent maintenance and information / data request. The realization of the database and concerns in the field of intellectual property made it possible to capitalize on the exceptional interdisciplinary results obtained in the current / actual technical fields of INFLPR. It is possible to highlight the fields of laser technology and nanotechnology. In these areas it was possible to achieve intellectual property with project applications in the process of transfer of the specified technology.

**RO.225.**

<b>Title</b>	<b>Subsidiary contracts as a source of intellectual property and areas of application of laser cladding of materials by technological transfer: New advanced surface coating technologies using high power laser beam to increase reliability and performance of materials - PRELAM</b>
<b>Authors</b>	<b>INFLPR:</b> Besenyei Niculina Mirela, Badiceanu Maria, Hapenciu Claudiu, Ionita Anton, Mihailescu Ion, Mihailescu Cristian, Negut Irina, Oane Mihai, Opran Marius, Popescu-Pelin Gianina, Popovici Ernest, Ristoscu Carmen
<b>Institution</b>	<b>OPTOELECTRONICA 2001:</b> Necsoiu Teodor, Stanciu Elena Manuela, Ghidan Laura, Enuica Alexandra, Comanescu Brindus, Popovici Ioan – Razvan, Vlad Melu
<b>Patent no.</b>	<b>NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS - INFLPR</b>

**Description**

The subsidiary contract between INFLPR and OPTOELECTRONICA 2001 solves the technological transfer through effective collaborative research that uses the knowledge of everyone in the field and takes into account the needs and requirements of the company. Under the contract, a hybrid laser recovery and / or laser-based process was developed for nanoparticle alloying components, with the following advantages reported prior to the state of the art. It integrates a rational / optimized LC system from a technical point of view into a pre-existing complementary interdisciplinary system, which becomes via the new function more economically efficient. Hybrid laser recovery and / or laser-based processing of nanoparticle alloy components is characterized by a high level of interdisciplinary application: applied engineering, information engineering, industrial engineering, mechatronics engineering, management engineering, nano-engineering, engineering engineering , system engineering, etc. It also makes it possible for external beneficiaries to process the company by providing certified quality by presenting the qualitative / quantitative guarantees required by the beneficiaries, through existing complementary interdisciplinary facilities. The hybrid method of recovery and / or creation with laser deposition of components represents a logical succession of stages, phases, steps, defined by: a) the order of the deployment; b) initial conditions; c) parameters, d) technical development conditions and / or technical means used; e) technical conditions of control and / or quality, etc. integrated into a pre-existing technology system in terms of facilities and experience in the interdisciplinary fields involved. The method, hybrid processing consists of a technological activity of a mechanical, physical, chemical, energy transfer which has the effect of obtaining or modifying a product. The method is characterized by well-defined operation steps. The hybrid laser recovery and / or laser deposition method of nanoparticle alloying components allows direct in-situ synthesis in the deposition area of the deposited nanoparticle material, produced by their synthesis with the laser used in the deposition process.

**Class**

**Institute of Chemistry Timisoara  
of Romanian Academy**

RO.226.

**Title** Phosphonate Metal Organic Frameworks as Heterogeneous Catalyst in Sustainable Green Solvent

**Authors** Aurelia VISA<sup>1</sup>, Bianca MARANESCU<sup>1</sup>, Fabio ARICO<sup>2</sup>  
<sup>1</sup>Institute of Chemistry „Coriolan Drăgulescu”, 24 M. Viteazu Ave., 300223, Timișoara, Romania

**Institution** <sup>2</sup>Cà Foscari University of Venice, Department of Environmental Science, Informatics and Statistics, 2137 Dorsoduro, 30123 Venice, Italy

**Description**

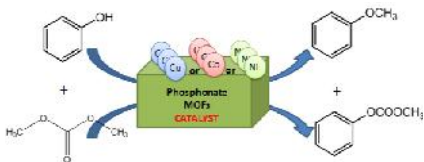
The growth of new materials needs to take into account that the fabrication methods must be friendly to environment, scalable, robust, and cost effective. Metal organic frameworks (MOFs), a hugely studied class of porous materials, containing different types of central metal ions attached to organic linkers, are used in various applications such as catalysis, photochemistry, proton conductivity, absorption, corrosion protection, sensoristic science etc. Phosphonates metal organic frameworks synthesized in our research group take care about environment (the synthesis are performed in water) and also the application as methylation reactions heterogeneous catalyst are performed in green solvent – dimethylcarbonate.

**Advantages:** The architectural assemblies of MOFs provide special properties as *high thermal and mechanical stability, high surface areas and large pore sizes* giving to these materials new applications. Dimethyl carbonate (DMC), an environmentally mild reagent and solvent for chemical syntheses, has been used to *O*-methylation of phenol,  $\beta$ -naphthol and *N*-methylation of aniline. DMC serves as a methoxycarbonylation agent and it was also the reaction solvent.

**Applications:** Phosphonates metal organic frameworks used as heterogenous are promising candidates for methylation reactions being easy recoverable and reusable at least 5 cycles.

*Acknowledgments:* This research was partially funded through the Program no 2, Project no. 2.3 from the Institute

of Chemistry “Coriolan Dragulescu” and by a grant of Ministry of Research and Innovation, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2016-2008, within PNCDI III.



RO.227.

**Title**

### Rare Earth Elements Removal from Aqueous Solutions by Phosphonates Metal Organic Frameworks

**Authors**Lavinia Lupa<sup>1,2</sup>, Bianca Maranescu<sup>1</sup>, Aurelia Visa<sup>1</sup>**Institution**<sup>1</sup>Institute of Chemistry „Coriolan Drăgulescu”, 24 M. Viteazu Ave., 300223, Timișoara, Romania<sup>2</sup>Faculty of Industrial Chemistry and Environmental Engineering, University Politehnica Timisoara, 2 Piata Victoriei, 300006, Timisoara, Romania**Description**

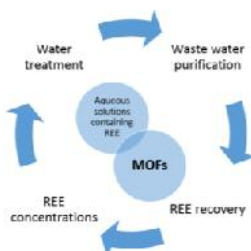
Rare earth elements (REE) present importance due to their application in various fields of industry, but in the same time could be toxic if reach environment samples. From these reasons REE should be removed and recovered from various waste flows. The project presents new suitable adsorbent, the phosphonate metal organic frameworks (phosphonate MOFs). Their porous structure allows the target metal to diffuse and the pore's shapes and sizes confer them selectivity for various metals. Therefore phosphonates MOFs are suitable to be used as adsorbent materials of REE from aqueous solutions. In the project a correlation between the structure of various phosphonate MOFs and the target pollutants have been discussed. Different metal (Cu, Co, Ni, Zn etc.) cluster and different organic ligands (vinylphosphonic acid, styrylphosphonic acid and phosphonoacetic acid) and various coligands (imidazole and 1,10-phenantroline) have been used to obtain various phosphonate MOFs, which were used in the elimination process of Cs, Tl, Sr, Eu. It was observed that both the metal ions and the organic moiety ligand and coligands from the phosphonate MOFs structure, has a significant influence upon the adsorption capacity of the obtained MOF in the removal process of the studied REE.



**Applications:** Water and waste water treatment, recovery and concentration of REE from various secondary sources.

**Advantages:** Phosphonate MOFs present higher adsorption capacity and higher selectivity in the removal process of REE from aqueous solutions than other adsorbents presented in literature.

*Acknowledgments:* This research was supported by a grant of Ministry of Research and Innovation, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2016-2008, within PNCDI III.



RO.228.

**Title**

**Phosphonic Acid and Phosphonate Metal Organic Framework as Cheap, Safe and Easy to Handle with Potentially Retarded Corrosion Inhibiting Effect**

**Authors**

Bianca MARANESCU, Nicoleta PLESU, Aurelia VISA

**Institution**

Institute of Chemistry "Coriolan Dragulescu", 24 Mihai Viteazul Bdv., 300223 Timisoara, Romania

**Description**

Phosphonates were established as scale inhibitors with negligible environment impact in water treatment. Information about the use of phosphonates as corrosion inhibitors as a corrosion inhibitor for mild steel in a HCl medium was reported. The unsaturated vinyl phosphonic acid (VP) and the corresponding phosphonates metal organic frameworks with cobalt were found to be a good candidate in corrosion protection of iron. The phosphonates metal organic frameworks (MOFs) containing cobalt (CoVP) is more suitable and effective in comparison with phosphonates metal organic frameworks (MOFs) with zinc Co(VP). The optimum concentration of CoVP is 2mM, sufficient to generate the corresponding of free phosphonic acid and to form a complete and compact layer on iron surface. It is easy to obtain in laboratory at cost effective and easy to

manipulate.

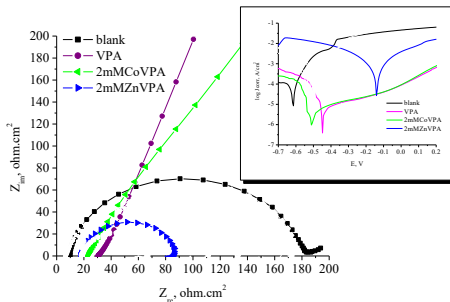
Advantages:

It was found that phosphonate MOFs are able to release in time phosphonic acid and could hindrance the corrosion of iron and for this reason retard the effect and the extension in action of these kinds of corrosion inhibitors are expected, which may have a positive impact on the economics.

Applications:

Results of this study can be applied in production of phosphonate MOFs like candidates for corrosion inhibitors for iron in saline and acid solutions.

*Acknowledgments:* This research was partially supported by Program no 2, Project no. 2.3 from the Institute of Chemistry “Coriolan Dragulescu” and by a grant of Ministry of Research and Innovation, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2016-2008, within PNCDI III.



## National Research & Development Institute for Welding and Material Testing - ISIM Timisoara

**RO.229.**

**Title**

**Hybrid Equipment for Processing Polymer Composite Materials**

**Authors**

Octavian Victor Oanca, Nicușor-Alin Sirbu, Gabriela-Victoria Mnerie, Emilia Florina Binchiciu

**Institution**

**National R&D Institute for Welding and Material Testing – ISIM Timisoara**

**Patent no.**

Patent application No. A/00792/11.10.2018

The equipment consists of a resistance frame, an ultrasonic tool drive system, a blank loading module, an electric command and control system, a blank advance module, a processed blank packaging and storing system, a blank control system, a PVC wrapping system, a blank heating system (thermal anvil).

Equipment operating mode: the blank support system is supplied with polymer composite materials; the support system is loaded on the equipment; blanks are guided towards the processing module. Blank hybrid cutting/sealing operation is performed by lowering the horn and activating ultrasound, after heating the thermal anvil. Following is the one-step movement of processed blanks towards packaging, on a roller, with PVC foil that sustain them. After processed blanks are rolled, the wrapping system is discharged and another roll is mounted on, work cycles can continue.

**Description**

The equipments advantages are:

- Processed surfaces do not fringe, they appear as two strait cut strips; surfaces are not blackened or have color degradation;
- Processing time, as a sum of intermediate times, is lower than classic operation; the hybrid solution has a better processing yield, desirable for mass and/or series production.
- After cutting and sealing, processed blanks are wrapped and stored in a PVC support system, that favors fast loading and exhaust time, raising the overall productivity.
- The equipment can be adapted with specialized modules and/or tools, in order to process different size blanks, obtaining a range of specialized processing equipments. The hybrid equipment, standard or enhanced function to blank requirements widens processing range.

**Class**

2,5,9



**RO.230.**

**Title**

**Ultrasonic processing center**

**Authors**

Nicușor-Alin Sîrbu, Victor Verbitchi

**Institution**

**National R&D Institute for Welding and Material Testing – ISIM Timisoara**

**Patent no.**

Patent application No. A2019 00242

**Description**

The invention relates to an ultrasonic-based center for processing by welding. The ultrasonic processing center, according to the invention, has the following main components: ultrasonic welding installation; robot arm, for handling, positioning and fastening of tools and blank products; robot control unit; storing shelf for parts and blanks that will be welded; work-tool shelf, for sonotrodes and anvils, used to weld blank products; welded parts storing shelf.

The ultrasonic processing center has the following programming possibilities, achieved by means of a combined center-specific model program:

- Programming the movement of sonotrodes, blank products that are to be welded, respectively welded parts;
- Programming a vertical motion function of the work-tool (sonotrode), correlated with the size of the blank products that will be welded;
- Programming a function for point-to-point contact of the sonotrode with blank product that are to be welded;
- Programming complete welding cycles for several types of

parts.

Detailed components: 1. Blank shelf for ultrasonic welding; 2. Mobile robot arm; 2a. Robot's control unit; 2.9. Clamping mechanism (external axis 8); 3. Ultrasonic welding installation; 3.8. Sonotrode for ultrasonic welding; 3.9a. Blank product (or part) (a) to be welded; 3.9b. Blank product (b) for welding; 4. Ultrasonic horn shelf; 5. Ultrasonic-welded parts shelf.

**Class**

5

**RO.231.**

**Title**

**Hybrid Equipment for Processing Polymer Composite Materials**

**Authors**

Octavian Victor Oanca, Nicușor-Alin Sîrbu, Gabriela-Victoria Mneric, Emilia Florina Binchiciu

**Institution**

**National R&D Institute for Welding and Material Testing – ISIM Timisoara**

**Description**

ISIM Timisoara designed and developed a functional model of a hybrid processing equipment, combining an ultrasonic assemble and thermal anvil, in order to process polymeric composite blanks, with no defects, impurities or burns, while using a green processing technology that has no emissions.

The equipment has several advantages, such as: processed surfaces do not fringe, they appear as two straight cut strips; surfaces are not blackened or have color degradation; processing time, as a sum of intermediate times, is lower than classic operation; the hybrid solution has a better processing yield; after cutting and sealing, processed blanks are wrapped and stored, fact that favors fast loading and exhaust time, raising the overall productivity.

The equipment can be adapted with specialized modules and/or tools, in order to process different size blanks, obtaining a range of specialized processing equipments and/or specialized modules, which widens processing range.

The hybrid equipment is suitable to be used in various industries, such as textile, for cutting and/or sealing textiles, polymers, composite, natural and/or synthetic leather; in the automotive industry, for processing seatbelts, cables and so on; in the consumer industry for cutting and sealing various polymeric packaging materials.

Invention Classification: 2, 5,9

## SC MINET SA

RO.232.

<b>Title</b>	Unconventional textile fabric based on wool, from Romanian breeds, for insulation of the constructions and method of obtaining it.
<b>Authors</b>	Bulacu Cezar-Florin, Meita Vasile, Petcu Cristian, Vasile Vasilica, Zaharia Marta-Cristina, Dorogan Angela, Carpus Eftalea, Ghituleasa Carmne-Pyrena, Zaharia Marta-Cristina, Enciu Ana.
<b>Institution</b>	<b>SC MINET SA, INCD URBAN-INCERC, INCDTP</b>
<b>Patent no.</b>	Patent application No A/10034 din 30.07.2018
<b>Description</b>	<p>The present invention relates to an unconventional textile fabric based on wool from Romanian breeds or other breeds with similar histological characteristics for use in the field of building insulation and interior design as well as to a process for obtaining it.</p> <p>It also relates the formation of the three-dimensional, non-woven fibrous layer by aerodynamic procedure with a fiber positioning so that it can enclose a volume of air between the fibers of the structure so that at a certain density a very good thermal conductivity can be obtained.</p> <p>In the present case, based on the specific fiber characteristics, it has been found that wool fibers of the Turcana sheep breed give spectacular results in their use for making an insulating material with an optimum mass density in relation to the thickness of the material to ensure a minimum thermal conductivity of the material. At the same time, it was intended to ensure the dimensional stability of the insulating material.</p> <p>The advantages of the present invention derive primarily from the use of natural wool sheep wool which is itself an environmentally friendly, non-polluting, biodegradable, flame-retardant, resistant pest and mold, with absorbent properties, including volatile organic compounds (VOCs) at risk for human health.</p> <p>Applications: Thermal and acoustic insulation especially in the cavities of roofing, indoor and outdoor walls, particularly for wooden construction. Also, the unconventional textile material based on wool is used for the manufacture of panels, architectural elements of the three-dimensional type with the role of lining and insulation of building or decoration.</p>

Appropriate for both new construction and renovation works, available in different thicknesses and measures, depending on the requirements of your application. The innovative properties is the absorption and eliminate volatile organic compounds (VOCs) like formaldehyde from the rooms.

**Class**

7

**RO.233.**

**Title**

**IZOMIN – Ecological solution that integrates low quality of wool in a valuable natural insulation material with characteristic to purify indoor air from sustainable constructions**

**Authors**

Bulacu Cezar-Florin,

**Institution**

SC MINET SA

**Patent no.**

-

The paradigm change in our society – away from one-sided economic growth and towards more quality of life – also plays a role that should not be underestimated.

Buildings and services improved from point of view of sustainability also increase our quality of life, comfort and often our safety and security too.

Indoor air constitutes a complex case for risk assessment and management due to a wide variety of pollutants, exposure levels, different possible health outcomes, differences in sensitivity of the population, cultural habits, way of living, building stock and climate across Europe.

Worldwide, in the past years, the climate change was linked to the high level of CO<sub>2</sub> and our houses, office buildings and old constructions are responsible for 40% of them. The greenhouses gas emissions due to energy loss guilty for these alarming changes. IZOMIN - the natural insulation fights the problem because it stores CO<sub>2</sub>, while it also absorbs and eliminate formaldehyde, a carcinogen emitted by some buildings products and the most famous volatile organic compound.

**Description**

IZOMIN contains 85% pure sheep wool which come from the Turcane breed. We use the thinker part of the treads, the part that usually goes to waste because it's not good for the traditional textile industry.

The advantages of the present invention derive primarily from the use of natural wool sheep wool which is itself an environmentally friendly, non-polluting, biodegradable,

flame-retardant, resistant pest and mold, antimicrobial, with absorbent properties, including volatile organic compounds (VOCs) at risk for human health. All the tests were performed by Eurofins Product Testing in Denmark according to ISO 1600-23: 2018 Indoor air – part 23: performance test for evaluating the reduction of formaldehyde and other carbonyl compounds concentrations by sorptive building materials.

Applications: With a very large utility and a very low environmental impact, unconventional technical textile (nonwoven) provides a strategic direction for the sustainable development of textile sector.

Can be used sources of waste of wool in the nonwoven with technical destination thereby to develop and diversify other sustainable sectors of economy.

Thermal and acoustic insulation with indoor air purification characteristic, especially in the cavities of roofing, indoor walls or like unconventional textile material for the manufacture of panels, architectural elements of the three-dimensional type with the role of lining and insulation of building or decoration.

Appropriate for both new construction and renovation works, available in different thicknesses and measures, depending on the requirements of your application.

To highlight the innovative proprieties that absorption and eliminate volatile organic compounds (VOCs) like formaldehyde from the rooms.

**Class**

7



**National Institute for Research and Development in  
Constructions, Urbanism and Sustainable Spatial  
Development URBAN-INCERC, Bucharest, Romania**

RO.235.

Title EN

**Nature-based solutions for a sustainable urban development**

Authors

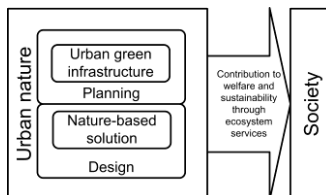
*Alexandru-Ionuț PETRIȘOR, Vasile MEIȚĂ*

Institution

**National Institute for Research and Development in  
Constructions, Urbanism and Sustainable Spatial  
Development URBAN-INCERC, Bucharest, Romania**

Description  
EN

Nature-based solutions can expand the existing urban green infrastructure and help restoring its interconnectedness, improving the level of ecosystem services provided by it to the citizens and contributing this way to improving their welfare, comfort and safety, and creating the premises for a sustainable urban development. The modern understanding of cities, influenced by the progress of urban ecology, sees them as socio-ecological complexes where the natural components form a green infrastructure providing ecosystem services to the human population forming their anthropic component. Planners can influence decisively the relationship of the two. Unwise planning or no planning result into the fragmentation of the urban green infrastructure by human activities, resulting into a quantitative and qualitative decrease of the ecosystem services delivered by it, and a negative influence on the welfare and comfort of city dwellers. Proper planning, accounting for the urban green infrastructure and its interconnectedness, enhancing the ecosystem services and contributing to the urban sustainability. Therefore, planners can turn the vicious circle into a virtuous one. Architects and designers contribute to the process through intimate details based on the adoption of nature-based solutions in the design process, contributing to expanding the urban green infrastructure and enhancing its interconnectedness.



RO.236.

