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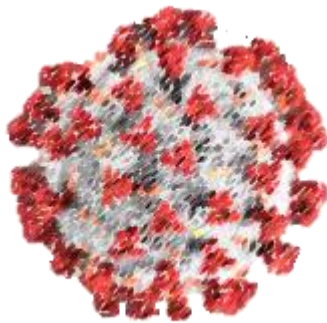
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Romanian Inventors Forum / Forumul Inventatorilor Romani

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**FIGHT AGAINST
VIRUSES AND
TRANSMISSIBLE DISEASES**



Coronavirus Disease 2019 (COVID-19)

How to protect yourself and others from infection



Follow these good practices



Always wash your hands with soap and running water when hands are visibly dirty. If your hands are not visibly dirty you can use an alcohol-based hand rub or soap and water.



Contact your nearest health care provider if you have fever and either cough or difficulty breathing, along with a history of travelling to one of the epidemic countries.



Cover your mouth and nose with disposable tissue when coughing or sneezing and dispose of tissue immediately after use.



Cough or sneeze into your upper sleeve or bended arm if a tissue is not available.

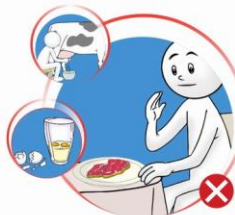
Things to avoid



Avoid close contact with people who have travelled from the areas experiencing an outbreak or those who show cold or flu-like symptoms.



Avoid direct unprotected contact with live farm or wild animals, as well as surfaces in contact with animals.



Avoid eating or drinking uncooked animal products, including raw meat, eggs and milk.



Avoid eating animals that have died of disease.





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 geodesists 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 13400 students in 61 engineering specializations, 73 *Master of Science* programs and a doctoral school with 13 domains.

Besides its educational mission, the *Gheorghe Asachi* Technical University of Iasi has an important research dimension, having many 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 194 of senior researchers, PhD supervisors and the enthusiasm brought by our more than 1000 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.



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 25,000 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. For many years, UAIC is placed on top in the national research ranking, having also several fields of research in top 500 Shanghai. 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 and an Institute of Multidisciplinary Research, 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 80 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 80 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 specialiști. 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 (UAIC) 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 25.000 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 many years, UAIC is placed on top in the national research ranking, having also several fields of research in top 500 Shanghai. 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 25.000 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 și prestigioase instituții de învățământ superior din România. UMF Iași face parte din Grupul celor 12 Universități de Cercetare Avansată și Educație. Toate programele de studii universitare de licență și masterat aparținând celor 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). Universitatea este membră a Agenției Universitare Francofone (AUF) și clasată în Top Shanghai 500, Times Higher Education, Top 25 U-Multirank. Peste 9,000 de studenți din peste 70 de țări studiază în cele patru facultăți ale universității , ceea ce face ca Universitatea de Medicină și Farmacie „Grigore T. Popa” din Iași să fie cea mai cosmopolită instituție de învățământ superior din sud-estul Europei. Reputația internațională de care se bucură UMF Iași este întărită și de prezența absolvenților Universității în renumite spitalele ale lumii, precum și în cele mai importante centre de cercetare. Raportul de evaluare 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.



GRIGORE T. POPA UNIVERSITY OF
MEDICINE AND PHARMACY IASI

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The „Grigore T. Popa” University of Medicine and Pharmacy of Iasi was founded in 1879 and is one of the oldest and most prestigious institutions of higher education in Romania. The University is proud to be part of the 12 Universities of Advanced Research and Education in our country. The four faculties - Faculty of Medicine, Faculty of Dental Medicine, 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 Conférence Internationale des Doyens et des Facultés de Médecine d'Expression Francaise (CIDMEF). The university is member of Agence Universitaire de la Francophonie (AUF) and high ranked in Top Shanghai 500, Times Higher Education, Top 25 U-Multirank. Over 9,000 students from over 70 countries around the world study in the four faculties of the University, which makes "Grigore T. Popa" University of Medicine and Pharmacy of Iasi the most cosmopolitan institution of higher education in south-eastern Europe. The University's international reputation is also sustained by the presence of the graduates in important hospitals in the world and even in the most important research centers. The 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
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pentru Protecția Mediului

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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.