<b>Title EN</b>	<b>Ensuring the health and safety of the population in the concept of open innovation</b>
<b>Authors</b>	Eng. Mihaela ION <sup>1</sup> , PhD Student Eng.Vasilica VASILE <sup>1,2</sup> , Eng. Cora STAMATE <sup>1</sup> , Eng. Mariana CIONCU-PUENEA <sup>1</sup>
<b>Institution</b>	<sup>1</sup> National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, INCERC Bucharest Branch <sup>2</sup> Technical University of Civil Engineering, Faculty of Building Services
<b>Description EN</b>	<p><i>The context.</i> Research and innovation are key to a modern and successful economy and they are at the center of the European Commission's policies to stimulate jobs, growth and investment. The concept of open innovation is one of the three pillars of the European research program HORIZON EUROPE, a concept introduced to open up the innovation process to all active players so as to ensure the free transfer of new ideas, to transform them into products and services and to create new markets.</p> <p>Lately, the world economy is experiencing low economic growth, with industry experts considering concepts such as openness, convergence and creating new market demand through emerging technologies (i.e. Internet of Thing - IoT, Artificial Intelligence) capable of solving the current economic crisis around the world. Many innovations originating from developing countries being ultra-low cost, durable, easy to use, based on natural raw materials and minimize environmental impact, they are well suited to ensuring health and safety of the population, under growing pressure to achieve better outcomes at significantly lower costs.</p> <p><i>Conclusions.</i> Open innovation is considered to be the latest company philosophy implemented to combine internal research, expertise and capabilities with external expertise, expertise to accelerate innovation in product and technology development. Open innovation forms a unique foundation for academia and industry to enhance connections with Research-Development institutions. Stimulating a certain type of economic behavior, diversifying the ways of capitalizing on natural materials in an innovative context, taking into account the requirements of the European Union, can be achieved by implementing the principles of open innovation, all the more so as this capitalization responds to the areas of interest referring to the health and safety of the population.</p>

RO.237.

<b>Title EN</b>	<b>Acoustic characteristics of human footsteps noise transmitted through a type of floor and human psychoacoustic perception</b>
<b>Authors</b>	<b>Marta Cristina ZAHARIA</b> , Ioana Mihaela ALEXE, Ciprian ENE, Melania CRUCEANU
<b>Institution</b>	<b>NIRD URBAN-INCERC, Branch INCERC Bucharest, INCERC Laboratory of Research and testing for Energy Performance of Buildings, Building Systems and Building Acoustics</b>
<b>Description EN</b>	<p>In Romania, there were made research and studies about human psychoacoustic perception of the noise produced by human footsteps on a type of floor and transmitted through it, and there were conducted during 2018, in project PN 18-35.03.03, Phase1, concluded with MCI.</p> <p>The studies performed about the types of noise sources that can act in buildings, produced from usual human activities that are common in civil buildings with different destinations; These noise sources may affect human health under certain conditions of repeatability of their production and psychoacoustic sensitivity of human receptors. A selected source of noise for study was walking, produced by footsteps, on the floor in office rooms.</p> <p>Experimental acoustic measurements were made in the impact noise isolation stand, where several human subjects walked on foot with various types of footwear on an experimental floor; The noise produced by the steps was recorded in the emission and in the reception room, and the results of the acoustic characteristics (spectra, noise levels) obtained, for 16 cases, were studied considered the psychoacoustic perception of the people, for the noise produced and received.</p> <p>The results of the acoustic measurements were presented, show that:</p> <ol style="list-style-type: none"> <li>1) people's psychoacoustic perception is that the received noise is predominantly disturbing, especially for the resonant frequency zones of the graphs obtained for step noise on a floor;</li> <li>2) the production of psychoacoustic discomfort for humans is due to the existence of a significant difference, of 8...10...30dB, between the minimum and maximum values of the received noise level.</li> </ol> <p>Conclusion: The psychoacoustic perception of noise by human subjects is very subjective; depends largely on the psychological sensitivity of each person, on the temperament of the person, on education, on the living environment and on the professional environment (i.e. a profession requiring intellectual concentration compared to a profession requiring mainly physical work).</p>

**RO.238.**

<b>Title EN</b>	<b>Innovative methods for harnessing thermal-insulation materials composed of vegetable fibers</b>
<b>Authors</b>	Monica CHERECHEȘ, Alina COBZARU, Adrian CIOBANU, Aurelia BRADU, Florina FILIP, Constantin MIRON, Ionel PUSCASU
<b>Institution</b>	<b>National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development “URBAN-INCERC” Iasi Branch</b>
<b>Description EN</b>	<p>Building materials, which can be genuinely called sustainable, are those that have proven their ability to sustainably serve the development along the life of human society, meeting the needs of the present and providing future generations with a natural environment, permanently clean and unaltered.</p> <p><i>Applications:</i> The thermal-insulation materials <i>composed of renewable resources such as vegetable fibers</i> have a <i>valuable benefit for a healthy and comfortable habitat</i> as alternative to other synthetic materials commonly used such as <i>mineral wool, polystyrene or polyurethane</i>.</p> <p>Our current innovative scientific research aimed to use local agro resources <i>to develop new composed insulating materials from vegetable fibers</i> as renewable resources, with comparable physical and mechanical properties to commonly used synthetic insulations materials.</p> <p><i>Advantages:</i> Owing the innovative methods to develop the technology for harnessing thermal-insulation materials composed of vegetable fibers we can say that <i>thermal insulation made from vegetable fibers</i> in the near future must become a healthier alternative to the sick building syndrome and the commonly used synthetic materials.</p>

**RO.239.**

<b>Title EN</b>	<b>Innovative platform tests for vital infrastructure certification to extreme climatic actions</b>
<b>Authors</b>	Constantin MIRON, Adrian CIOBANU, Aurelia BRADU, Ionel PUSCASU, Monica CHERECHEȘ, Alina COBZARU, Florina FILIP
<b>Institution</b>	<b>National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development “URBAN-INCERC” Iasi Branch</b>
<b>Description</b>	The innovative research <i>platform for testing and certification</i>

- EN** of new products in the fields of *vital infrastructure to extreme climatic actions* (Fig. 1) is a section of INCERC Laboratory for Seismic and Climate Research and Testing in Iasi. It has become the largest and most modern climate research facility in the South East Central European region and the third in the world in terms of performance similar to the laboratories CSTT's-Climatic Engineering and Testing Division Canada, Climate test chamber - Research Institute of Sweden and ABB High Power Laboratory, Sweden.
- Features: large-scale climatic chamber, of 500 m<sup>3</sup> maximum volume, intended for research and testing under various climatic outdoor conditions with specific parameters to all weather areas on the globe up to those with an excessive climate as - 50 °C or + 80 °C, with equipment to generate ice (Fig. 2), chicory, hail, solar radiation, wind, precipitation, atypical climatic phenomena.
- Advantages.
- The implementation of the research and testing platform for the effect of extreme environmental actions on buildings intended the qualification and climate approval of the vital infrastructure components of human communities (communication routes, energy security, medical units, emergency systems, etc.).

**RO.240.**

- Title EN** **Innovative Research Infrastructure for Dynamic Action Tests of Special Equipment in Aeronautics, Shipping, Telecommunications**
- Authors** Constantin MIRON, Adrian CIOBANU, Aurelia BRADU, Ionel PUSCASU, Monica CHERECHEȘ, Florina FILIP Alina COBZARU
- Institution** **National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development “URBAN-INCERC” Iasi Branch**
- Description EN** The research infrastructure for dynamic action tests aimed to provide modern and complex assessment methods related to structural and functional safety of buildings, support infrastructures for energy sources and security of energy supply (energy insurance) in earthquake conditions.
- Features:  
**Seismic platform and high vibration simulator** (Fig.1, 2)

- static load of at least 1.5 tf;
- 3-way drive (x-y-z);
- peak acceleration 10 g;
- working frequency: 5-100 Hz;

**Hardware system** for control of seismic action simulation equipment;

**Software package** for data control and acquisition;

**Extensometers:** 20 to 150 mm base measurement range.

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**RO.241.**

<b>Title EN</b>	<b>Innovative comprehensive researches on masonry structures for the strengthening and restoration of heritage buildings</b>
<b>Authors</b>	<b>Claudiu-Lucian MATEI</b>
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBANISM AND SUSTAINABLE SPATIAL DEVELOPMENT „URBAN-INCERC” - Bucharest Branch</b>
<b>Description EN</b>	<p>The paper presents the ways to determinate the characteristics of masonry, which was commonly used in old cultural masonry construction in Romania.</p> <p>Given the importance of the building and the fact that it is part of the national cultural heritage, it is necessary to decide the better analyse the resistance characteristics and to evaluate its properties by performing no-destructives tests - F 2a type – test for evaluate the strenght characteristics of masonry structure.</p> <p>The <i>applications advantage</i> of the innovative method is to test the masonry directly under construction.</p> <p><i>For the features determination of the strength and deformability</i> of the masonry, it was develop in-situ test method which allows, to determine with some accuracy the actual compressive strength under the effective gravity load of the structure, in the working section chosen, at the base of the structure.</p> <p>The testing technique is based on the use of two flat jacks / presses connected to a common oil source to apply a pressure field to a volume of masonry comprised between them.</p> <p>The type of flat presses will be chosen according to the structure of the masonry and the efforts expected to be achieved.</p> <p>The flat plate mounting scheme is given in photo 1</p> <p><i>For the features determination of the shear strength of the masonry</i>, an in-situ test method is used - by displacing a ceramic element from the existing masonry into the decide section.</p> <p>The method is destructive, but local effects protect the rest of the</p>

resistance structure, making it easy to repair.

In order to perform the test, it is necessary to extract a brick from the immediate vicinity of the specimen on which the horizontal force is to be applied. In order to ensure horizontal free movement and facilitate tearing in contoured planes, on the mortar sections in the joint, the vertical joints adjacent to the test points were cleaned of the mortar.

*The advantage* of using innovative, semi, and non-destructive methods is obvious, tests have a limited area of action, they are highly accurate, and repairs are very easy to accomplish, without degrading the masonry structure to the patrimony construction.

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**RO.242.**
**Title EN**

**The potential of parametric technologies for the study of urban development in Romania. Case study: Sulina, Ro**

**Authors**

Teodora Ungureanu, Gabriela Voloacă, Vasile Meişă, Mihaela Sandu

**Institution**

**National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC, Bucharest, Romania**

**Description  
EN**

This research proposes the use of parametric technologies for studying the impact of urban regulations on the development of cities in Romania. The proposed methodology consists of multiple study phases that will help create a useful tool for urban planning. The inventory and the delimitation of the studied area, where all the parameters that influence the urban development in the studied city are determined, leads to the analysis and creation of a 3d model that takes into account the parameters that were studied before. The result is a translation into the digital medium of the combinations between urban form and all the urban regulations that influence it: city simulations. An important goal for this proposal is the accessibility for the non-specialists. The obtained results should be made public through an open-source platform and presented through different mediums: AR, VR, mobile apps, etc. This helps non-specialists be aware of how future urban changes can affect their city.

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**RO.243.**
**Title EN**

**Research Title - “Methodology for identification and management of ecological corridors for large carnivores in Carpathian Mountains. Pilot area: Piatra Craiului National Park and Bucegi Nature Park”**

NATIONAL

<b>Authors</b>	<b>Antonio Tache, Oana Popescu, Cristina Ivana</b>
<b>Institution</b>	<b>National Institut for Research and Development in Constructions, Urban Planning and Sustainable Development URBAN-INCERC București</b> The economic development in Danube-Carpathian area leads to landscape and habitats fragmentation and land use change and creates barriers for wild species movements. The poster is based on partial results of the project " <i>Restoring and managing ecological corridors in mountains as the green infrastructure in the Danube Basin-ConnectGREEN</i> ", that runs between 2018 and 2021 within the Interreg Danube Transnational Program. Its main objective is to maintain and improve the ecological connectivity between natural habitats (Natura 2000 and other protected areas of transnational relevance) in the Carpathian ecoregion by identification and management of eco-corridors and their connectivity gaps and by reconciliation between nature conservation and spatial planning practices.
<b>Description</b> EN	The proposed project methodology for identifying, evaluating, monitoring and management of connecting elements was applied in order to enable the development of a coherent network of protected areas between Piatra Craiului National Park and Bucegi Natural Park. As GIS habitat suitability models, two ARCGIS tools were used: CorridorDesign and the Least-Cost Paths (Spatial Analyst). Special Protection Areas (SPAs) of the Natura 2000 network were selected as core areas to be connected through ecological corridors in the pilot area. A map of the resistance of the landscape matrix to the mobility of the selected species (bear, wolf and lynx) was created and the CostDistance tool of ArcGIS was used on the maps of core areas and resistances to highlight the ecological corridors. Ecological Corridors are critical for the maintenance of ecological processes allowing the movement of animals and the continuation of viable populations.

**RO.244.****Title EN****Composite thermal insulation composite panels with sheep wool core, production methods and execution****Authors**

Hegyí Andreea-Cristina; Szilágyi Henriette; Dico Carmen-Silvia; Meită Vasile

**Institution****National Institute for Research and Development in**



**Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, Cluj-Napoca Branch**

**Patent**

Patent application No. A 00551/2018

The invention refers to composite thermo-insulating panels with sheep wool core, including production methods and execution.

The innovative nature of this patent application derives from the removal of mattress type products disadvantages, through a principle of embodying the mattress sheep wool core in a composite shell based on inorganic binder. In addition, following the execution process, which provides the arrangement of mineral wool strips between two adjacent panels, the re-use of mineral wool waste - a product that is not biodegradable, with a positive impact on the environment - is achieved.

The purpose of the wool composite thermo-insulating panels is to increase the thermal insulation and thermal comfort properties in buildings, enclosed spaces for industrial or agro-zootechnical activities.

**Description**

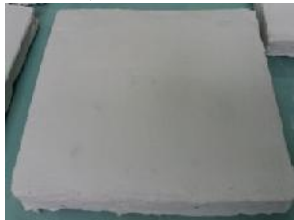
**EN**

Claim no. 1. Composite thermal insulation panels with sheep wool core.

Claim no. 2. Production methods of the composite thermal insulation composite panels.

Claim no. 3 Execution of composite insulating panels with sheep wool core, with insulating material (mineral wool) waste strips insertions, in order to reduce the risk of thermal bridges.

*The research is performed within the scientific research Project: "Research on the capacity to transfer and market research results on the integrated use of natural wool resources. Applicability of eco-innovative sheepwool products in the field of construction", Programme code 5PS/02.11.2017, financially supported by Ministry of Research and Innovation, Romania*



**RO.245.****Title EN****Wall construction system based on unfired clay****Authors**

Călătan Gabriela-Adela, Hegyi Andreea-Cristina, Szilagyi Henriette, Meiță Vasile

**Institution****National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, Cluj-Napoca Branch****Patent**

Patent application No. A 01120/2018

**Description  
EN**

The building system for the walls based on unfired clay is composed of the following elements: bricks, masonry mortar and plaster, respectively finishing tiles, being realized of a mixture of clayey soil, sand and hydrated lime. The purpose of this invention is to provide a complete and environmentally friendly solution for making unfired clay-based walls. The novelty of this invention consists in reducing, until eliminated, the risk of poor jointing between bricks, masonry mortars, plastering or finishing, while also providing the advantage of reducing the environmental impact of pollutants.

The unfired clay wall system is used in order to obtain new types of structures, that have a low impact on the environment.

Claim no. 1. Bricks based on unfired clay 200x100x50 mm.

Claim no. 2. Mortar for masonry and plaster for unfired clay surfaces.

Claim no. 3. Finishing plaster based on unfired clay.

Claim no. 4. Wall construction system based on unfired clay.

7



RO.246.

<b>Title EN</b>	<b>Studies on the development of using fly ash as raw material for obtaining sustainable building materials in the circular economy context -alkali activated materials</b>
<b>Authors</b>	Adrian LĂZĂRESCU, Henriette SZILAGYI, Cornelia BAERĂ, Călin MIRCEA, Andreea HEGYI
<b>Institution</b>	<b>National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, Cluj-Napoca Branch</b>
<b>Description EN</b>	<p>Worldwide, there is an enormous amount of industrial waste ash generated by power plants that have posed the energy industry a great challenge in terms of the disposal, both because environmental and health issues.</p> <p>Geopolymers are the new type of materials that use a different chemistry to the one found in traditional ordinary Portland cement composites.</p> <p>By activating the fly ash, with an alkali-based liquid, this type of material can be created, reducing the CO2 footprint significantly and offering improved mechanical properties.</p> <p>Experimental procedures for obtaining alkali-activated fly ash-based geopolymer paste (FAGP) using Romanian local raw materials were performed in controlled laboratory conditions, in order to collect proper data that would be used for future studies in the topic. Careful investigation of specific ratio variations within the paste when using fly ash from different sources provides important conclusions regarding further approaches of the mix design of the geopolymer material. Optimal dosage of the geopolymeric paste would be used in further geopolymer mortar and concrete design.</p> <p>Preliminary results obtained on alkali-activated fly ash-based geopolymer paste using different Romanian power-plant source materials for producing innovative cementitious compositions based on efficient source materials and by investigating the basic parameters affecting their mechanical properties open new perspectives in the production of this type of material. The ultimate goal is to bring the geopolymer concrete at a level where it can be tested in real life applications where industry should be able to use optimized mixtures in possible structural applications, with provided recommendations.</p> <p><i>The research is performed within the scientific research</i></p>

*Project - PN 18 35 04 03: "Research for valorising the inert, hydraulic, late or pozzolanic mineral additions in innovative cementitious materials for resilient structures, in the context of implementing the "Circular Economy" concepts in Romania.*

**Class no.**

7

**RO.247.**

**Title EN**

**Evaluation of the engineered cementitious composites in infrastructure with different components**

**Authors**

Anamaria Cătălina MIRCEA, Henriette SZILAGYI, Cornelia BAERĂ, Călin MIRCEA, Andreea HEGYI

**Institution**

**National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, Cluj-Napoca Branch**

The study focuses on the development of the Engineered Cementitious Composites using Romanian local materials. Developed by Li and his co-workers in the 1990s, Engineered Cementitious Composites, are a special type of High Performance Fiber Reinforced Cementitious Composites (HPFRCC). These special materials can meet the stringent requirements of resiliency and durability in infrastructures. They have been successfully applied in bridge deck overlays, bridge deck link slab, dam repairs, beams in high rise buildings and so on. The use of local materials is preferred for economic reasons and to enhance infrastructure sustainability. The material consists of controlled quantities and types of cement, fly ash, sand, additives, water and fibers. Using Type 1 of fibers at a 2% of the volume, ECCs with excellent tensile strain hardening behaviour with local materials can be developed with achieving a compressive strength of 60-80MPa and a tensile strength of 25MPa. To increase the tensile strain capacity of ECCs and to reduce matrix toughness, crumb rubber was introduced in the mixture of ECCs. Using crumb rubber in the mixture, the compressive strength obtained was 20-25MPa, while using silica sand was almost 4 times bigger. The compressive strength decrease gradually with the increase of the crumb rubber. A possible reason is the increase in matrix porosity or the fact that crumb rubber has lower strength and poor bond with the hydration products compared to the silica sand. Due to the obtained results, the Engineered Cementitious Composites using local materials, are more recommended for using them as infrastructure.

**Description  
EN**

*The research is performed within the scientific research Project*

NATIONAL

- PN 18 35 04 03: *“Research for valorising the inert, hydraulic, late or pozzolanic mineral additions in innovative cementitious materials for resilient structures, in the context of implementing the “Circular Economy” concepts in Romania.*

**RO.248.**

**Title EN**

**The social impact of the Romanian research-development activity financing**

**Authors**

Mircea-Iosif Rus

**Institution**

**National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, Cluj-Napoca Branch**

The research-development activity may be considered as the motor of an economy. The achievements of this activity are found under the shape of products or goods which enter in the economic circuit. To arrive at those new goods or products two things are needed: financial resources and human resources.

Financial resources may be allocated both from public and private sources. Until the year 2020, Romania should allocate 1% of the GDP from public sources and 1% of the GDP from private sources for the research-development activity. For the time being, from the two sources together almost 1% is allocated.

**Description  
EN**

The human resource is the most important in this activity. If such resource would not exist, the financing values of this activity could not be spent.

We need to specify that the employees structure includes researchers, engineers of technological development, technicians, chief operators, etc. it may be easily noticed that, except for the year 2014, when a decrease of the number of employees was registered, the number of employees involved in this activity increased constantly, a fact which is hopeful as it shows an increase consistent with the values allocated for this activity and with the number of projects which increased too.

The constant increase of the number of researchers leads us to the idea that more and more young people start to be connected to this activity. The number of researchers of this field increased which means that funds were accessed for this activity from outside the country.

**RO.249.**

- Title EN** **Durability studies on self-compacting concrete**
- Authors** Henriette SZILAGYI, Marius CÎMPAN, Adrian LĂZĂRESCU, Zoltan KISS
- Institution** **National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, Cluj-Napoca Branch**  
Permeability properties, including permeability, absorption, diffusivity, etc., have been widely used to quantify the durability characteristics of concrete in general. Nowadays, the performance required for the concrete structure is more complex than ever. Concrete must have high fluidity, high strength and a durable structure design. Self-compacting concrete could meet these requirements; extended studies has been done on the permeability properties of self-compacting concrete mixtures (SCC) compared to traditional concrete (vibrated concrete) with the same strenght class.
- Description EN**

**RO.250.**

- Title EN** **CONTRIBUTIONS ON THE FIRE PERFORMANCE ASSESSMENT OF ETICS SYSTEMS**
- Authors** Adrian Simion, Ion Anghel, Horatiu Gabriel Dragne, Daniela Stoica
- Institution** **NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBANISM AND SUSTAINABLE SPATIAL DEVELOPMENT „URBAN-INCERC” – INCERC Bucharest Branch**  
The Romanian norms and technical regulations do not provide the obligation of compartment fire tests for composite facade insulation systems "ETICS". Unfortunately, only after these tests can result reliable data on the performance evaluation of ETICS systems under the effects of compartment fires, and there is still no harmonized European standard requiring such tests (in 2018 the first part of a European project that aims to harmonize the fire exposure test of façades was completed). In this context,
- Description EN**

researchers from the INCERC Fire Security Research and Testing Laboratory in Bucharest, tested experimentally the exposure to compartment fire of two types of ETICS systems, according to the test method set out in BS 8414. The climate test conditions of both systems were similar, and after the tests (for the first time in Romania) a series of data were obtained on the behavior of ETICS systems under the action of compartment fires. With these results, the Romanian fire research aims to bring its contribution at European level, for the large-scale fire performance assessment of ETICS systems and the identification of innovative solutions for limiting fire propagation on building facades.

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**RO.251.**
**Title EN**

**An educational concept for earthquake awareness and prevention in Romania: understanding seismic failures by using data from the URBAN-INCERC digital archive**

**Authors**

Emil-Sever Georgescu, Iolanda-Gabriela Craifaleanu, Claudiu-Sorin Dragomir, Daniela Dobre

**Institution**

**National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development, “URBAN-INCERC”, Romania**

**Description EN**

Romania was struck during its history by several catastrophic earthquakes. The most recent of these, occurring on March 4, 1977, killed over 1500 people, caused the damage or collapse of almost 33000 buildings and deeply traumatized the population. However, today, after more than four decades, a large proportion of the country’s population has never witnessed a destructive earthquake and most of it is completely unaware of the reasons of seismic failures of buildings. Even though preparedness activities are carried out on a legal basis in schools, universities and organizations, these do not include information about potential damage or failure that can occur in the building hosting these activities or in others. A wealth of information on the experience of the March 4, 1977, earthquake is available at the National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development, “URBAN-INCERC”: post-seismic damage reports and a picture collection showing various types of damage caused by the earthquake. This valuable resource, corroborated with

the know-how of the institute's specialists, that are able to provide the necessary scientific, technical and historical background information, forms a critical mass that, by its dissemination, would make a significant contribution to the education of the large public, as well as of professionals, for understanding the weak points of seismic conception, design, detailing and construction. Structured, in the future, as an innovative digital platform, the resource could target a multiple audience: citizens, educators, engineers, architects, contractors, decision-makers.

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**RO.252.**

<b>Title EN</b>	<b>Innovative comprehensive researches on masonry structures for the strengthening and restoration of heritage buildings</b>
<b>Authors</b>	<b>Claudiu-Lucian MATEI</b>
<b>Institution</b>	<b>NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBANISM AND SUSTAINABLE SPATIAL DEVELOPMENT „URBAN-INCERC” – INCERC Bucharest Branch</b>
<b>Description EN</b>	<p>The paper presents the ways to determinate the characteristics of masonry, which was commonly used in old cultural masonry's construction in Romania.</p> <p>Given the importance of the building and the fact that it is part of the national cultural heritage, it is necessarily to decide the better analyses the resistance characteristics and to evaluate its properties by performing no-destructives tests - F 2a type – test for evaluate the strenght characteristics of masonry structure.</p> <p>The <i>applications advantage</i> of the innovative method is to test the masonry directly under construction.</p> <p><i>For the features determination of the strength and deformability</i> of the masonry, it was develop in-situ test method which allows, to determine with some accuracy the actual compressive strength under the effective gravity load of the structure, in the working section chosen, at the base of the structure.</p> <p>The testing technique is based on the use of two flat jacks / presses connected to a common oil source to apply a pressure field to a volume of masonry comprised between them.</p> <p>The type of flat presses will be chosen according to the structure of the masonry and the efforts expected to be</p>



achieved.

The flat plate mounting scheme is given in photo 1

*For the features determination of the shear strength of the masonry*, an in-situ test method is used - by displacing a ceramic element from the existing masonry into the decide section.

The method is destructive, but local effects protect the rest of the resistance structure, making it easy to repair.

In order to perform the test, it is necessary to extract a brick from the immediate vicinity of the specimen on which the horizontal force is to be applied. In order to ensure horizontal free movement and facilitate tearing in contoured planes, on the mortar sections in the joint, the vertical joints adjacent to the test points were cleaned of the mortar.

*The advantage* of using innovative, semi, and non-destructive methods is obvious, tests have a limited area of action, they are highly accurate, and repairs are very easy to accomplish, without degrading the masonry structure to the patrimony construction.

**Class no.**

**RO.253.**

**Title EN**

**Scalable Indoor Pollutants (SIP) monitoring system**

**Authors**

Cristian PETCU<sup>1</sup>, Vasilica VASILE<sup>1,2</sup>, Vlad IORDACHE<sup>2</sup>, Mihai TODERAȘC<sup>1,2</sup>

**Institution**

<sup>1</sup> National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, INCERC Bucharest Branch

<sup>2</sup> Technical University of Civil Engineering, Faculty of Building Services

**Description EN**

The persons living in urban areas spend approximately 90 percent of their time indoors (*U.S. Environmental Protection Agency, EPA/400/1-89/001C*), where on average they are exposed to 2 ÷ 5 times higher concentrations than in a typical outdoor climate (*EPA/600/6-87/002a*). Our experimental researches, based on monitoring residential, offices and education spaces, confirms these data applies also for Romanian indoor quality.

*Applications.* In order to prevent the prolonged exposure to an indoor climate which could affect the comfort, work efficiency and potential affect the health, the Scalable Indoor Pollutants (SIP) monitoring system was designed. SIP design consists in

tree layers of technology: (1) *independent units* with transducers and a local calculation unit, in order to sample and measure the pollutant concentration in indoor air, (2) transmission protocol towards a *central unit* capable to log the provided information, (3) central *database with dedicated software*, capable to process data, analyze information and send personalized, tailored recommendations for **SIP** users, regarding air quality and energy performance of indoor environment.

*Advantages.* The system is designed focusing on available technologies and open source software, capable to assure a level of transparency on measured / logged information compatible with GDPR EU regulation, high replicability and further integration with mobile devices or IoT devices. *The innovative unique integration* of mass-produced micro components allows affordable costs, thus increasing the potential for adoption.

**SIP** preconized impact is primary a raise in the population awareness regarding indoor air quality and energy efficiency, leading towards a better, safer indoor air quality.

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**RO.254.**

**Title EN** **Costs of recovering waste recyclable in construction by using sustainable ecological materials**

**Authors** Silviu LAMBRACHE

**Institution** **NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBANISM AND SUSTAINABLE SPATIAL DEVELOPMENT URBAN-INCERC**

Research for the cost of using recyclable ecological materials in buildings, which comprise recyclable waste of agricultural / animal and industrial nature are in early stages and consists of research for probable costs of achievement and implicitly for the economic efficiency obtained through their implementation.

**Description EN** At present, green materials accessible to the national construction sector are imported, which leads to additional purchase costs, as they do not always present an optimal ratio for the results / benefits ratio obtained in relation to the costs involved. Also, the use of eco-materials from the import does not ensure the recycling of recyclable waste in our country with negative effects on the environment.

Research done so far at national level for the possibility of using agricultural waste in biocomposite structures has led to cost-effective comparative results. In order to build masonry, it's possible to use as a substitute bricks that contain in their

composition industrial wastes such as sludge from the waste water treatment plants or fly ash bricks. The use of environmentally friendly bricks leads to the lowest cost compared to commonly used materials, thus ensuring not only high cost-friendliness and also ecological benefits through preserving the environment.

Based on the research results, it's recommended to ensure a production at national level for green construction products and materials that contain natural recyclable waste, which will not only lead to increased financial accessibility but also the reducing of the waste volume with potential for use in the field of construction.

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**RO.255.**

**Title EN**            **Microspheres, perlite and kaolin, a synergic interaction for an innovative coating**

**Authors**            Irina Popa, Cristian Petcu, Mihai Toderașc, Alexandrina Mureșanu

**Institution**        **NIRD "URBAN-INCERC", INCERC Bucharest Branch**

**Description**  
**EN**

The project studied several aspects related to the synergic interaction between three kinds of materials mixed in order to obtain an innovative coating characterized by thermal isolating properties. Starting from the point that each of these materials has a certain potential in this respect, in the experimental work, besides water there were used: an acrylic product in aqueous dispersion with ceramic microspheres (component I), perlite granules (component II) and a kaolin powder (component III). The research studied the influence of the perlite content on the thickness, adherence and thermal conductivity of the new product made with the three main materials and applied in three-layered coatings. The experimental results were also analyzed by means of the structural interaction of the components I, II and III, taking into account the I:II ratio. It was also outlined the fact that the essence of the synergy stays in assessing the differences in the structural features of the three components, and thus, depending on the mentioned ratio, the advantage to obtain this innovative product, applicable on plastered surfaces and on plasterboard. The new coating is recommended for its ecological features, a thermal insulating performance better than that of the component I, even if the latter is recognized as an efficient and relatively expensive thermal isolating new-generation product.

## Military Equipment and Technologies Research Agency

**RO.256.**

**Title EN**

**UAV SYSTEM FOR SURVEILLANCE ULTRA – 20  
MULTIROL**

**Authors**

Alexei Adrian, Drăguș Liviu, Țigleanu Laura, Dumitru  
Marin, Gherghina Ion, Năciou Nicolae

**Institution**

Military Equipment and Technologies Research Agency

The system is intended/ designed for:

- training through real shooting , with various types of weapons, in simulating threats conditions of unmanned aerial platforms, cruise missiles or low speed piloted aircraft;
- real-time tactical field video surveillance.

**Sistem structure:**

- ULTRA-20 V1 aerial platform;
- Ground Control Station – GCS;
- Ground Data Terminal – GDT;
- Launching ramp.

**Description  
EN**

**Physical characteristics:**

- wing span: 3255 mm;
- length: 2555 mm;
- structure weight: 11.5 Kg;
- MTOW : 25 Kg

**Piloting features:**

- autonomous flight on scheduled paths;
- up to 200 waypoint for mission programming;

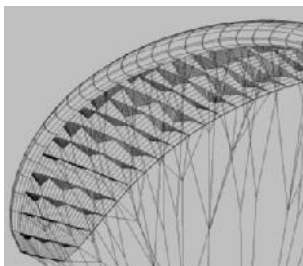
in case of radio link interruption, the aerial platform automatically returns to the starting/launching point.

**Class no.**

**National R&D Institute for Textiles and Leather  
INCDTP Bucuresti**

**RO.257.**

**Title EN** **Single Sail Flexible Textile Wing**  
**Authors** Salistean Adrian, Toma Doina, Badea Ionela  
**Institution** **The National R&D Institute for Textiles and Leather - INCDTP Bucuresti**  
**Patent** Patent application No. A/01034/2018  
**Description EN** The invention relates to a flexible inflatable textile wing composed of a single sail on the extrados and equipped with composite reinforcements on the leading edge of the wing. The wing profile is the main determinant of flight performance. On regular paragliders it must have a shape that exhibits increased stability of the staging point on the leading edge. This point must not come out of the area where the air intake is positioned in the cells, because if it leaves this area, the cell does not receive any air and cannot keep the inflatable wing properly. The present invention addresses this aspect by removing the underside of the inflatable wing cells and reinforcing the leading edge of these cells with semi-rigid reinforcing rods.  
**Class** Applications: Paraglider and Ram-air parachute design and manufacture, Sport or Military parachuting hardware.  
 8

**RO.258.**

**Title EN** **Ultrasound welding equipment**  
**Authors** Ene Alexandra Gabriela, Mihai Carmen, Jipa Cristian  
**Institution** **The National R&D Institute for Textiles and Leather - INCDTP Bucuresti**  
**Patent** Patent application No. A/00630/03.09.2015  
**Description**

**EN** The present invention relates to an ultrasonic welding device consisting of: a base frame made of aluminum profiles cut at an angle of 45 degrees demountable jointed through corners; module of slide and drive of the specimen comprised of a fixing bracket and a supporting frame; the horizontal positioning module of the ultrasound welding element made up from two guiding axes having round profile supported by means of two profiled supports on which are placed two linear-type slide bearings with open-type recirculating balls, with pre-tensioning, rigidly mounted on an aluminum plate; the vertical positioning module of the ultrasound welding element made up from two guiding axes vertically positioned having round profile supported by means of two profiled supports on which are placed two linear-type slide bearings with open-type recirculating balls, with pre-tensioning, rigidly mounted on an aluminum plate; fastening bracket of the ultrasound welding element provided with spring systems; three power-up modules and an electrical installation consisting of a power supply block and a control and positioning block of the drive elements.

**Class**

9



**RO.259.**

**Title EN** **Microcapsules from collagen hydrolysate with essential oils and process of obtaining thereof**

**Authors** Albu Madalina Georgiana, Kaya Durmus Alpaslan, Ramazan Mahanoglu, Albu Florica Luminita, Coara Gheorghe, Bumbenechi Georgeta

**Institution** **The National R&D Institute for Textiles and Leather - INCDTP Bucuresti, Division: Leather and Footwear Research Institute**

**Patent** Patent application No. A/00730/30.09.2014

**Description EN** The invention refers to microcapsules from collagen hydrolysate with essential oils, used in the cosmetic and

medical fields and to a process of obtaining thereof.

The microcapsules obtained in this invention are spherical natural systems based on collagen hydrolysate and essential oils, of micrometer size, with antimicrobial properties and can be used in the functionalization of textile structures for making anti-cellulite stockings and socks for diabetic foot with purpose of treatment/ prevention.

Application of the invention has the advantage that the microcapsules are natural, antimicrobial, having in composition mainly protein (collagen) and plant extracts (essential oils), have the ability to functionalise inert materials (textiles, plastics, metals) and may be the active ingredient in cosmetics, pharmaceuticals, food, medicine and agriculture.

Class

4



**RO.260.**

**Title EN**

**Collagen hydrogels with encapsulated nutrients**

**Authors**

Zainescu Gabriel, Albu Luminita, Constantinescu Rodica Roxana

**Institution**

**The National R&D Institute for Textiles and Leather - INCDTP Bucuresti, Division: Leather and Footwear Research Institute**

**Patent**

Patent application No. A/00966/06.12.2016

**Description EN**

The invention refers to a process of obtaining collagen gels with encapsulated nutrients, used as fertilizers in agriculture. This paper presents an innovative process for the biochemical degradation of pelt waste in order to obtain encapsulated protein biocomposites to be used as fertilizers for poor soils and for plant growth. The proposed method consists in the treatment of raw hide waste by direct hydrolysis of protein waste in an acidic environment, in combination with other polymers (polyacrylamide, starch, urea, acrylic, maleic,

cellulose etc.), thus obtaining hydrogels with collagen structure. For this purpose natural sources of protein are enriched by the addition of macro- and/or micronutrients (phosphorus and potassium), resulting in compounded complex systems, namely protein hydrogels. Following experiments it can be concluded that direct hydrolysis of a protein source in the presence of natural or synthetic polymers results in hydrogels with collagen structure to improve soil quality and horticulture.

**Advantages**

Therefore, the tannery protein wastes are required to be subjected to biochemical treatments with the view of recycling in the agriculture.

- an increase in the aggregation of soil structural elements in weathered soils;
- prevention of crust formation in the period between sowing and spring, especially for plants with small seeds, which are very vulnerable;
- an increase in resistance to water and wind erosion of soils located on slopes and coarse grained soils.

The degree of **novelty** is based first of all on the fact that the promoted technologies have as a starting point obtaining of new complex products by processing organic wastes which can be applied in agriculture.

**Class**

3





**National Institute Of Research-Development For Machines  
And Installations Designed To Agriculture And Food  
Industry – INMA Bucharest**

**RO.261.**

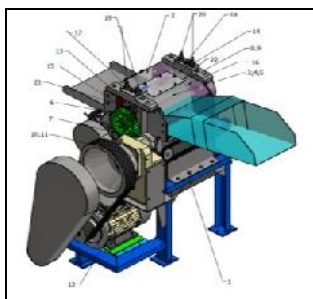
**Title EN** **DEVICE FOR BED IRRIGATION WITH CONTINUOUS JET FLOW**  
**Authors** **Manea D., Marin E.,** Koloszvari C., Tănase B.  
**Institution** **INMA Bucharest**  
**Patent** **Patent RO 127709 / 2018**  
**Description EN** The invention relates to a device for bed irrigation with continuous jet flow, mounted on the sprinkler ramp of an irrigation plant employed in wetting leguminous and hoeing plants crops on medium and large surfaces.  
**Class** 3

**RO.262.**

**Title EN** **MIXED SYSTEM AND METHOD OF SEPARATION OF QUARANTINE WEED SEEDS FROM GRAINS**  
**Authors** **Vişan Alexandra**  
**Institution** **INMA Bucharest**  
**Patent** **Patent application No. A 01112 / 2017;  
EPO 18020423.2 /2018**  
**Description EN** The invention relates to a mixed system and method of separation of quarantine weed seeds from grains, which is operated with fluid artificial fillets is intended for grain post-processing equipment, to provide superior quality  
**Class** 3

**RO.263.**

**Title EN** **SORGHUM STEM PRESS**  
**Authors** **Vlăduţ V., Păun A.,** Găgeanu I., Găgeanu P., Voicea I., Apostol L., Matei G.  
**Institution** **INMA Bucharest**  
**Patent** **Patent Applications No. A – 01051 / 2018**  
**Description EN** The invention relates to an installation for processing sorghum stems intended for producing juice for bioethanol production.  
**Class** 3



**RO.264.**

**Title EN** **METHOD OF MONITORING VEGETATION STATUS OF CROPS THROUGH THE MEANS OF A AGRICULTURAL DRONE**

**Authors** **Cujbescu D., Voicea I., Persu I., Găgeanu I., Matache M., Gheorghe G.**

**Institution** **INMA Bucharest**

**Patent** **Patent Applications No. A – 00670 / 2018**

**Description EN** The invention refers to a method of determining the vegetation status of agricultural crops through the means of a agricultural drone in order to assess the vegetation status of the monitored crops in the infrared spectrum in order to highlight early the changes in the state of plant health, before they become apparent in the visible spectrum.

**Class** **3**

**RO.265.**

**Title EN** **PEAT BASED GRANULAR ECOLOGICAL BIOCOMPOSITE FERTILIZER AND ITS PRODUCTION PROCESS**

**Authors** **Coța C., Nagy E., Cioica N., Gyorgy Z., Pop A., Drăgan S., Miclăuș V., Miclăuș A.**

**Institution** **INMA Bucharest**

**Patent** **Patent Applications No. A – 00775 / 2018**

**Description EN** The invention relates to a granular biocomposite based on humic and fulvic acids, vitamins, phytohormones and plant growth regulators, derived from peat with addition of inorganic fertilizers (urea and ammonium phosphates) and chemical synthesis compounds assimilated to the vitamin B group (paraaminobenzoic and ortic acid) designed for

EUROINVENT 2019

fertilization with ecological granular fertilizers. The invention relates to the production process

**Class** 3

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**RO.266.**

**Title EN** **INCUBATION INSTALLATION FOR THE REPRODUCTION OFF-SEASON AS WELL OF STURGEONS BRED IN RECIRCULATED WATER SYSTEMS**

**Authors** Pop A., Grozea A., Bäumchen A., Laza E.

**Institution** INMA Bucharest

**Patent** Patent Applications No. A – 00319 / 2017

**Description EN** The invention relates to an incubation installation of recirculating acvacole system (SAR) type for the reproduction off-season as well of sturgeons bred in recirculated water systems which is intended to provide sturgeon juvenile fish throughout the year.

**Class** 3

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**RO.267.**

**Title EN** **UNIVERSAL MACHINE FOR REED HARVESTING**

**Authors** Ganea-Christu Ioan, Ciupercă Radu, BRĂCĂCESCU Carmen, ZAICA Ana

**Institution** INMA Bucharest

**Patent** Patent application No. A00517 / 2017

**Description EN** The invention relates to a universal machine for reed harvesting which moves on wheels in dry or marshy ground conditions, but especially in deep water conditions and is intended for harvesting reed in the form of sheaves and storing them on the machine.

**Class** 3



NATIONAL

**RO.268.**

**Title EN**

**INTELLIGENT SYSTEM FOR VARIABLE ZONAL IRRIGATION**

**Authors**

**Muraru V., Muraru S.,** Condruz P., Muraru C.,  
Țicu T., Deak G., Laslo L., Matei M., Boboc M., Stan A.

**Institution**

**INMA Bucharest**

**Patent**

**Patent Applications No. A – 00632 / 2018**

**Description EN**

The invention refers to an intelligent irrigation system that can be adapted to the classic watering systems by sprinkling or by dripping, designed for variable zonal irrigation of agricultural lands, depending on the soil moisture, determined based on satellite information and the water needs of crop development.

**Class**

3

**RO.269.**

**Title EN**

**PLATFORM WITH MOVABLE ELEMENTS FOR TRAILERS**

**Authors**

**Popa L., Nedelcu A., Ștefan V., Cristescu A.**

**Institution**

**INMA Bucharest**

**Patent**

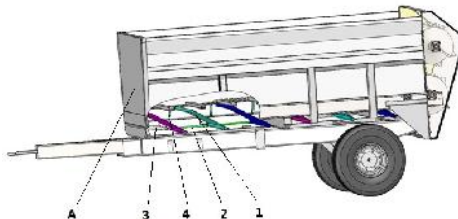
**Patent Applications No. A – 00824 / 2018**

**Description EN**

The invention relates to a platform with articulated mobile elements for trailers body, for improving the process of unloading the material, in case of damage.

**Class**

3



**RO.270.**

**Title EN** **ECOLOGICAL EQUIPMENT FOR THERMAL WEED DESTRUCTION IN VEGETABLE GROWING**

**Authors** **Muscalu A., Persu C., Ganea-Christu I., Bolintineanu G., Tudora C.**

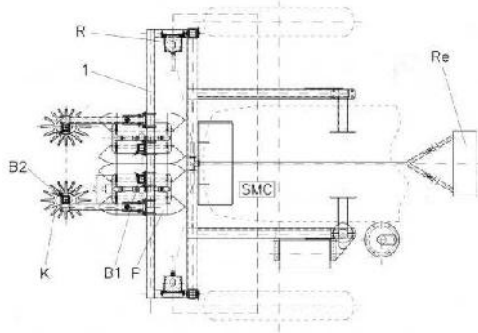
**Institution** **INMA Bucharest**

**Patent** **Patent Applications No. A – 00020 / 2019**

**Description EN** The invention relates to combined equipment for the thermal destruction of weeds in vegetable growing using hot water sprayed by a system with successive nozzles and mechanical using Kress digging parts.

**Class**

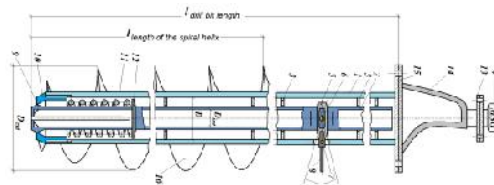
3



**National Institute for Research and Development in  
Forestry “Marin Drăcea”**

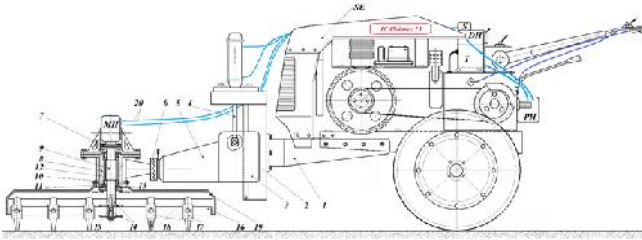
**RO.271.****Title EN****DRILL FOR DIGGING HOLES, WITH INTERIOR MECHANISM****Authors****Cătălin TUDOSOIU****Institution****INCDS „Marin Drăcea”****Patent****Patent application No. A 00606 / 2016****Description****EN**

The invention relates to a drill for digging holes, with interior mechanism, intended as a active body of work for machines and earth borer, operated by an independent energy source type tires tractor, tracked tractor, and others, that can execute digging of the pit phase and the placement of workloads at the lower end of the pit phase.

**Class****3****RO.272.****Title EN****EQUIPMENT FOR NATURAL REGENERATION ASSISTANCE WORKS, SPECIFIC TO CVERCINEE STANDS****Authors****Cătălin TUDOSOIU****Institution****INCDS „Marin Drăcea”****Patent****Patent application No. A 00216 / 2018;****EPO 19020131.9.codes 001,002 / 2019****Description****EN**

The invention relates to equipment intended for the natural regeneration assistance works in the case of cvernicnee stands, the purpose of which is superficial mobilization and soil homogenization (for a depth of 3-5-8 cm), while removing the litter, in order to ensure optimum conditions for the germination of seeds (acorns), with the subsequent development of the seedlings throughout the year so as to ensure their optimum development conditions, with the subsequent formation of a new stand.

**Class****3**

**RO.273.****Title EN**

**DEVICE FOR PRICKING OUT RESINOUS SEEDLINGS AND SEEDLINGS INTENDED FOR AGRICULTURAL CULTURES**

**Authors**

**Cătălin TUDOSOIU, GANEA-CHRISTU Ioan**

**Institution**

**INCDS „Marin Drăcea”**

**Patent**

**Utility Model Application No. U-00026 / 2018**

**Description EN**

The utility model refers to a universal device for pricking out (planting) resinous seedlings and seedlings intended for agricultural crops, grown in nutrient beds or in solariums, by the germination of resinous seeds and the growth of seedlings, respectively seeds of agricultural plants such as tomato, eggplant, tobacco, cabbage seedlings, etc., in order to transplant them into the open field and to develop intensive crops.

**Class**

**3**

**RO.274.****Title EN**

**CARRIED MACHINE FOR DEEP HOLE DRILLING TO PLANT POPLAR SEEDLINGS**

**Authors**

**Cătălin TUDOSOIU**

**Institution**

**INCDS „Marin Drăcea”**

**Patent**

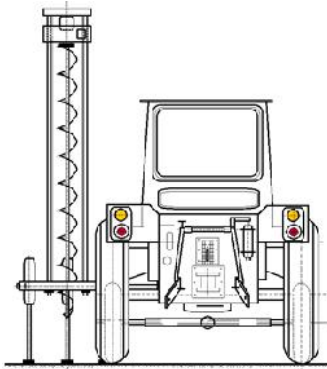
**Patent Applications No. A - 00245 / 2017**

**Description EN**

The machine is designed for the installation of poplar long cuttings, with their introduction to the depths as close to the groundwater level as possible, so as to ensure optimal viability conditions, accumulation of biomass and increased percentages of success after setting up the plantations.

**Class**

**3**



**RO.275.**

**Title EN**

**EQUIPMENT FOR TAKING OUT SHRUBS AND ORNAMENTAL PLANTS WITH BALE OF SOIL, OPERATED BY THE MOTOCULTOR**

**Authors**

**Cătălin TUDOSOIU**

**Institution**

**INCDS „Marin Drăcea”**

**Patent**

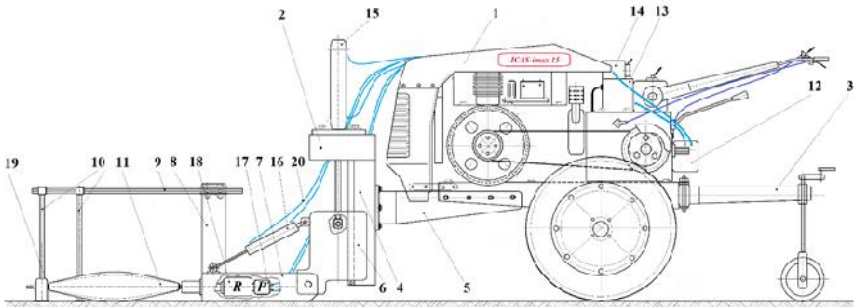
**Patent Applications No. CERTIFICAT U-0017 / 2017**

**Description EN**

The utility model refers to the equipment for taking out shrubs and ornamental plants with a bale of ground, operated by the motocross for the extraction of shrubs, medium-sized fruit trees, ornamental plants, seedlings of rooted vines, with The root protected by a semispheric bale of soil, operated by an average cylinder capacity, for the purpose of transplantation throughout the year, especially during the vegetation season, with the assurance of optimal viability conditions and reduction/avoidance of transplant shock.

**Class**

**3**





RO.276.

Title EN

**COMBINE PLOW FOR DIGGING, RESTORING AND CLEANING DICHES**

Authors

**Cătălin TUDOSOIU**

Institution

**INCDS „Marin Drăcea”**

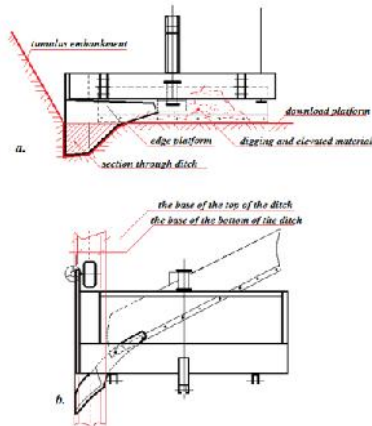
Patent

**Patent Applications No. A - 00413 / 2016**Description  
EN

The invention relates to an equipment for road construction, trailed, type agricultural plow, for digging, cleaning and restoring near by ditches, adjacent platform of forestry roads whose road system is composed of layers of stone, in order to ensure the evacuation of rainwater accumulated on the road footprint. In some cases, combine plow for digging and cleaning ditches can also be used to make ditches required for disposition of facilities such as pipelines and pipes, electrical cables, as well as the execution of open drains.

Class

3



## National Research and Development Institute for Optoelectronics – INOE 2000

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**RO.277.**

<b>Title EN</b>	Azo derivative with ultra-fast SHG response and process for preparing it in ordered crystalline state
<b>Authors</b>	Vasiliu Ileana Cristina, Emandi Ana, Ioniță Iulian Matei Andreea
<b>Institution</b>	National Research and Development Institute for Optoelectronics – INOE 2000 National Institute for Laser, Plasma & Radiation Physics - INFLPR
<b>Patent</b>	No. A/00572/ 11.08.2016 The invention relates to a process for preparing an azo derivative with ultra-fast optical response. According to the invention, the process consists in preparing saturated solutions of organic compound 1-phenyl-3-methyl-azo-(1'-carboxy phenylen)-5-one which are subjected to ultrasonication for different periods of time and at different frequency of 24...27 Hz, after which the crystals of the resulting precipitate are subjected to laser irradiation at a constant intensity of the absorbed laser radiation of 200 mW, until reaching a constant SHG saturation signal corresponding to the maximum molecular crystalline order. Applications: The material can be integrated in high speed optical switching devices for the next generation of all-optical communications systems.
<b>Description EN</b>	
<b>Class</b>	9

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**RO.278.**

<b>Title EN</b>	<b>Alumino-phosphate glasses containing rare-earth ions used as optical sensors and the process for their production</b>
<b>Authors</b>	Mihail Elișa, Bogdan Alexandru Sava Lucica Boroica, Raluca Iordanescu, Ionut Feraru, Mihai Eftimie, Anca Beldiceanu
<b>Institution</b>	National Institute of Research & Development for Optoelectronics-INOE 2000
<b>Patent</b>	Patent application a2014 00251, Patent decision No. 3/24, dated 28.02.2019
<b>Description EN</b>	The invention relates to alumino-phosphate-type glasses products containing rare-earth ions used as optical sensors

and to the process for obtaining them. In order to prepare these glasses, raw materials such as acids, oxides and salts have been used. The raw materials introduce phosphorus oxide as a network glass former and as network modifiers, lithium, aluminium, barium and lanthanum oxides, along with rare-earth oxides as dopants. The raw materials are dosed according to the predetermined formulations, adding an additional amount of lithium oxide and phosphorus oxide precursors taking into consideration their volatility to approximately 15% and 25%, respectively. The preparation wet process of aluminophosphate glasses is based on the chemical reactions between the solid reagents and the phosphorus acid solution. The wet process of doped aluminophosphate glasses provides the advantage of a better homogenization of the raw materials from the first stages of the processing and also allows initiation of the formation of intermediate chemical compounds, precursors of the final chemical compounds in the vitreous structure. This process assures a high chemical homogeneity of the initial batch glass, which precedes the high optical homogeneity of the doped aluminophosphate glasses finally obtained. The batch of raw materials is hot-evaporated by continuous solution homogenization, heat-treated to dry and preheat the mixture of raw materials, then heat treated to the melting and firing temperature for glass preparation and degassing. The molten glass is poured into preheated molds, it is annealed, and then the glass is optically processed for physico-chemical characterization and use as an active element in optical sensing.

Class

14

**RO.279.**

<b>Title EN</b>	<b>Photovoltaic cell based on barium stearate and magnesium phthalocyanines</b>
<b>Authors</b>	H.C. Gandescu, L. Baschir, D. Savastru
<b>Institution</b>	<b>National Institute of Research and Development for Optoelectronics INOE 2000</b>
<b>Patent</b>	Patent application No. A/101064/ 2017
<b>Description EN</b>	The invention relates to a photovoltaic cell with a glass structure / ITO / PEDOT: PSS / P3HT: PCBM + Ba stearate + Mg / Al phthalocyanine, which performs superior to classical photovoltaic cells (glass / ITO / PEDOT: P3HT:

NATIONAL

PCBM / Al). The photovoltaic cell based on barium stearate and Mg phthalocyanine consists of: a glass support, an ITO layer to which an anode terminal is connected, a polymer layer PEDOT: PSS, an active layer composed of P3HT: PCBM and a mixture of Ba stearate and Mg (MgPc) phthalocyanine and a layer of Al to which a cathode terminal is connected.

Applications: Conversion of sunlight directly to electricity-stand-alone systems; electricity for remote areas; disaster relief; scientific experiments; signal systems powering; consumer products; public utilities.

**Class** 2. Energy and sustainable development

**RO.280.**

**Title EN**

**Optoelectronic interferometric device in twin-LPG passive optical fiber for detection of Escherichia coli and Klebsiella pneumoniae bacteria in the running water network**

**Authors**

Micloș Sorin, Lăncrănjan Ion Ioan Ferdinand, Savastru Dan, Savastru Roxana, Tăutan Marina

**Institution**

**National Institute of R&D for Optoelectronics – INOE 2000**

**Patent**

Patent application No. A00689/2018

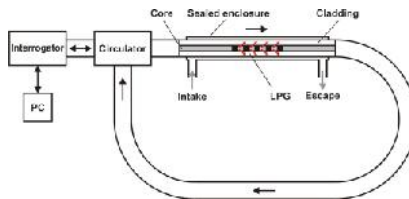
**Description EN**

The invention relates to an interferometric optoelectronic sensor using Twin-LPG passive optical fiber to detect pathogenic strains of Escherichia coli bacteria and / or bacterial species of Klebsiella pneumoniae in the running water network and to measure their concentration by measuring the optical power variations of the incident beam on the photodetector, variations produced by the spectral displacements of the hyperfine structures of the interference fringes generated by the modification of the water refraction index under the effect of infestation with pathogenic strains of Escherichia coli and / or Klebsiella pneumoniae bacteria.

Allows manufacturing of small scale devices to detect Escherichia coli and / or Klebsiella pneumoniae pathogenic strains in the running water network and determine their concentration at low costs and it is compatible with the production of automated flow control systems coupled to the running water network to prevent the infestation of the drinking water network by pathogenic strains of Escherichia coli and / or Klebsiella pneumoniae.

Class

4 (also 1 and 5)

**RO.281.****Title EN****Low altitude radar investigation system with applications in built cultural heritage and archeology****Authors**

CHELMUȘ Iulian Alexandru, RĂDVAN Roxana, ANGHELUȚĂ Laurențiu Marian

**Institution****National Institute for Research and Development in Optoelectronics – INOE 2000****Patent**

Patent application No. A/00222 12.04.2017

**Description EN**

The invention presents an aerial radar system for investigating large archaeological sites, historical monuments, geological structures and civil constructions by using ultra- and ultra-high-frequency radio waves emitted by a GPR-ground penetrating radar mounted on an unmanned aerial vehicle.

Applications: Identifying buried objects, investigating the conservation status and hidden structural flaws, and highlighting any other types of dielectric inhomogeneities of extensive archaeological sites, historical monuments, geological structures and civil engineering

**Class**

14. Other

**RO.282.****Title EN****Device for the mechanical waves generation into solide materials****Authors**

Chilibon Irinela, Savastru Roxana, Grigorescu Cristiana Eugenia Ana, Vasiliu Ileana Cristina

**Institution****National Institute for Research and Development in Optoelectronics, INOE 2000****Patent**

RO 129592/30.08.2018

**Description EN**

The invention relates to a device for generating mechanical waves in solid materials without destroying the material and

is intended for use in materials science, non-destructive material control, material defects, non-destructive measurement of thickness of structures and elements of various materials (non-metallic, composites) by generating mechanical waves in materials.

**Class** 5: Invention Classification

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**RO.283.**

**Title EN**

**Manufacturing method for photovoltaic cell based on barium stearate and magnesium phthalocyanines**

**Authors**

L. Baschir, S. Miclos, D. Savastru, R. Savastru

**Institution**

**National Institute of Research and Development for Optoelectronics INOE 2000**

**Patent**

Patent application No. A/101001/2017

**Description  
EN**

The invention relates to a method of manufacturing a photovoltaic cell with a glass structure / ITO / PEDOT: PSS / P3HT: PCBM + Ba stearate + carbon nanotubes + phthalocyanines / Al. The method consists of the following steps: preparing the glass support on which the photovoltaic cell will be made, depositing a layer of ITO and making the anode terminal connected to the ITO layer, depositing a layer of PEDOT polymer: PSS, drying at room temperature, then mixing the P3HT and PCBM polymers and preparing an organic solution containing barium stearate, carbon nanotubes and phthalocyanine, then the solution thus obtained is mixed with the P3HT: PCBM mixture and the mixture thus obtained is deposited over the PEDOT: PSS polymer layer, thus obtaining the active layer, which is subjected to heat treatment, finally depositing an aluminum layer over the active layer and making the cathode terminal connected to the aluminum layer.

Applications: Conversion of sunlight directly to electricity-stand-alone systems; electricity for remote areas; disaster relief; scientific experiments; signal systems powering; consumer products; public utilities.

**Class**

2. Energy and sustainable development

**RO.284.**

**Title EN** **Nanostructured multicomponent thin layers based on zirconium carbide with silicon and transition metal addition, resistant to wear and corrosion**

**Authors** Mihai Balaceanu, Alina Vladescu, Viorel Braic, Anca Constantina Parau

**Institution** **National Institute of Research and Development for Optoelectronics - INOE 2000**

**Patent** A00865/ 19.11.2015

**Description EN** The invention relates to nanostructured multicomponent coatings, consisting of nanocomposite Zr-based carbides with addition of Si and one or two transition metals embedded in an amorphous matrix of hydrogenated carbon and/or silicon carbide, used as protective layers for parts subjected to sever wear by simultaneous corrosion, erosion and abrasion..

**Class** Applications : protective coatings for machinery parts  
5

**RO.285.**

**Title EN** **Thin films for improving the bond strength of ceramic to metal in dental restorations**

**Authors** Alina Vladescu, Catalin Vitelaru, Cosmin Mihai Cotrut, Mariana Braic, Mihail Tarcolea

**Institution** **National Institute of Research and Development for Optoelectronics - INOE 2000**

**Patent** A00935/28.11.2013

**Description EN** The invention relates to coating materials used in fixed prosthetic metallo-ceramic restorations, consisting of hard multilayered thin films, resistant to corrosion, used to improve the adhesion between the metal and the ceramic parts.



**RO.286.**

<b>Title EN</b>	<b>Plasmonic chemical sensor in Kretschmann setup</b>
<b>Authors</b>	L. Baschir, S. Miclos, D. Savastru, R. Savastru, A. Popescu
<b>Institution</b>	<b>National Institute of Research and Development for Optoelectronics INOE 2000</b>
<b>Patent</b>	Patent application No. A/10017/ 2017 The invention relates to a plasmonic chemical sensor, made in a Kretschmann assembly. The chemical plasmon sensor consists of a laser diode which emits a laser beam at the desired wavelength for optimal detection of the investigated substance, an input scan mirror which achieves the desired incidence angle, an isosceles prism on which a metal film is deposited and on top there is a calcogenic film in contact with the test medium, a detection scanning mirror, a driver for controlling the two scanning mirrors, a computer which controls the rotation of the mirrors, acquires the measurements and processes the data, a photodetector and an analogue-to-digital converter necessary to data transmission as digital form.
<b>Description EN</b>	
<b>Class</b>	Applications:Environmental monitoring; Homeland security. 1. Environment - Pollution Control

**RO.287.**

<b>Title EN</b>	<b>Thickness determination and layer degradation evaluation procedure by corroborating X-Ray imaging and X-Ray fluorescence spectroscopy</b>
<b>Authors</b>	CHELMUŞ Iulian Alexandru, RĂDVAN Roxana, Gervase Luminița
<b>Institution</b>	<b>National Institute for Research and Development in Optoelectronics – INOE 2000</b>
<b>Patent</b>	Patent application No. A/00938/2017 The invention presents a process with applications in cultural heritage and archeology to obtain quantitative information (thickness) of digital X-rays by converting gray tones using a database. The database contains calibration curves specific to each material and acquisition parameter of the data used.
<b>Description EN</b>	These curves are obtained by performing data acquisition on standard samples of different thicknesses; each thickness (sampled) being attributed to a gray tone. Samples and investigated objects are characterized elementarily using X-ray fluorescence spectroscopy, so choosing the right



calibration curve is ensured. After digital radiography calibration, the thickness of an object can be found using image processing and analysis programs to minimize errors. Applications: Obtaining thickness information from X-rays based on grey scale; Evaluating the conservation status of the object by repeating the measurements after a period of time and comparing the results obtained.

**Class** 14. Other

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**RO.288.**

**Title EN**

**Method for the determination of steroid hormones in aqueous matrix**

**Authors**

Miclean Mirela, Roman Cecilia, Senila Lacrimioara, Levei Erika, Roman Marius, Gog Adrian

**Institution**

**INCDO-INOE 2000, subsidiary Research Institute for Analytical Instrumentation, ICIA**

**Patent**

No. 128663/2017

**Description EN**

Certain invention refers to an analytical method for steroid hormones (estrone and  $\beta$ -estradiol) determination from aqueous environment, by using solid phase microextraction with direct immersion of fiber (DI-SPME), followed by fiber headspace derivatization with N-methyl-N-(trimethylsilyl)trifluoroacetamide (MSTFA) and capillary gas chromatography coupled with mass spectrometry (GS-MS). The advantages of this analytical method are the following:

- no toxic organic solvents utilization;
- high potential in in-situ analysis;
- allows low water samples volume for analyses;
- fast, economically, very versatile, extremely sensitive and a selective analytical method.

**Class**

9

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**RO.289.**

**Title EN**

Method for the determination of estrone and beta-estradiol steroid hormones in aqueous matrix

**Authors**

Miclean Mirela, Roman Cecilia, Senila Lacrimioara, Levei Erika, Roman Marius, Gog Adrian

**Institution**

**INCDO-INOE 2000, subsidiary Research Institute for Analytical Instrumentation, ICIA**

**Patent**

No. 128664/2017

**Description EN**

This invention is a specific and extremely sensitive analytical

method for determining the estrone and beta-estradiol steroid hormones, from aqueous samples (drinking water, residual water, surface water), by solid phase extraction (SPE), followed by the analytes derivatization with MSTFA (N-methyl-N-(trimethylsilyl) trifluoroacetamide) and, simultaneous detection by capillary gas chromatography coupled with mass spectrometry (GC-MS). The method involves water sampling, followed by filtration and acidulation at a pH of 4 to 6. Afterwards, extraction by SPE is done. The analytes are eluted with hexane, ethyl acetate and methanol, evaporated to dryness and derivatized on water-bath by adding N-methyl-N-(trimethylsilyl) trifluoroacetamide.

Class

9

**RO.290.****Title EN**

Method for the determination of steroid hormones in biological matrix

**Authors**

Miclean Mirela, Roman Cecilia, Senila Lacrimioara, Levei Erika, Roman Marius, Gog Adrian

**Institution**

**INCDO-INOE 2000, subsidiary Research Institute for Analytical Instrumentation, ICIA**

**Patent**

No. 128665/2017

**Description EN**

This specific method is an extremely sensitive analytical technique for steroid hormones determination (estrone and  $\beta$ -estradiol) from biological matrix (blood serum), by using direct immersion of solid phase microextraction (DI-SPME); followed by headspace derivatization with N-methyl-N-(trimethylsilyl)trifluoroacetamide and simultaneous detection by capillary gas chromatography coupled with mass spectrometry (GC-MS). The method's advantages are the following:

- the DI-SPME method on specific polymeric fiber allows specific extraction of the analytes without interferences of the matrix;
- using the MSTFA derivatization, much more volatile compounds are obtained, comparing to the ones derivatized by bis(trimethylsilyl)trifluoroacetamide (BSTFA).

Class

9

**RO.291.**

<b>Title EN</b>	Method for obtaining L-polylactic acid
<b>Authors</b>	Majdik Cornelia, Irsai Izabella, Cadar Oana-Alina, Roman Cecilia, Ferenczi Ludovic, Chintoanu Mircea
<b>Institution</b>	<b>INCDO-INOE 2000, subsidiary Research Institute for Analytical Instrumentation, ICIA</b>
<b>Patent</b>	No. 127829/2018 The invention consists of a simple and fast process for the preparation of polylactic acid from L-lactic acid enantiomer (2-hydroxypropanoic acid) using microwave-assisted synthesis, in one step, without solvent, catalyst and secondary products. This synthesis process uses L-lactic acid as raw material (a commercially available product obtained by natural lactic fermentation) and it is based on the microwave-assisted polycondensation reaction. The reaction product, a high purity polymer, has potential to be used in pharmaceutical and medical industries.
<b>Description EN</b>	
<b>Class</b>	3

**RO.292.**

<b>Title EN</b>	Method for obtaining a 60% aqueous solution of technical L-lactic acid by lactic fermentation of whey
<b>Authors</b>	Majdik Cornelia, Irsai Izabella, Cadar Oana-Alina, Gog Adriana, Şenilă Marin
<b>Institution</b>	<b>INCDO-INOE 2000, subsidiary Research Institute for Analytical Instrumentation, ICIA</b>
<b>Patent</b>	No. 128469/2017 The invention consists of a process for obtaining an aqueous solution of 60% technical L(+) lactic acid using fortified whey containing minimum 75 g/L lactose. The method is based on lactose fermentation with <i>Lactobacillus casei</i> , an enantioselective process for the formation of L(+) isomer 90-95%, using a new isolation technique based on extraction with water-immiscible solvents. The obtained aqueous L(+) lactic acid solution can be used, without any further purification, to obtain a wide range of biopolymers for pharmaceutical and food industries, by superior valorification of a by-product of the dairy industry.
<b>Description EN</b>	
<b>Class</b>	3

**RO.293.****Title EN**

Procedure for direct determination of strontium isotopic ratio from liquid samples using an inductively coupled plasma spectrometry method with a quadrupole and single detector

**Authors**

Claudiu Tănăselia, Mirela Miclean, Marin Şenilă

**Institution**

**INCDO-INOE 2000, subsidiary Research Institute for Analytical Instrumentation, ICIA**

**Patent**

No. 129532/2018

**Description EN**

The invention is about a procedure for direct determination of isotopic ratio of strontium from liquid solutions using an inductively coupled plasma spectrometric method, with quadrupole and single detector, for avoiding: more complex instruments, intermediary steps for sample preparation and high costs generated by them, For thus determination to have sufficient precision for a broad enough area of applications, the mass spectrometer needs to be properly calibrated to reduce the negative effect caused by the intrinsic geometry of this type of instruments.

**Class**

1

**RO.294.****Title EN**

Pellet press equipped with mechanical overload protection

**Authors**

Valentin Barbu, Petrin Drumea, Gabriela Matache

**Institution**

INCDO-INOE 2000, Subsidiary Hydraulics and Pneumatics Research Institute INOE 2000-IHP

**Patent**

A/00052 / 29.01.2018

**Description EN**

The invention refers to a pellet press equipped with an elastic system for creating the push-force between the rollers and the sieve disc. This system allows to achieve an approximate constant strength at a wearing of the sieve disc and the pressing rollers up to 2 mm; it also allows the pressing rollers to be moved if metal parts penetrate into the compaction area. The solution is made modular, fact that enables the development, by combining the components, of both the press with drive disc and the press with drive pressing rollers. The solution also includes an axial bearing that absorbs the entire axial load from the pelleting process. This tries to solve problems existing in the current products, such as: decrease in pellet density during the operation of the presses caused by wear of the sieve disc and the rollers when pressing the rollers against the sieve disc is done by a rigid

system, and also possible damage of components or blockage of equipment in case of penetration of metal parts into the compaction zone. The equipment is used to process biomass (wood sawdust, straw, reed, animal remains, etc.) in small granules that can be used in the process of heating a house, farm or any other enclosure.

**Class** 2

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**RO.295.**
**Title EN**

Wind system

**Authors**

Valeriu Dulgheru, Cătălin Dumitrescu, Liliana Dumitrescu, Radu – Iulian Rădoi, Corneliu Cristescu

**Institution**

INCDO-INOE 2000, Subsidiary Hydraulics and Pneumatics Research Institute INOE 2000-IHP

**Patent**

A/00620 – 06.09.2017

**Description  
EN**

The wind system has one or more pairs of vertical rotors as the main elements, the blades of a rotor being fixed with a tilt angle  $\alpha$  of the helix to the right, and the blades of the other rotor are fixed to a tilt angle  $360^\circ - \alpha$  to the left; the shaft of the first rotor is rigidly connected to the rotor of the electric generator with permanent magnets, and the shaft of the second vertical rotor is rigidly connected to the stator of the electric generator; the system features a brake with inertial elements and a brake cylinder. Electricity produced by electrical generators is stored by an inverter in a battery pack or is transmitted to the power grid. The rotors can also be mounted horizontally. Positioning the network of counter-rotating wind turbines in optimal air flow (for example, mounted on buildings at the height of the airflow flowing away from the building) will allow for increased conversion efficiency and increased energy production.

**Class** 2

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**RO.296.**
**Title EN**

Digital Compact Hydraulic Cylinder

**Authors**

Ioan Bălan; Radu - Iulian Rădoi; Alexandru Hristea; Ioan Pavel

**Institution**

INCDO-INOE 2000, Subsidiary Hydraulics and Pneumatics Research Institute INOE 2000-IHP

**Patent**

A/00648 – 14.09.2017

**Description  
EN**

The invention relates to a digital hydraulic cylinder which, by actuating a plurality of pistons, can create at the end of the

## EUROINVENT 2019

main piston a variable force and velocity. The solution consists of a block of 9 pistons that can be operated in a certain sequence.

The digital hydraulic actuator consists of a cylindrical case, closed at both ends by two caps, a main rod and a block containing 9 pistons with a diameter of 20 mm, by means of which the force is made at the outer end of the main rod by sequentially actuating the 9 pistons.

**Class**

2

## Agricultural Research-Development Station Secuieni SCDA Secuieni

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**RO.297.**

<b>Title EN</b>	<i>Cassia angustifolia</i> Vahl. – The ecological cultivation technology for herbs and seeds production under the conditions of the Center of Moldova
<b>Authors</b>	Oana Mirzan, Margareta Naia
<b>Institution</b>	Agricultural Research and Development Station Secuieni, România
<b>Patent</b>	-
<b>Description EN</b>	<p>The plant is mainly valued for its cathartic properties and is specially useful in habitual constipation. The laxative principles sennoside A and sennoside B, isolated from leaves and pods of senna, constitute important ingredients in purgative medicines. The plant has been investigated for its various chemical constituents and pharmacological properties. The advantages of <i>Cassia angustifolia</i> species cultivation in organic farming is obtaining natural products that meet the requirements of consumers and protecting the environment by using ecological technology, while maintaining productive potential.</p> <p>The ecological cultivation technology specific under the Central of Moldovia conditions includes:</p> <ul style="list-style-type: none"> <li>-The basic soil works performed in autumn by cutting at a depth of 30 cm;</li> <li>-Field fertilization with well fermented manure and liquid organic fertilizers;</li> <li>- Preparing the germinative bed is done early spring, as soon as it can enter the field, with the disc harrow in the aggregate with adjustable tiller;</li> <li>- Sowing can be done manually on small surfaces or mechanically with grain sowing machines. Sowing is done as early in spring, at a distance of 25 cm between plants, with 16 kg/ha seeds;</li> <li>- Maintenance work consists of controlling weeds, diseases and pests;</li> <li>- For herbs the optimum harvest time is the maximum flowering of plants and for the seeds it is when the pods have the brown color to the top of the plant.</li> </ul>

**Class**

3

**RO.298.****Title EN****Sorghum - Importance and Technology****Authors**Simona - Florina ISTICIOAIA<sup>1</sup>, Oana MÎRZAN<sup>1</sup>, Teodor ROBU<sup>2</sup>, Gheorghe MATEI<sup>3</sup>, Iulian DRĂGHICI<sup>4</sup>, Valentin VLĂDUȚ<sup>5</sup>**Institution**<sup>1</sup>Agricultural Research and Development Station Secuieni, România<sup>2</sup>"Ion Ionescu de la Brad" University of Agricultural Science and Veterinary Medicine of Iasi<sup>3</sup>University of Craiova, România<sup>4</sup>Research and Development Station for Plant Culture on Sands Dăbuleni, România<sup>5</sup>National Institute of Research and Development for Machinery and Installations for Agriculture and Food Industry București, România**Description EN**

Sorghum is a species of major importance in human nutrition, providing food to the population of 30 African and Asian countries (more than 500 million people). Due to its high drought tolerance and its ability to withstand high temperatures and to efficiently exploit water in Africa, sorghum is the basis of food safety. A great advantage of sorghum is that it is a versatile species that can be cultivated under various pedoclimatic conditions. This advantage has increased the importance of species currently being seen globally as a solution to mitigate the negative effects of climate change. Worldwide, more than 50 % of the sorghum production is used for animal nutrition, but there is currently increasing interest in the use of sorghum in human food, especially as a source of gluten-free food and preparation of beverages.

In the developing countries need to be developed and implemented to cope up with future changes in climate suitable technologies. Improvement of some crop management sequences of sorghum is a matter of great importance for our country, in order to obtain high yields to ensure the necessary food, feed, raw material in the production of bioethanol - considered a fuel of the future. In the conditions of the Center of Moldova (Romania), we have established some technological sequences on sorghum: the sowing epoch, the sowing density, the fertilization of the crop and the control of the weeds.

**Class**

3



**RO.299.**

**Title EN** **Sucesiv – a monoecious hemp variety by ARDS Secuieni**  
**Authors** Constantin Găucă, Diana Popa, Alexandra Buburuz  
**Institution** **Stațiunea de Cercetare – Dezvoltare Agricolă Secuieni**  
**Patent** Patent pending

**Description**  
EN

Sucesiv is a variety obtained from isolation, complex hybridization on families and repeated selection. It is the earliest cultivar of the ARDS Secuieni brand.

In seed crop, it can reach 1.3 - 2.2 m. The stems color is green-yellowish, with 7-9 grooves. The leaf is palmate - ficate, composed of 5-7 leaflets. The inflorescence is a compact scorpioid cyme, with the male flowers arranged at the base.

The vegetation period is 90 - 110 days in seed culture. The flowering period is of 10 - 15 days, being a cultivar resistant to the heat and fall, as well as to the broomrape and Fusarium.

It can be grown under both classical and successive systems, after pre-cultures that are harvested until June 20th, no later than July 1st, under the conditions of an irrigation system.

Yield capacity is of 900-1200 kg/ha seed in main crop and 800 - 1100 kg/ha in successive system.

This variety is recommended to be cultivated both in the South of the country and the Western Plain, as well as in the Center and North of Moldovia.

Class

3



## HONEYWELL ROMANIA SRL

RO.300.

**Title****Hydrogen sulphide sensor and method****Authors**

Bogdan- Catalin Serban, Octavian Buiu, Cornel P. Cobianu, Mihai Brezeanu

**Institution**

Honeywell Romania S.R.L. (current assignee)

**Patent no.**

US 9, 932, 449 B2, April 3, 2018

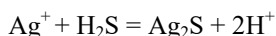
**Description**

The hydrogen sulfide sensor claimed in this invention includes a substrate (glass or quartz.), a pair of interdigitated electrodes supported by the substrate and a nanocomposite-based sensing layer deposited on the interdigitated electrodes and configured to interact with hydrogen sulfide.

The sensing layer is based on polyaniline (emeraldine base), an inorganic compound such as such a silver (I) salt, and an isolator polymer such as at least one of polyvinyl acetate, polyvinyl chloride, or a clay (montmorillonite, kaolinite, muscovite or bentonite). The sensing layer can include about 5 wt % to about 10 wt % isolator polymer or clay and about 5 to about 10% wt % metal salt.

The sensing principle is based on the increase in the conductivity of the film containing emeraldine and metal salts, due to the reaction between the inorganic salt and H<sub>2</sub>S. The mineral or organic acid, once formed, can protonate emeraldine base with formation of conductive polyaniline (Fig.1). Thus, in one approach, sensing structure comprises three key elements: derivative of emeraldine base, silver(I) salt (acetate, nitrate, i.e) and an isolator polymer such as polyvinyl acetate. In the second approach, the isolator polymer is replaced by clay such as montmorillonite. Both isolator polymer and clay have the role to improve the thermal behavior of the sensitive matrix nanocomposite.

This sensing approach proposal is in good agreement with the HSAB principle: H<sub>2</sub>S, which is a soft base, has a strong interaction with cations like Ag<sup>+</sup>, classified as soft acids:

**Class**

2

**RO.301.**

**Title** Quantum dot solar cell  
**Authors** Bogdan Serban, Mihai N Mihaila, Stephan Dan Costea, Octavian Buiu  
**Institution** Assignee: Honeywell International Inc. Morristown, NJ (US)  
**Patent no.** US8, 227, 687B2

**Description**

Among the emerging photovoltaics technology, quantum dot – sensitized solar cells (QDSSCs) has drawn considerable interest in the last decades due to their outstanding properties, such as theoretical conversion efficiency up to 44% and the capacity to perform light harvesting in a broad solar spectrum region.

This invention presents a quantum dot solar cell structure which consists of n-type semiconductor / bifunctional linker (ligand) / quantum dot / p-type semiconducting polymer. TiO<sub>2</sub> or ZnO act as n-type semiconductors, while inorganic quantum dots such as CdS, CdSe, CdTe are light absorbers. The ligand possesses a first anchor group that bonds to the quantum dot and a second anchor group that bonds to the electron conductor.

According to the HSAB rule, the Cd<sup>2+</sup> cations which can be found at the surface of selected quantum dots are classified as soft acids. Therefore, they prefer to bond with mercapto group, thioether group, which are soft bases.

Thus, the first fundamental step in the functionalization of quantum dots is the selection of either a suitable soft acid - soft base pair. Following this strategy, a series of novel ligands were introduced in the design of quantum dot solar cell structure such as 2 -[ 2-ethoxycarbonylmethylsulfanyl)ethyl] - 1,3-thiazolidine-4-carboxylic acid, 2-acetylamino-3-benzylsulfanyl propanoic acid, isocysteine, 2-[(2-oxothioloan-3-yl)carbamoylmethylsulfanyl]acetic acid, phytic acid.

A covalent bond between quantum dots and the polymer increases the charge transfer and the miscibility of the components and avoids segregation of phases.

Strong quantum dot - hole conductor interface can be obtained by using polymers designed according to specific principles of coordination chemistry (Fig.1)

**Class**

2

**RO.302.**

<b>Title</b>	<b>Chemiresistive ethanol sensor</b>
<b>Authors</b>	Bogdan-Catalin Serban, Octavian Buiu, Cornel Cobianu, Octavian Ionescu, Dragos Varsescu, Roxana Marinescu, Nicolae Dumbravescu
<b>Institution</b>	National Institute for Research and Development in Microtechnologies - IMT Bucharest
<b>Patent no.</b>	Application No. A00232, 28.03.2018, OSIM, ROMANIA
<b>Description</b>	<p>The invention includes the design and manufacturing processes for a new chemiresistive ethanol sensor, employing a nanofiber composite material - <math>\text{TiO}_2</math> / <math>\text{La}_2\text{O}_3</math> / oxidized carbon nanohorns - as sensing layer. According to HSAB theory, ethanol is classified as a strong base, while <math>\text{TiO}_2</math> (by <math>\text{Ti}^{4+}</math> ions) as well as <math>\text{La}_2\text{O}_3</math> (by <math>\text{La}^{3+}</math> ions) are strong acids, so a "hard acid-hard base" interaction between the analyte and the sensitive layer being feasible. The ethanol sensor includes a dielectric substrate, such as glass, electrodes (Al, Co, Cr) and a sensing layer. The raw materials required for sol synthesis are: starting precursor (titanium (IV) ethoxide), solvent (absolute ethanol), catalyst (nitric acid), water, oxidized carbon nanohorns, <math>\text{La}_2\text{O}_3</math>. Precursor - ethanol molar ratio is 1:9. Magnetic stirring is carried out for 2 hours at <math>70^\circ\text{C}</math>. The deposition of the synthesized sol is performed by the spin coating, after previously masking the contact area. Sensitive layer annealing is achieved by heat treatment at <math>450^\circ\text{C}</math> for 30 minutes in air, with a heating rate of <math>5^\circ/\text{minute}</math>. Oxidation of carbon nanohorns is accomplished by treatment with <math>\text{H}_2\text{O}_2</math> at <math>100^\circ\text{C}</math>. Electrodes can be linear, planar or can have interdigitated configuration.</p> <p>Among the advantages of the proposed sensing layer we can mention:</p> <ul style="list-style-type: none"> <li>• Improved mechanical properties and better processability of the sensing layer;</li> <li>• Large surface area of sensing layer;</li> <li>• Detection over a wide range of temperature (<math>25^\circ\text{C}</math> - <math>400^\circ\text{C}</math>);</li> <li>• Fast response;</li> <li>• Increased selectivity;</li> </ul>
<b>Class</b>	5

**RO.303.**

<b>Title</b>	<b>Sensing layer for ethanol sensing and method for making it</b>
<b>Authors</b>	Bogdan-Catalin Serban, Octavian Buiu, Cornel Cobianu, Octavian Ionescu, Dragos Varsescu, Viorel Avramescu, Roxana Marinescu, Nicolae Dumbravescu
<b>Institution</b>	National Institute for Research and Development in Microtechnologies - IMT Bucharest
<b>Patent no.</b>	Application No. A00228, 28.03.2018, OSIM, ROMANIA
<b>Description</b>	<p>The invention presents the design and manufacturing processes for a new chemiresistive ethanol sensor, employing a nano composite material – CuO oxidized carbon nanohorns - as sensing layer. The ethanol sensor includes a dielectric substrate, such as glass, electrodes (Au, Pt) and a sensing layer. The raw materials required for sol synthesis are: the precursor (copper acetate), the solvent (isopropanol), the stabilizer (poly(2-ethyl-2-oxazoline) and the oxidized carbon nanohorns. The precursor <math>\text{Cu}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}</math> - isopropanol molar ratio is 1: 3. Magnetic stirring is performed sequentially in two steps: 1) at 50° C for 1h; 2) at 60° C for 1h. In the second step of magnetic stirring, the oxidized carbon nanohorns are added. The solution is stabilized at room temperature for 12h. The deposition of the synthesized sol is performed by spin coating, after previously masking the contact area. The annealing of the sensitive layer is performed sequentially, in two steps, by heat treatment: 1) in air, for 10 minutes, at 300° C; 2) in air, for 1h, at 400° C. Oxidation of carbon nanohorns is performed by treatment with <math>\text{H}_2\text{O}_2</math> at 100° C. Electrodes can be linear, planar or can have interdigitated configuration. Among the advantages of the proposed sensing layer we can mention:</p> <ul style="list-style-type: none"> <li>• Improved mechanical properties and better processability of the sensing layer;</li> <li>• Large surface area of sensing layer;</li> <li>• Detection over a wide range of temperature (25° C - 400° C);</li> <li>• Fast response;</li> <li>• Increased selectivity.</li> </ul>
<b>Class</b>	5 3

**RO.304.**

**Title** **Fluorescence quenching based oxygen sensor**  
**Authors** Bogdan – Catalin Serban, Mihai N. Mihaila, Octavian Buiu  
**Institution** Honeywell International Inc. (current assignee)  
**Patent no.** US 8,747,750 B2

Determination of oxygen concentration is important in various fields such as automotive applications, medical devices, anesthesia monitors, and environmental monitoring. Fluorescence quenching based oxygen sensing is a valuable option for oxygen detection at room temperature.

Fluorophores used for oxygen sensing include pyrene and its derivatives (1-pyrenyl methanol, pyrene-1-acetic acid, pyrene-1-dodecanoic acid, pyrene - 1-decanoic acid), quinoline, decacyclene and its derivatives, phenantrene, fluoranthene, erythrosine B, etc. These fluorophores are incorporated into a polymer matrix such as: ethyl cellulose, silicones, polystyrene that are selectively permeable to oxygen and adhere to glass.

One difficulty with incorporating fluorescent molecules into a polymer is that the fluorophore may have poor solubility and may crystallize or aggregate within the polymer matrix upon coating and drying.

**Description**

In order to suppress aggregation and leaching, the fluorophore can be grafted in the polymeric substrate through covalent bonding.

This invention presents novel methods to covalent immobilization of different fluorophores in the polymeric substrate such as functionalized polystyrene. Polystyrene is a useful polymer as it is inexpensive, selectively permeable to oxygen, and adheres to various substrates.

In one embodiment polystyrene is chloromethylated using chloromethyl methyl ether in the presence of zinc chloride. The chloromethylated polystyrene is treated with sodium iodide in acetone (Finkelstein reaction) to form iodomethyl polystyrene. Iodomethyl polystyrene reacts with the carboxylic acid salt of a 1-pyrene alkylene carboxylic acid at elevated temperature in the presence of tetramethylammonium iodide as a phase transfer catalyst to generate the compound depicted in Fig. 1.

**Class**

3

## SC HOFIGAL EXPORT -IMPORT SA

**RO.305.**

<b>Title</b>	<b>PROCEDURE FOR OBTAINING A TOTALLY CONCENTRATED EXTRACT OF CHEMICALS (CHELIDONIUM MAJUS) WITH ANTIMICROBIAL, ANTIVIRAL, ANTITUMORAL AND IMMUNOMODULAR ACTIVITY</b>
<b>Authors</b>	<i>Coralia Bleotu<sup>1</sup>, Mariana Carmen Chifriuc<sup>2</sup>, Cristina Manea<sup>3</sup>, Lilia Matei<sup>1</sup>, Laura Denisa Dragu<sup>1</sup>, Irina Daniela Alexiu<sup>1</sup>, Popa Marcela<sup>2</sup>, Carmen Cristina Diaconu<sup>1</sup>, Mihaela Chivu-Economescu<sup>1</sup>, Ana Iulia Neagu<sup>1</sup>, Marutescu Luminita Gabriela<sup>2</sup>, Alexandru Georgeta<sup>3</sup>, Laura Georgiana Necula<sup>1</sup>, Cristina Mambet<sup>1</sup>, Suciu Alexandru<sup>3</sup>, Iuliana Crisan<sup>3</sup>, Carmen Curutiu<sup>2</sup>, Liliana Burlibasa<sup>2</sup>, Nicoleta Constantin<sup>2</sup>, Veronica Lazar<sup>2</sup></i>
<b>Patent no.</b>	Granted
<b>Description</b>	The invention relates to the obtaining of the total concentrated extract of Chelidonium majus (EATC) and the demonstration of the pharmacological antiviral, antimicrobial, antitumoral and immunomodulatory effect of this concentrate extract (EATC).
<b>Class</b>	4

**RO.306.**

<b>Title</b>	<b>Larvalbina</b>
<b>Authors</b>	<i>Manea Ștefan</i>
<b>Patent no.</b>	<b><i>B.I. a 2012 00103</i></b>
<b>Description</b>	The product is an association of three types of raw materials: vegetable oils from white sea buckthorn ( <i>Hippophae rhamnoides</i> ) and linseed ( <i>Linum usitatissimum</i> ), spirulina biomass from two cyanobacterial species ( <i>Arthrospira platensis</i> and <i>Arthrospira maxima</i> ) total dermatitis larva extract. Sea buckthorn oil contains mainly carotenes, vitamins D, E, K, F, lecithins in a readily assimilable form, unsaturated fatty acids, especially $\gamma$ -linoleic acid, a prostaglandin precursor.
<b>Class</b>	4

**RO.307.**

**Title** **Omega 3 & 6**

**Authors** *Manea Ștefan*

**Patent no.** RO 126918

The product is more than the vegetable variant of many fish oil forms known as Omega 3. Contains in a well-balanced ratio of 1: 3 Omega 3 and Omega 6 fatty acids.

**Description**

Vegetable oils from flaxseed, hemp and non-grain seeds obtained by cold pressing are a direct source of omega-3 fatty acids (alpha-linolenic acid, EPA and DHA) and Omega-6 (linoleic acid) in a ratio (1: 3) optimally balanced to obtain Omega 3 & Omega 6 plant product.

**Class**

3



## S.C. BIOTEHNOS S.A.

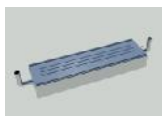
RO.308.

<b>Title</b>	<b>Innovative association between entomological compounds and plant extracts in order to design pharmaceutically active complexes</b>
<b>Authors</b>	Laura Olariu <sup>1,2</sup> , Brindusa Dumitriu <sup>1</sup> , Diana Manuela Ene <sup>1</sup> , Luiza Mariana Craciun <sup>1</sup> , Adelina Bicu <sup>1</sup>
<b>Institution</b>	1. S.C. Biotehnos S.A., Otopeni, Ilfov, Romania 2. Academy of Romanian Scientists - associate member, Bucharest, Romania
<b>Description</b>	<p>The concept of study is starting from the structural and functional diversity of entomological compounds whose biological effects are complementarily sustained by active principles from vegetal extracts. Two bio-complexes from <i>Lymantria sp.</i>: Adenoprosin, with anti-proliferative and pro-apoptotic action on prostate cells and Keratoliz, a keratolytic complex with anti-inflammatory and skin-regenerative effects on keratinocytes and fibroblasts were tested in order to establish their synergy with phyto-estrogens in cellular homeostasis modulation. The phyto-estrogens that we have focused on are diosgenine from <i>Trigonella foenumgraecum</i> and a complex of daidzein, genistein, biochanin and formononetin from <i>Trifolium pratense</i>.</p> <p>We pointed out on prostate cancers and skin hyper-proliferative disorders (melanoma). The experimental investigations were performed on standardized cell lines PWR-1E (prostate dysplasia), DU145 (metastatic cells of prostate adenocarcinoma) and B16-F10 (murine melanoma), aiming to follow the main key mechanisms of disease progression: apoptosis and cell cycle sequentiation, the invasiveness promoters metalloproteinase MMP2 and MMP9 and melanin content as malignancy indicator in melanoma. The flow cytometry and gelatin zymography techniques highlighted anti-tumor, compound - specific properties of active principles from entomological sources. The phyto-estrogen structures from vegetal extracts presented anti-proliferative and anti-melanoma "in vitro" effects suggesting their association with entomological compounds in order to maximize the anti-cancer efficacy.</p> <p>The novelty of research and the relevance of results obtained on three standardized cell lines representative for tumors pathologies opens new perspectives in natural resources capitalization worldwide. Biotehnos facilities bring together scientific expertise and know-how for innovative product design to transform this field of knowledge in new therapeutic solutions.</p>

## SC DFR Systems SRL

### RO.309.

<b>Title</b>	Air diffuser used in wastewater treatment
<b>Institution</b>	Ioana Corina Moga, Gabriel Petrescu
<b>Authors</b>	<b>DFR Systems SRL</b>
<b>Patent no.</b>	Patent application No. A/01027/ 03.12.2018
<b>Description</b>	The air diffuser is used in wastewater treatment processes. It is a fine bubble air diffuser that will be used in biological wastewater treatment processes with attached biomass on mobile supports. The invention relates to a fine-bubble air diffuser made from metallic anti-corrosion resistant materials. The diffusers main components are: an outer casing, closed at the ends with 2 caps; a top perforated plate with holes in the range of 0.3- 0.5 mm. The perforated plate is provided with semicircular sections where the holes are made.
<b>Class</b>	1



### RO.310.

<b>Title</b>	<b>Exploiting fungi potential for recalcitrant compounds removal from cellulosic wastewaters - FUNCELL</b>
<b>Authors</b>	Ioana Corina Moga, Gualtiero Mori, Ovidiu Iordache, Elena Andolfi, Giulio Munz, Simona Di Gregorio, Stefano Batistini, Alessandra Bardi, Francesco Spennati Gabriel Petrescu, Bogdan Doroftei
<b>Institution</b>	<b>DFR Systems SRL</b> <b>Consorzio CuoioDepur SpA</b> <b>The National R&amp;D Institute for Textiles and Leather</b> <b>Opus automazione spa</b> <b>University of Florence</b>
<b>Description</b>	FUNCELL consists is the development of an innovative mycobased tertiary treatment for tannery and papermill wastewaters efficient in removing tannins and absorbable organic halogen (AOX), not depleted by consolidated bacterialbased processes. The costs of treatments for m3 of wastewaters will be reduced and qualitative improvements in the treatment of wastewater are envisaged. FUNCELL is based both on modern processes for biological treatment (Moving Bed Biofilm Reactor, MBBR) and on biological nonconventional processes catalyzed by fungi [WhiteRotFungi (WRF) and Ascomycota (ASC)]. An innovative carrier,

based on polyethylene supports, will be developed for optimizing the fungal biomass growth in system where bacteria are competitive. A pilot of an innovative MBBR designed for fungi will be set up and tested. An innovative approach to monitor and automatize the reactor, based on a specifically designed differential respirometer, will be constructed. The TRL 6 level will be reached. FUNCELL's objective is the 15-20% reduction of the investments in wastewater treatment plants, compared to actual technologies, comprising anaerobic treatments dedicated to the depletion of AOX.



**RO.311.**

**Title**

**Instalation for the recovery of the treated water generated by small agrozootechnical farms**

**Authors**

Ioana Corina Moga, Gabriel Petrescu, Bogdan Doroftei, Georgiana Pantazi, Marin Eugen, Iulian Voicea

**DFR Systems SRL**

**Institution**

**National Institute of Research - Development for Machines and Installations Designed to Agriculture and Food Industry - INMA**

**Description**

Recirculation of wastewater appears as a process that can ensure a better quality of the surface waters. The irrigation process that use discharged wastewater, after a proper treatment, appears as a method that can provide a double advantage. This fact reduces the quantities of wastewater discharged into the receiver and, on the other hand, ensures the moisture for the cultivated soil.

The wastewater treatment plant within the present project is coupled to an irrigation system, and the whole system is independent form the energetic point of view. The plant is treating the wastewaters generated by small agro-zootechnical farm.

The wastewater treatment plant consists of a continuous monitoring system and a water distribution network for irrigation. Energy autonomy is based on green energy, a hybrid system being implemented based on photovoltaic panels and wind turbine.



## Continental Automotive Romania SRL Continental Powertrain Engineering SRL

**RO.312.**

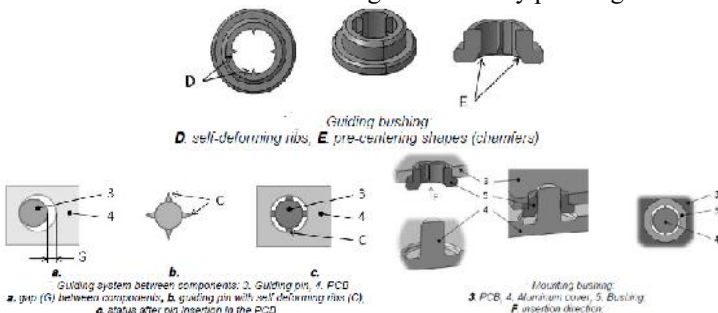
**Title** Self-deforming guiding bushing for PCB positioning  
**Authors** Constantin Bitca, Mircea Teodor Emil  
**Institution** Continental Automotive Romania  
**Patent no.** 2017P00078 DE

The invention provides a solution for some applications when a PCB (printed circuit board) needs to be positioned on an aluminum component (or another component where hardness of the material is bigger than hardness of the PCB materials). In this case an intermediate plastic bushing provided with some self deforming ribs (D) is used for guiding of the PCB. Because the ribs cannot be designed on the aluminum components, then an additional bushing is used to assure the guiding. The bushing should have also some pre-centering shapes (chamfers - E) for a better positioning of the guiding pin during the assembling process.

**Description**

The bushing proposed is mounted by pressing in order to avoid the removing from PCB because of the vibrations from assembling line.

During the insertion of the guiding pin into guiding hole provided with self-deforming ribs, the ribs will be equally deformed and will force the pin (from cover) to negotiate a concentrically position related to the guiding hole (from plastic bushing). This means that the tolerance chain will be reduced, depending how these ribs are dimensioned. The gap between PCB hole and outer diameter of the bushing is zero because the bushing is inserted by pressing into PCB.



**RO.313.**

**Title** Rotor for an electric machine of a vehicle

**Authors** Dragos Murgoci

**Institution** Continental Powertrain Engineering SRL /

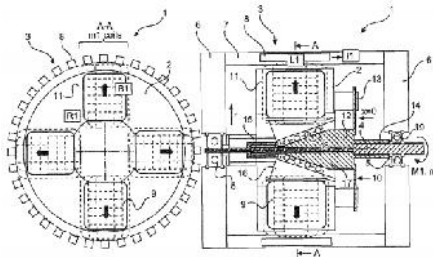
**Electrical engineering, energetics and applied informatics Faculty, "Gheorghe Asachi" Technical University Iasi**

**Patent no.** WO2019038079 / EP344788, Patent application 17465540.7/2019

**Description** The invention relates to a rotor (2) for an electric machine (1) of a vehicle. The rotor (2) comprises permanent magnets (9), receptions for the permanent magnets (9) and deformation means (10). The permanent magnets (9) are adapted to be deformed elastically and are arranged within the receptions, which are designed such that the permanent magnets (9) can deform within the receptions. The deformation means (10) are adapted to deform the permanent magnets (9) such that at least one of a magnetic induction (B), a conductor length (L) and a rotor radius (R) is adjusted.

**Class**

8



**RO.314.**

**Title** Driver Hands On/Off Detection Using Filtering Techniques

**Authors** Rafaila Razvan, George Marian Grosu

**Institution** Continental Automotive Romania

**Patent no.** 2016P07211 DE

**Description** The present invention seeks to solve the problems related to wrong detections of the hands on/off algorithm due to road bumps and automatic steering interventions. In this sense, the invention proposes a hands on/off detection algorithm, simple and robust to external influences.

This invention proposes a new solution of detecting the driver hands on/off the steering wheel, based on estimating the driver

applied torque, and analyzing the angle component induced in the steering angle by the driver applied torque. This is done by means of using the transfer functions which describe the system dynamics between the steering wheel angle speed, steering torque sensor to the driver applied torque and further, between the driver applied torque to steering wheel.

Class

8

**RO.315.****Title**

Method of diagnosing failure in a brake ECU using the integrates gyro (Combo2) sensor

**Authors**

Maftai Alexandru, Rudac Mihaela

**Institution**

**Continental Automotive Romania**

**Patent no.**

2017P02639 GB

Abnormal working of the valves or electrical motor due to wear, in the brake application projects cannot be done automatically by the system without additional equipment. All other existing solutions for diagnosing through vibration analysis imply the use of an additional outside system that is measuring the vibrations. This means higher costs and extra maintenance of the diagnosing apparatus.

**Description**

The proposed invention will make a better brake system (Brake Pump ECU and ABS ECU) diagnosis. The solution will be capable of self-diagnosing the status of every valve in the valve block and also the electric motor and preventing further damage of the braking system of the automobile. The solution will not imply additional components in the system of the actual Brake Pump and ABS ECU. The ECU Software code is adapted and specific command lines activate the electric motor and hydraulic valves individually performing a system test, in this way the Combo2 sensor will measure the vibration given out by the electric motor and by every valve separately. Afterwards taking the information that he reads; the information is compared to a pre-learned vibration pattern.

Class

8

**RO.316.****Title**

Traffic jam assist deactivation warning

**Authors**

Tarzioru Bogdan

**Institution**

**Continental Automotive Romania**

**Patent no.**

2016P07379 DE

**Description**

The invention relates to a method for warning the driver when the traffic jam assistant of the vehicle turns off. Traffic jam assistants are known, for example, from US 2010/324797 A1. The vehicle automatically follows the vehicle ahead and maintains a predetermined minimum distance. If the traffic jam situation no longer exists, the driver must take over the control of the vehicle again. Object of the present invention is to warn the driver effectively before switching off the traffic jam assistant and to direct his attention back to the steering of the vehicle. Object of the present invention is to warn the driver effectively before switching off the traffic jam assistant and to direct his attention back to the steering of the vehicle. The method according to the invention for warning a driver before deactivating a traffic jam assistant in a vehicle comprises the following steps, establishing a connection to a driver's mobile device and displaying a warning message on the driver's mobile device when the traffic jam assistant is deactivated.

**RO.317.**

**Title** **Single shunt measurement strategy improvement for 3 phases motors**  
**Authors** Turcanu Alexandru  
**Institution** **Continental Automotive Romania**  
**Patent no.** 2016P06994 DE

**Description**

The invention relates to a method for operating an electronically commutated synchronous machine with multiple phases, in particular three phases. An actuation circuit (1) is provided for operating the synchronous machine, said actuation circuit having at least two switches (5) for each phase and being used to periodically ascertain a degree of actuation for each phase. In order to ascertain the degree of actuation, an activation duration is determined during which the respective phase is supplied with a supply voltage via the paired switch (5). The following steps are carried out: - measuring a current by means of a single measurement resistor (3) in at least two measurement windows (M1, M2; 20, 22) and - displacing one or more of the activation durations of the different phases relative to one another as soon as the difference between activation points of at least two phases falls below a minimum duration ( $t_d$ ) or as soon as the difference between the activation durations of at least two phases falls below double the minimum duration ( $t_d * 2$ ). The invention additionally relates to an actuation circuit.

**Class**

8

## Electroputere VFU Pascani SA

**RO.318.**

**Title**

**Redesign and Reconstruction of double deck passenger coaches, with the new series: 26/84/36-16**

**Institution**

**Electroputere VFU Pascani SA**

The 26-26 series passenger coaches have been manufactured starting with the 80's, by VEB Waggonbau Goerlitz, Germany. Romania had imported more than 200 coaches of this type, with the purpose to use them on short distances, due to the big transport capacity, being double deck type. In Europe, railway vehicles reconstruction is wide spread, due to some important benefits:

- the costs are lower than for the acquisition of new vehicles;
- resources consumption economy and environment impact – in order to reuse the metal for new constructed vehicles, it must be melted, casted and worked again;
- from the analysis made on the donor vehicles, it has been concluded that the metal structure allows another 15-20 years of operation if overhauled;
- the new exterior and interior is in tone with the latest designs;
- the modernization of the vehicle is done with the purpose to respect the latest safety, security and comfort norms.

**Description**

In order to reconstruct the 26-26 series passenger coaches, Electroputere VFU Pascani SA uses the concept „Redesign and Reconstruct”, based on which will result a 70-80% new vehicle. The new equipment includes: HVAC (Heating, ventilation, and air conditioning), comfortable seats with tables, led lightening, windows with low light entrance, automatic doors, video surveillance cameras, modernized bogies and braking system. Electroputere VFU Pascani SA had provided reconstruction services, for more than 165 coaches and it is working on another batch of 17, for the national operator SNTFC CFR CALATORI.





## Arexman Construct SRL

**RO.319.**
**Title**

iSentinel® Advanced Plus – the earthquake intelligent protection system

**Authors**

Mircea Manolescu

**Institution**

Arexman Construct

**Patent**

RO123492

**Description**

The system is structured on three levels: detection / decision / action. At the beginning conceived to save the human life and protect the assets, it was developed to react at any other threat, even if an earthquake is not present: gas leakage, fire and any other personalized threat by triggering the right protection procedure: cut the gas, water or power supply, initiate the secondary power supply, bring the elevators on the ground floor, stop moving engines, centrifuges, isolate the poisoning substances reserve, safety instructions guidance, remote alarm etc.

It will save thousands of lives during next major earthquake by both alerting people of the imminence of a major strike and triggering the right protection procedure. Thus, it ensures the life and assets protection but also the business continuity by acting as an integrate protection, by the mean of the connection with the B.M.S. (Building Management System)

**Class**

12



**Romanian Association for Alternative Technologies Sibiu  
- A.R.T.A. Sibiu**

**RO.320.****Title**

"Procedure for obtaining of hempseed oil enriched with Hibiscus extract, resistant to thermo-oxidative degradation"

**Authors**

Oancea Rodica Simona, Drăghici Olga, Perju Mirabela

**Patent**

Patent application A 2018 01008 / 29.11.2018

**Description**

The invention relates to a procedure for the improvement of thermo-oxidative stability of edible hempseed oil as rich source of polyunsaturated fatty acids (PUFAs) known for their human benefits, through the addition of a natural extract from Hibiscus sabdariffa. This procedure presents the advantage of lipid protection against oxidation and of rising shelf life of the product, thus increasing bioavailability of PUFAs. The invention has practical significance either through sustainable utilization of resources rich in bioactives for the development of extracts with strong antioxidant properties, or by application of sustainable technologies for reduction of the use of synthetic food additives.

**Class**

3

**RO.321.****Title**

"Instalation for checking the verticality of mine shafts"

**Authors**

Bălan George, Țițu Aurel Mihail, Dima Nicolae, Oprean Constantin, Ceocea Costel

**Institution**

Romanian Association for Alternative Technologies Sibiu - A.R.T.A. Sibiu

**Patent**

Patent application A 2019 0042 / 28.01.2019

**Description**

The invention relates to an installation for checking the verticality of mine shafts, being applicable both to active control and direction of digging and equipping of new mines, as well as determining the verticality of the supporting and guiding elements during the subsequent exploitation of the existing mine shafts. This is absolutely necessary for the normal and safe operation of personnel, machinery and installations, given that over time the integrity of the mine shaft as well as its initial parameters, and in particular its verticality, can be affected.

**Class**

6

**RO.322.**

<b>Title</b>	"Hemispheric individual electric car with rotary seat"
<b>Authors</b>	Țițu Aurel Mihail, Oprean Constantin, Mărginean Ion, Moldovan Alexandru Marcel, Bogorin Predescu Adrian, Țițu Ștefan
<b>Patent</b>	Patent application A 2017 00053 / 3.02.2017
<b>Description</b>	The electric car has a hemispherical body and a suspension made of low number parts, based on a leaf spring, star-shaped mounted under the body and fitted with four arms with independently attached wheels, by fitting each wheel to a simplified fork without helical springs. Steering direction control is not from a steering wheel, but by manually turning to the left or right a joystick, which also controls the speed of the machine. To preserve the human binocular vision when reversing the machine, the rotation with 180 degrees of the seat is provided. The seat is centrally disposed, rotating simultaneously with the driver's body so that it can directly look behind, without using the mirror when reversing, for better obstacle avoidance, after which the seat rotates back in the initial forward position. The hemispherical shape allows for the fitting of a honeycomb structure in the front and rear part of the body to cushion the shock of impact in traffic accidents. The invention has some of the following advantages: reducing the car's own weight, reducing the car's cost price, reducing energy consumption per kilometer, ease of parking.
<b>Class</b>	8

**RO.323.**

<b>Title</b>	"Bicycle with enhanced energy recovery system"
<b>Authors</b>	Țițu Aurel Mihail, Oprean Constantin, Bondrea Ioan, Mărginean Ion, Moldovan Alexandru Marcel, Bogorin-Predescu Adrian, Iuonaș Ioan-Dănuț
<b>Patent</b>	Patent application A 2013 00826 / 11.11.2013
<b>Description</b>	The invention refers to a command and control system which equips an electrical bicycle. The system leads to the increase in movement autonomy of the bicycle by increasing the energy percentage recovered in the batteries realizing a voluntary physical effort, insuring movement autonomy, having at its disposal a command and control system.
<b>Class</b>	2

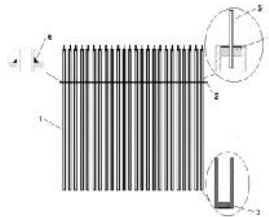
**MG BIOTECH SRL****RO.324.****Title EN****Energy recovery from burnt gases using thermal tubes vacuumed at high temperatures****Authors**

Muscalu Gheorghe

**Institution****MG BIOTECH SRL**

-

The invention (Romanian patent no: 131146 B1) refers to a thermal tube obtaining procedure. The thermal tube is made from a copper pipe (1) sealed at both ends (3, 4). The seal at one end (4) has a central orifice in which enters a capillary (5) which will later be sealed. The filling with working fluid takes place after welding ensemble (6) comprised from thermal tubes and the median plate (2). The tubes are filled by consecutive heating and cooling of each thermal tube, using an acetylene-oxyhydrogen torch. The tubes are heated up to a temperature at which non-condensable gases are evacuated. In the next step, the working fluid is introduced in the tube, by cooling the thermal tube with water. All the elements which form the ensemble are made of copper with 94% to 99,9% concentration. Achieving of a higher thermal efficiency for technological processes in all Romanian industries and not only, occupies an important place on the priority list. It is a well-known fact that approximately 10 – 12% of the energy used for oven heating, thermal central units and others, is thrown away on the evacuation system for burn gas. Even so, the energy recovery is very little implemented in manufacturing industries. The energy recovery systems can raise the energy efficiency of ovens and generators from 88% - 90% to 99%. These are Gas – Water and Gas – Gas type and can be implemented on all types of gas evacuation systems of the bread baking ovens and steam/hot water generators.

**Description****EN**

## Individual Inventors

**Carmen Emilia SUCIU**

**RO.325.**

**Title**

Regenerating And Age Reversal Raw Vegan Chocolate With Gold, Platinum And Silver Nanoparticles And Telomeres

**Authors**

SUCIU CARMEN EMILIA

**Patent**

RO131701(A2) – 2017-03-30

**Description**

The regenerating and age reversal raw vegan chocolate with gold, platinum and silver nanoparticles and telomeres aims at regenerating and renewing the organism by genetic editing at a higher level. This is due to the telomeres and the gold, platinum and silver nanoparticles. The other active ingredients enrich the chocolate thus aiding in this process: honey, dried fruits, cocoa and coconut butter, while the other ingredients such as essential oils have a detoxifying effect and contribute to the regeneration process. The high quality, raw and organic raw materials combined with the manufacturing technology at human body temperature preserve all these active substances and effects.

**Class**

4

**Gheorghe SALAN****RO.326.**

**Title** Sallas device for the amendment of the flow of fluid through the pipes and ducts and the placement process and fitting the sallas device for internal combustion engines and in long lines

**Authors** Sălan Gheorghe

**Patent** Regular National deposit No. a 2018 00626; Patent application No. A 00154/2019

**Description** The automotive industry now has a major concern. Pollution. The huge investments made have not prevented unburned particles from exhausting. This demonstrates that there are possibilities to improve the combustion. We invented a simple and inexpensive device to change the flow of fluids through pipes and intake and evacuation ducts for internal combustion engine. The SALLAS device reduces the losses by rubbing together the fluid particles and the walls of the pipe. Increases the flow of the fluid without kinetic energy input. Ensures more fluid mixing of the fluids on the track or in containers. Substantially reduces pipeline transport costs. In the case of internal combustion engines the SALLAS device provides greater fluid flow through the engine, more intimate mixing of fuel and air with spectacular consequences in reducing consumption. Can precisely dose the required air depending on the engine regime to reduce nitrogen oxide emissions, and opens new perspectives for diversifying fuels such as biofuels or water fuel emulsions. The SALLAS device improves combustion and engine performance. An engine torque and higher power are obtained and are maintained over an important speed range. Faster entry to turbocharger and firm and faster acceleration response. It enhances driving pleasure, making the engine more elastic and more suited to clearer and more powerful exhaust sound.

1,2,8,9,14



**RO.327.**

**Title**

**Chair**

**Authors**

Sălan Gheorghe

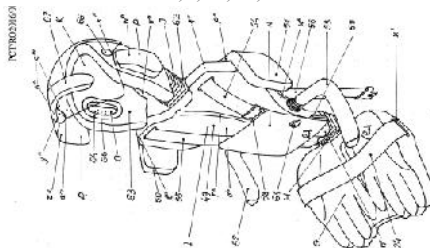
**Patent**

Patent no.RO 112986 B1; PCT/RO 2016/000021; WO 2017/014661

**Description**

The invention relates to a chair that can be used in a dwelling, in a means of transportation for persons or any other situation that involves a seated position, as well as when it is necessary to protect an occupant of means of transport and also for strengthen the back and neck muscles, to provide the spine curvature correction and for relaxation and rest, as well as for moving and positioning the sick people in bed, even those immobilized. Seated human diseases are not inevitable. Wrong form chairs on which we stand ill and shortens our lives. Near the chair occupant's body must be friendlier and more protective. To provide comfort, relaxation and mobility while working, traveling or lunch. It is not normal that after a long journey in any current means of transport to hurt feet. The correct way and complete bearing and support of the head with flexibility invented controlled chair offers unexpected possibilities for use in all areas and even in the medical field. Shape and color appearance chairs must meet the requirements and subconscious values of comfort, health and safety, so as to determine an irresistible impulse to sit down. It is time for a major change in design chairs true that our invention proposes. We invented proper contact with the occupant. We invented forms and new parts for chairs and we remove parts useless. All the planet's inhabitants who sit on various chairs, all without exception, they cause trouble and shortens their lives. Recent research has established that an hour sitting on a chair twice the current is more dangerous than smoking a cigarette!

4.5,8,12,13,14



NATIONAL

**RO.328.****Title** SALLAS universal pillow**Authors** Sălan Gheorghe**Patent** Patent application A/00175 2019

At all current cushions, even if are called improperly universal, the resulting head pressure on cushion is a vertical upward force with the point of application below the center of gravity of the head so that the head imbalance is maintained. Therefore the balance of the head must be permanently maintained by several pairs of neck muscles that can no longer relax properly. Hence the inconvenience, numbness and headaches, neck and shoulders that we often experience when we get up. At the truly universal sallas pillow, the vertical result of head pressure on the pillow is replaced by two lateral inclined forces, whose result is always vertical from bottom to top but this time the application point of this resultant force is above the center of gravity of the head. In this way the balance and stability of the head are ensured and so all the neck muscles can relax at will. Thus permanently disappear the discomfort, numbness and headaches, neck and shoulders due to the unstable balance of the head. So SALLAS pillows change your life. It is known that in order to support the correct position of cervical spine along the thoracic column we need a pillow up to ten times higher when we sleep on one side , to the same pillow when we sleep on our back or stomach. These are the most used positions for sleeping. During sleep, intermediate positions such as those on one side may also occur during sleep. Also intermediate positions may also occur during sleep such as being turned on a partial side. It follows that a sleazy sleep requires a variety of pillow-hem, which can not be secured by the actual pillows.

**Description**



**Laurentiu Dumitru BREAZ****RO.329.**

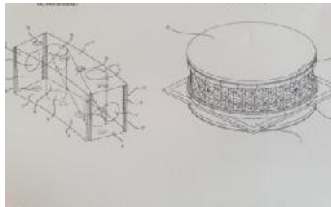
**Title** **MODULAR ELEMENT FOR STORAGE BASIN CONSTRUCTION, SUPPORTING STRUCTURE, METHOD OF CONSTRUCTION THEREOF**

**Authors** Breaz Laurentiu Dumitru

**Patent** WO2014/084748 / Patent application No. US 9,856,066 B2

The invention relates to modular elements for building a storage basin, to a network obtained by assembling a plurality of modular elements, to a supporting structure, to a storage basin and to a process for obtaining a storage basin. The modular element according to the invention is provided in the interior with a network element constituted by main half joint(10), secondary half joint(11) and tertiary half joint(10), vertical channels(8,15), oblique channels(9), compartments(18), and is provided with joint elements(16,17). The network comprises horizontal annular channels and main, secondary and tertiary joints connected by vertical and oblique channels. The storage basin comprises a supporting structure at the interior of an insulating structure obtained by assembling the modular elements. The process for obtaining a storage basin comprises the assembling of the modular elements and casting the hardening material in the network obtained by assembling the modular elements, forming the supporting structure.

B65D 81/38



**Filip PANAIT**

**RO.330.**

**Title**

**Pedicle surgical compress with passive pump systems for modulated unidirectional transfer of wound fluids**

**Authors**

**Panait Filip**

**Patent**

**BOPI, Nr.10/2013/A00248/2013**

**Description**

Invention describes a surgical compress whose structure contains several pedicles provided with systems of passive pumps for modulated unidirectional transfer of wound *fluids*. The pediculate surgical compress behaves as a biomembrane which replaces, for a while, the functions of undamaged tissue and allows regeneration mechanisms to act quickly and effectively to heal the wound.

Modulating the fluids' transport from the wound, together with the thermal barrier made of insulating layers of the surgical compress, generates an increase of local temperature over 37 Celsius degrees necessary for stimulating the enzymatic reactions and increasing the keratocytes.

**Class**

**4. Medicine-Healthcare-Cosmetics**

## Nicu Ion PUIU

**RO.331.**

**Title EN** Muscle Recovery device

**Authors** Nicu Ion Puiu

**Patent no.** Pending A121/2011

**Description  
EN**

**This device releases the muscular mass by creating a state of comfort and wellbeing, improving blood circulation and strengthening the muscle fibres. The device uses double way circulation tension of 220v or 12v and is also portable.**

**Class no.**

4



**RO.332.**

**Title EN** Module for ankle recovery

**Authors** Nicu Ion Puiu

**Patent no.** Pending A118/2012

**Description  
EN**

**The device for recovering ankle mobility stands out for its high performances, its ease of handling and is simple to adjustment thus enabling an easy recovery .**

**The movement is circular of 360° , the time is variable, the height of the pedal is adjustable.**

**Class no.**

4





**We want to raise creative children that are prepared for life, ready to create the future of the world.**

**Paradis International School** aims to develop in a harmonious manner children's personality, acting on all educational sides, considering the model of multiple intelligences and adjusting the educational project to the requirements of the modern society, creating a stimulating environment that is favourable to creativity /live learning – for all those involved in the educational process and also meeting the parents' expectations regarding the academic training of the child and his or her training for real life.

**Paradis Secondary School, Iasi**  
- *Model of creative school* -

RO.333.

<b>Title</b>	<b>Diamond Dust Perfume</b>
<b>Authors</b>	Chelaru Ana-Maria
<b>Institution</b>	<b>Paradis Secondary School, Iasi</b> Diamond Dust Perfume Successful stories start with “once upon a time, there was...” and remain on the peaks of success with “is” and “now”. As a magic result of a Diamond Year, Diamond Dust by Paradis combines the energy of the finest flowers and it is the own brand of inspiration for innovation. With rose wood as its main note, Diamond Dust encompasses in a harmonic manner its middle notes as well: jasmine, “God’s gift”, is a perfumed symbol of love and elegance, completed by the nobility of magnolia- symbol of perseverance and love for nature. The highest vibration, the most fragrant note which crowns the sweet floral aromas is the rose- the flower of love, purity and profound commitment.
<b>Description</b>	Diamond Dust by Paradis is a story about harmony, commitment, perseverance and love, it’s energy and vibration taken to the highest peaks. Because the stories are happening “now”, Diamond Dust is inspiration for innovation! Content: Materials: Damas rose essence, lemon, Sabac jasmine, magnolia, rosewood, ethylic alcohol. (>95%). In a bottle, the following essences are poured in order: 2 drops of Damas rose, 3 drops of lemon, 4 drops of Jasmine, 3 drops of magnolia and 3 drops of rosewood. They are shaken, and 20 ml of ethanol are added (according to the concentration, the volume can be minimized). The content is shaken energetically after the alcohol is added. The mixture obtained is stored in a dark colored bottle and is left there at least one week, shaken a few times. If it is necessary, at the end, the product can be filtered. It is a 100% BIO product.
<b>Class</b>	14

**RO.334.**

**Title** The Parts of the Human Brain

**Authors** Chelaru Ana-Maria

**Institution** Paradis International School Iasi

The model is made on a polystyrene board on which 5 series circuits are created for each representative part of the human brain. Each circuit has its own switch and they light separately regarding the part one wants to emphasize.

**Description**



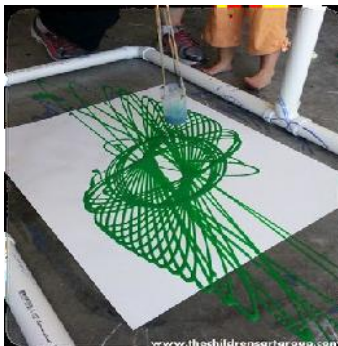
**RO.335.**

**Title** Focault's Pendulum and the Painters of the 3<sup>rd</sup> millenium

**Authors** Veronica Irimescu

**Institution** Paradis International School Iasi

**Description** The proof of the fact that planet Earth makes a rotational movement around its own ax.



**RO.336.**

**Title** Constellation Map  
**Authors** Irimescu Veronica  
**Institution** Paradis International School Iasi  
**Description** Creating a map of the sky with didactic purposes



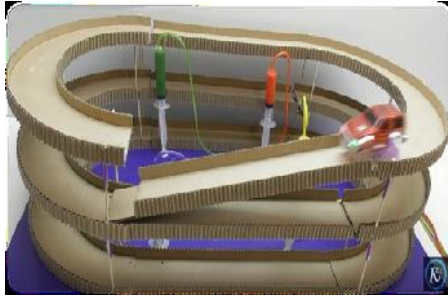
**RO.337.**

**Title** EggBot  
**Authors** Irimescu Veronica  
**Institution** Paradis International School Iasi  
**Description** Creating a mecanism which helps painting the Easter eggs.



**RO.338.**

**Title** A carting runway with access points for superior levels  
**Authors** Irimescu Veronica  
**Institution** Paradis International School Iasi  
**Description** Using the hidraulic pressure to create access points.



**RO.339.**

**Title** Earthquake – Model of strong constructions

**Authors** Joacă-Bine Dana

**Institution** Paradis International School Iasi

**Description**

The experiment consists of creating two almost identical buildings, having the same materials, the same height and the same dimensions. The difference between the two is that one building was made with a silencer. In case of earthquake, they retrieve the shock, and the earthquake is not felt in the same way. The silencers are placed in parallel, on levels and diagonally on each level in order to have a better strength. They were build from plastic-glass and were introduced in a polystyrene board in order to have the same base.

In order to simulate the earthquake, the polystyrene board will be shaken and the two buildings start swinging. The difference between the two buildings will be very clear.





**RO.340.****Title** Electric Shoe**Authors** Joacă-Bine Dana**Institution** Paradise International School Iasi**Description**

Because we desire to save our planet, we thought of saving electric energy. The ones who consume energy are us, people, but we are also the ones producing the most energy. In this way, while you play with your friends, walk the dog in the park, wearing the shoes of the future will help you reduce pollution because you won't use the means of transport and you will be the one producing electricity. The shoe of the future can charge, in our case, the mobile phone. It has got 6 piezoelectric pieces applied on its sole. The 6 formed 2 pairs. Each pair is connected in series, and the two pairs are tied in parallel. They were connected to a diode deck and a condensator, and they were connected to a charger. When you walk, they charge. Because until now we could only have 3,6 volts, we connected everything to a tension regulator and we connected a switch. Now the show offers 5 volts, exactly the amount we need to charge our phone. We mention the fact that at this moment the electric current works only in one direction, so the phone can charge only when the current goes in one direction, so the phone can charge only if you walk.

**RO.341.****Title** The City of the Future**Authors** Zofotă Monica**Institution** Paradis International School Iasi**Description**

During the third edition of the Nikola Tesla Interactive Science Festival, The Superheroes (class II B) proved their creativity, rich imagination and spirit of adventure in order to create models- The City of the Future.





## **PALATUL COPILOR**

B-dul Carol I, nr. 2 Iași  
ROMANIA  
Tel/Fax: +40.232.410802

### **THE PALACE OF CHILDREN, IAȘI**

"The Palace of children is an educational institution which deals specific instructive- educational activities outside school classes, where children complete their knowledge and go thoroughly into some domains, develop skills according to their calling and options and where their spare time may be organized in educational programs. These free activities may be attended, according to their own choice by children under the school-age, elementary school children, middle school, vocational school and high school students as well as children coming from orphanages, irrespective of nationality, sex and religion, according to their interest, skills and preferences." (Excerpt from the Regulations of organisation and functioning of Clubs and Palaces of Children)

Founded in 1953 under the denomination of the House of Pioneers with only seven clubs, the present Palace of Children has undergone dramatic changes as far as the number of clubs and their diversity is concerned.

Nowadays the Palace of Children functions with sixty clubs focused on cultural, artistic, technical, practical, scientific, sportive and touristic domains. They appeal to the 76.154 children in kindergardens, elementary schools, middle schools, vocational schools and high schools in Iași.

The institution owns the apparatus and materials necessary for the good working of the clubs. At present, the Palace of Children has connections with similar institutions in 12 countries on 3 continents.



## **PALATUL COPIILOR**

B-dul Carol I, nr. 2 Iasi  
ROMANIA  
Tel/Fax: +40.232.410802

### **PALATUL COPIILOR, IAȘI**

"Palatul Copiilor este o instituție de învățământ în care se desfășoară activități instructiv-educative specifice, în afara cursurilor școlare, prin care se aprofundează și se completează cunoștințe, se dezvoltă aptitudini potrivit vocației și opțiunilor copiilor, se organizează petrecerea timpului liber prin programe educative.

La activități pot participa în mod gratuit și la libera alegere, copii preșcolari și elevi din ciclul primar, gimnazial, profesional, liceal și din casele de copii, fara deosebire de naționalitate, sex și religie, corespunzător intereselor, aptitudinilor și preferințelor lor."

(Extras din Regulamentul de organizare și funcționare a cluburilor și palatelor copiilor)

Înființat în anul 1953, sub denumirea de Casa Pionierilor, având un număr de 7 cercuri, actualul Palat al Copiilor a cunoscut o dinamică puternică în ceea ce privește numărul de cercuri și diversitatea lor.

În prezent la Palatul Copiilor funcționează un număr de 60 de cercuri cu profile din domeniile cultural-artistice, tehnico-științifice, tehnico-aplicative și sportiv-turistice. Acestea se adresează celor 76,154 de copii din grădinițe, școli primare, gimnaziale, profesionale și liceale din municipiul Iași.

Activitățile sunt conduse de o echipă de cadre didactice calificată și specializată pentru activitățile de timp liber, formată din profesori, ingineri, maiștri coregrafi și antrenori.

Unitatea este dotată cu aparatură și materialele necesare unei bune desfășurări a activității specifice din cercuri. În prezent, Palatul Copiilor întreține legături cu unități de profil similar din 12 țări, de pe 3 continente.

## THE PALACE OF CHILDREN, IAȘI

### 1. PROTOTIP BRAT ROBOTIC

Bejenaru Ștefan cl a X a  
Gheorghită Sebastian cl a X a  
Popescu Irina cl a VII a  
Prof.dr.Colbu Gheorghe  
Prof. R.Pantelimonescu

### 2. AUTOMAT SONERIE ȘCOLARĂ

Josanu Rareș Ionuț cl a XI a  
Motoc Saranda cl aXII a  
Prof. R.Pantelimonescu  
Prof. Ursache Mihaela

### 3. LOCUINȚE =ECO=

Comșa Karina cl a II-a  
Prof.dr.Colbu Gheorghe

### 4. COMPLEX SPORTIV PENTRU ANTRENAMENTE

Popescu Irina cl. a VII a  
Artene Andrei cl. a X a  
Prof.dr.Colbu Gheorghe  
Prof. Ursachi Mihaela

### 5. AEROMODEL ELECTRIC

Comșa Kevin cl. a IV a  
Prof. Matei Doru

6. NAVA ECOLOGICA

Ciobanu Ștefan cl. a V a  
Mătășaru Alexandru cl. a IV a  
Ungureanu Alexia cl. a VII a  
Prof. Stratulat Mihai  
Pof. Sandu Carmen

7. HÂRTIA PLANTABILĂ

Alexandra Manea cl. a IX a  
Ana Maria Ursărescu cl. a IX a  
Prof. dr. Gabriela Andrei

8. ECONOMIA-DE LA IDEE LA AFACERE

Crina Constandache cl. a XI a  
Ipate Alexandra cl. a XI a  
Prof. dr. Gabriela Andrei

9. IMPRIMANTA 3D.

Stamate Rareș Constantin cl. a VI a  
Prof. Chiriță Daniel

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10. COMPOZIȚII

Bîrleanu Ioana cl. a VIIa  
Colbu Teodora cl. - I a  
Timofte Mihaela cl. a XI a

Prof. Colbu Eugen Liceul „O. Doamna” Suceava

11. COMPOZIȚII

Anton Ana-Maria cl. a VI a  
Panțiru Iustina cl. a VII a  
Grosu Ștefania cl. a V a

Prof.dr. Toma Mădălina Palatul Copiilor Iași

12. COMPOZIȚII

Comșa Karina cl a II a  
Popescu Irina cl. a VIIa  
Artene Andrei cl. a X a  
Motoc Saranda cl. a XII a

Prof.dr. Colbu Gheorghe Palatul Copiilor Iași

\*\*\*

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### **1. DRIVE “J.R.” MAȘINA INTELIGENTĂ**

Josanu Rareș Ionuț      cl a XI a

Prof. Pantelimonescu Remus, ing. dr. Iov Cătălin

### **2. ROBOȚI AUTONOMI DE COMPETIȚIE**

Lucrări realizate de elevii:

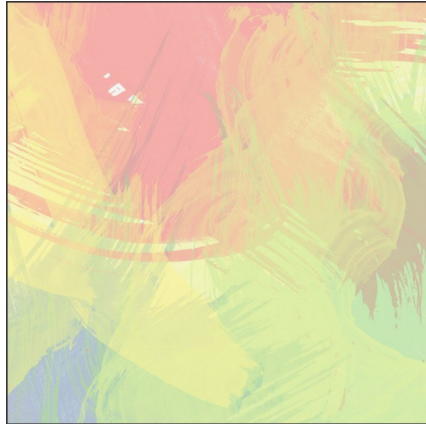
Josanu Rareș, Szabo Tiberiu, Popa Bogdan, Platon Alexis,

Bejenaru Ștefan, Pandeia Mircea, Gheorghică Sebastian

Prof. R. Pantelimonescu, ing. dr. Iov Cătălin

# EUROINVENT

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10-17 May 2019

with special help of:  
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Universitatea Națională de Arte  
George Enescu  
Iasi



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Simion Cristea, Adrian Crișmaru, Bogdan Gavrilcan, Florin Grigoraș,  
Miruna Hașegan, Cristina Hirțescu, Modesta Lupascu, Ecaterina Marghidian,  
Bogdan Maximovici, Cristian Neagoie, Ioana Palamar, Mihai Pamfil,  
Florin Pînzariu, Monica Pop, Tiberiu Pop, Ioan Pricop, Sorin Purcaru,  
Valentin Sava, Atena-Elena Simionescu, Magda Sficlea, Mircea Ștefănescu,  
Cristea Simion, Cristina Stratulat, Adrian Stoleriu, Andreea Stoleriu, Liviu Suhar,  
Mihai Tarasi, Constantin Tofan, Cristian Ungureanu, Mădălina Vieriu, Tiberiu Vlad

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Vernisaj și Premierea:  
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**Curators:**

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# EUROINVENT

## VISUAL ART EXHIBITION

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2. Gabriela Benescu
3. Zamfira Bîrzu
4. Bianca Boroş
5. Ilie Bostan
6. Smaranda Bostan
7. Cornelia Brustureanu
8. Cezarina Caloian
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19. Ioana Palamar
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## VISUAL ART EXHIBITION

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22. Monica Pop
23. Tiberiu Pop
24. Ioan Pricop
25. Sorin Purcaru
26. Valentin Sava
27. Atena-Elena Simionescu
28. Magda Sficlea
29. Mircea Ștefanescu
30. Cristea Simion
31. Cristina Stratulat
32. Adrian Stoleriu
33. Andreea Stoleriu
34. Liviu Suhar
35. Mihai Tarasi
36. Constantin Tofan
37. Cristian Ungureanu
38. Mădălina Vieriu
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**TECHNICAL-SCIENTIFICAL, ARTISTIC AND  
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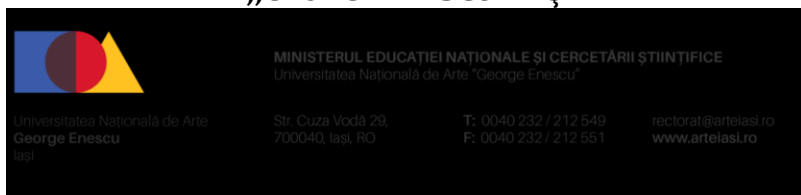
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Această sărbătoare a științei, tehnicii și artei românești, organizată sub sigla „Zilele Europei la Iași”, se desfășoară prin implicarea tuturor actorilor și vectorilor sociali: studenți, cadre didactice universitare, cercetători, artiști, mass media, mediul de afaceri, autorități etc. Un aport deosebit în aceste manifestări îl au cele cinci universități de prestigiu ale Iașului, care s-au remarcat prin performanță și tradiție de-a lungul istoriei lor, fiind recunoscute atât în țară, cât și în străinătate ca principalii formatori de inteligență românească și surse veridice ale cercetării fundamentale și tehnologice performante.

Implicarea celor cinci universități în toate edițiile de până acum a condus la formarea și dezvoltarea de lideri ai creativității în domeniile lor de specializare.

Prin aceste manifestări se dorește o participare activă, printr-o bună conlucrare și dialog între inventatori, studenți, specialiști din diverse domenii, artiști, mediul academic și cel industrial.

EUROINVENT înseamnă un eveniment complex alcătuit din: Salonul European de Invenții și Cercetare Științifică, Salonul de Carte și Salonul de Artă, un rol important avându-l Workshop-ul organizat sub sigla „Cercetarea tehnico-științifică în contextul contemporan european”, unde se dezbate teme actuale de cercetare și aspecte moderne ale celor trei tipuri de proprietate: intelectuală, industrială și culturală, având în vedere printre altele, stimularea actului de creație și protecția dreptului de autor. În ultimii patru ani acest workshop s-a alăturat componentei principale a EUROINVENT-ului, cunoscut sub titlul: Conferința Internațională de Cercetări Inovative (ICIR – International Conference for Innovative Research).

Cu ocazia zilelor dedicate inventatorilor sau instituțiilor de cercetare și de învățământ din țările participante la această manifestare, se vor prezenta sistemele actuale de transfer tehnologic, dinamica brevetării și alte aspecte privind ingineria creativității, respectiv rezultatele deosebite obținute de către școlile de inventică în formarea tinerilor.

La actuala ediție, vizitatorii celor trei saloane vor putea vota invențiile, temele de cercetare, cărțile și operele de artă pe care le consideră meritorii. Cele mai apreciate vor recompensate cu un premiu de popularitate din partea publicului.

Volumul de față cuprinde un număr de 18 lucrări, selectate de un grup de referenți, în acord cu direcțiile de cercetare din învățământul superior ieșean și evenimentele care vor fi marcate la a 11-a ediție a EUROINVENT.

Sub genericul „Cercetarea românească în conext european”, lucrările au fost grupate pe următoarele secțiuni: Știința Conservării Bunurilor de Patrimoniu Cultural și Natural, Științe Conexe, Inventică și Istoria Neamului Românesc. Au fost acceptate lucrări în limba română și engleză, cu o bibliografie recentă și selectivă.

Prof.univ.emerit dr. Ion SANDU,  
Președinte de Onoare al Forumului Inventatorilor Români

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Ana DROB, *Aspectele teoretice ale analizei a artefactelor vechi din ceramică*

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# **EUROINVENT ICIR 2019**

## **International Conference on Innovative Research**

**May 16<sup>th</sup> to 17<sup>th</sup>, 2019**

Iasi – Romania

Palace of Culture

**Organized by:**

- ▲ **Romanian Inventors Forum**
- ▲ **Faculty of Materials Science and Engineering, The “Gheorghe Asachi” Technical University of Iasi, Romania**
- ▲ **ARHEOINVEST Platform, Alexandru Ioan Cuza University of Iasi**
- ▲ **Centre of Excellence Geopolymer and Green Technology CEGeoGTech), Universiti Malaysia Perlis (UniMAP)**

**With support of:**

- ▲ **International Federation of Inventors' Associations - IFIA**
- ▲ **World Invention Intellectual Property Associations – WIIPA**

**Editors:**

**Andrei Victor SANDU, Mohd Mustafa Al Bakri ABDULLAH,  
Petrică VIZUREANU, Che Mohd Ruzaidi GHAZALI, Ion SANDU**



**International Conference on Innovative Research ICIR** is a part of **EUROINVENT**, a complex event which brings together contributions of consecrated schools from higher education, academic research and also of individual researchers and inventors.

During the Conference leading researchers, engineers and scientists will present actual research issues in the field of Materials Science and Engineering.

All accepted papers from EUROINVENT 2019 International Conference on Innovative Research will be published in:

– **IOP Conference Series: Materials Science and Engineering** (Indexed by SCOPUS and WEB OF SCIENCE)

– **European Journal of Materials Science and Engineering** (indexed by DOAJ and Chemical Abstracts)

which covers the entire range of basic and applied aspects of the synthesis and characterization, modeling, processing and application of advanced engineering materials.

The Book of Abstracts of the Conference has the following ISSN: P 2601-4580 & L 2601-4599.

Topics of interest for submission include, but are not limited to: Synthesis and characterization of materials; Processing and applications of materials; Procedures and technologies for material processing; Materials & Life Science

The ICIR 2015 Conference Proceedings have been published in **KEY ENGINEERING MATERIALS** (volume 660) and indexed by SCOPUS.

The ICIR 2016, 2017 and 2018 Conference Proceedings have been published in **IOP Conference Series: Materials Science and Engineering** – Volume 133, Volume 209 and respectively Volume 374 – indexed by Web of Science – Thomson Reuters and SCOPUS.



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**Keynote Speaker – Mihaly REGER**

**Invited Speaker – Mohammad FIRDAUS ABU HASHIM**

**Invited Speaker – Rodica Mariana ION**

**Invited Speaker – Brândușa GHIBAN**

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**281 foreign registrations from 41 States**



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**358 registrations from Romania**

# *“Gheorghe Asachi” Technical University of Iasi Technological Transfer Center “POLYTECH”*



## **I. Services provided by Technological Transfer Center (TTC)**

### **POLYTECH:**

The **Technological Transfer Center POLYTECH** manages and monitoring activities for projects/contracts that carry out research/development, innovation, technology transfer, design, consulting, expertise and service within the Technical University “Gheorghe Asachi from IASI”.

Within the TTC, research projects are being carried out in collaboration with the UEFISCDI Contracting Authority, projects financed by the State Budget, contracts under the Sectorial Plans, contracts with European funds and contracts with parts of the industrial and private sector, financed from own resources.

### **1) Business consulting**

- a) Identification of the technological transfer needs by establishing a database of technical problems of the companies, facilitating the connection with the Centers and Research teams from TUIasi Research, Innovation and Technological Infrastructure;
- b) Identification of potential partners from public and private environments, establishment of a Platform of Partner search, for collaboration in long-term projects in national and European programs;

- c) Inventory of the results of the research projects carried out within TUIasi and finalized with technologies, patents, products, prototypes, experimental models - included in the Register established according to the law;
- d) Evaluation and selection of technologies with potential for capitalization through technology transfer and promotion to economic agents;
- e) Achievement of the portfolio of services offered to economic agents: evaluation, expertise, technological audit, technology watch, reports, analyses and forecasting studies, technical information, technical consultancy, technology transfer advice, innovation potential assessment, assistance in purchasing products and services specific domains of activity;
- f) Providing specialized assistance for the restructuring, upgrading and modernization of SMEs;
- g) Providing technical and legal support to economic entities that acquire patents and facilitating communication with authors of inventions;
- h) Carrying out studies and market research, feasibility studies and business plans;
- i) Organization of technological demonstration activities on request, and identification of funding schemes for the application of the research results to the beneficiary economic agent;
- j) Legal, logistical and financial counselling of TUIasi employees' researchers with regard to companies initiation (spin-off and start-up companies) based on research results, according to the law and specific funding programs;
- k) Informing the economic agents regarding the participation in economic missions or national or European brokerage events;
- l) Initiating and carrying out projects in the field of innovation, technology transfer and development of its own infrastructure.

## **2) Intellectual property**

- a) Provide support for the technical examination of innovative ideas in order to determining their applicability, comparison with the current state of the subject and correspondence with the technical requirements laid down in the intellectual property law;
- b) Provide support for the elaboration of patent applications according to the national and international legislation in force, in order to protect innovation;
- c) To carry out all legal steps regarding the transmission of patent applications, communication and payments during the registration, examination and maintenance of patents;
- d) Ensure the assessment of intellectual property to establish the predictable economic value of the innovative idea;

- e) Elaboration of documentation necessary for the technological transfer: confidential clauses, license agreements, signed declarations, obligations;
- f) Elaborating and reviewing procedures for the transfer of technology and knowledge to economic agents;
- g) Informing the academic community of TUIasi about the legislation governing the granting of intellectual property rights at national and international level;
- h) Provide technical assistance to economic agents, regarding the exploitation of intellectual property rights and to achieve the technological transfer of RDI results, with direct effects on increasing economic competitiveness and the number of jobs.

### **3) Promotion and training**

- a) Organizing workshops for TUIasi, the local, regional community and industrial partners in order to raise awareness about the specific issues of innovation and technological transfer;
- b) Organization of the training and development of the innovative culture of the industrial partners, especially SMEs, through seminars, courses, publishing of promotional and informative materials, scientific manifestations, and technological brokerage;
- c) Organizing training sessions in the field of internal and international law on intellectual property issues;
- d) Developing curricula for competence building on innovation, innovation management and entrepreneurship;
- e) Increase the visibility of TUIasi patents by posting them on the TTC POLYTECH website, including information on the technology transfer potential;
- f) Carrying out campaigns to promote the offer of products/technologies/services at local, regional, national and international level;
- g) Organizing specific actions to promote the results of RDI activities carried out within TUIasi (business meetings, presentation stands, participation in fairs and domestic and international exhibitions).

## **II. Analyses of the technology transfer needs of the companies highlighted the following issues, which TTC will consider in its future work:**

- 1) The members of the companies trust the Romanian research and support their application in the Romanian industry, in order to increase the economic competitiveness;
- 2) There is a fairly high percentage of companies that are not interested in organizing/supporting events promoting Romanian research results, which



can bring to the attention of the business environment those results with great applicability potential;

- 3) Most businesses are not informed about national and EU RDI policies, nor about national or European programs that fund R & D projects;
- 4) There is a high degree of confidence that their competitiveness through TTE (Technology Transfer Entity) can increase;
- 5) The need for adequate fiscal policies to facilitate innovation and technological transfer;
- 6) Easier access to specific information infrastructure on TTE (research results databases, existing RDI organizations, available funding projects and programs, etc);
- 7) Providing TTEs with assistance to companies to become more innovative by applying/capitalizing on RDI results in their activities;
- 8) Encouraging partnerships between research/university and the economic environment by addressing research from an entrepreneurial perspective.

### **III. The main benefits that TTC can bring to:**

#### **A) Universities/Research Centers**

- 1) Auxiliary funding sources for future R & D activities;
- 2) Long-term financial sustainability of research activities;
- 3) Verifying the results of the research in practical situations;
- 4) Getting new sources of information, contacts and incentives for future research;
- 5) Greater credibility and visibility of these organizations.

#### **B) Industry/Economic environment**

- 1) Access to unique research results;
- 2) A shorter innovation cycle for new products;
- 3) Obtaining competitive advantages;
- 4) Get research results transferred to products that depend on the use of special research infrastructures, capabilities and knowledge.

#### **C) Society as a whole**

- 1) Increased funding for education and research;
- 2) Standards and high quality of life;
- 3) To concentrate in the region some valuable knowledge and finance;
- 4) Greater attractiveness and competitiveness of the region.