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- ▲ **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)**

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- ▲ **World Invention Intellectual Property Associations – WIIPA**

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Romanian Inventors Forum &
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EUROINVENT INTERNATIONAL JURY (II)

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Aurelia LUPAN	AGEPI Moldova (R.Moldova)
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EXHIBITS CLASSIFICATION

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

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 edition of EUROINVENT sent invitations to inventors associations from many countries.. 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

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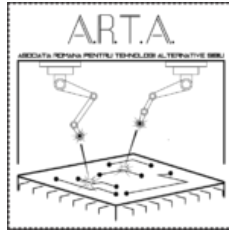
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Ce facem?

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

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.





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

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* premiu de 10.000 lei, oferit la Euroinvent

* recunoașterea adevăratelor valori naționale prin acordarea de premii de excelență pentru: Radu Beligan, Gabriella Ficș 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 Moisil, 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.

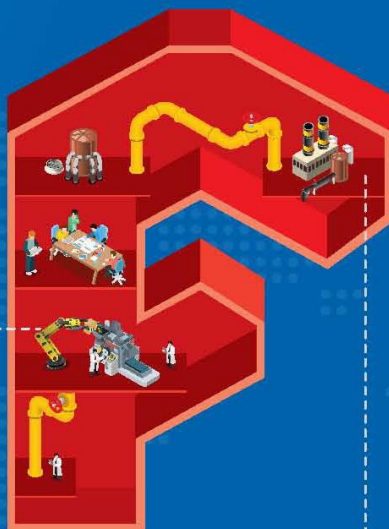
Investițiile în cercetare și inovare sunt esențiale pentru viitorul omenirii!

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.





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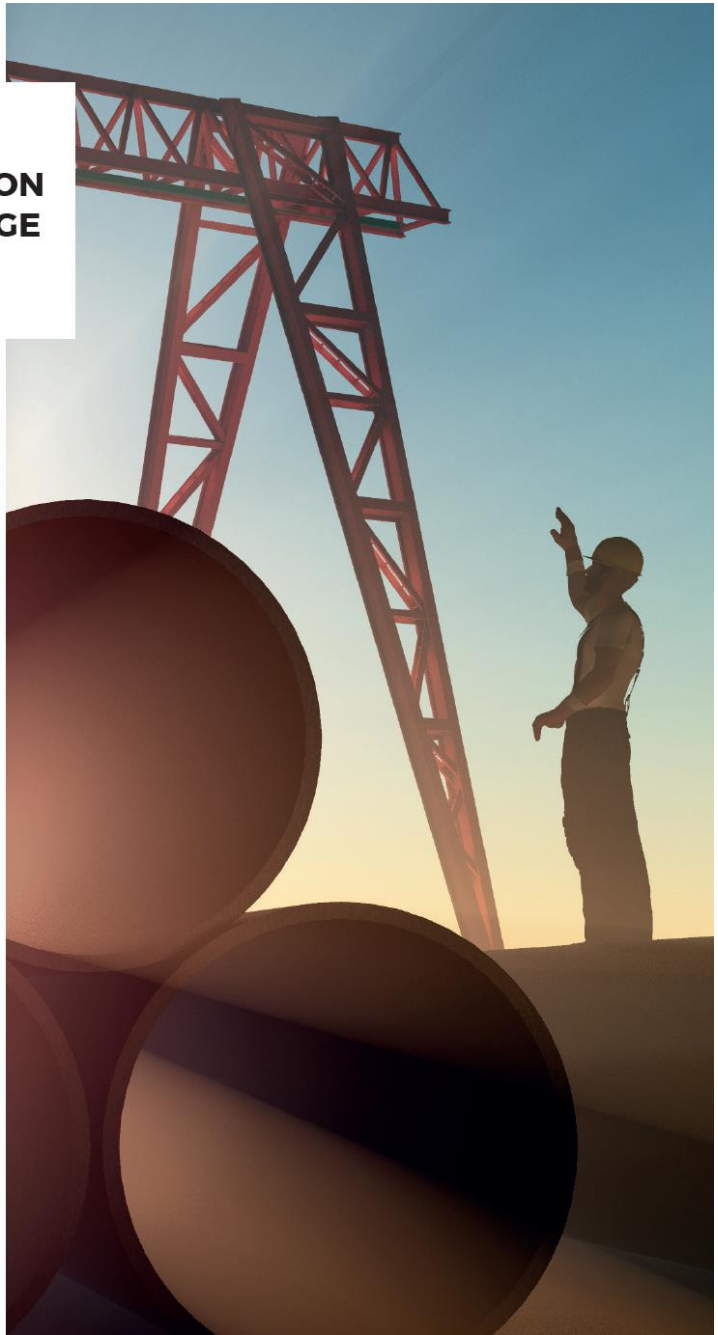
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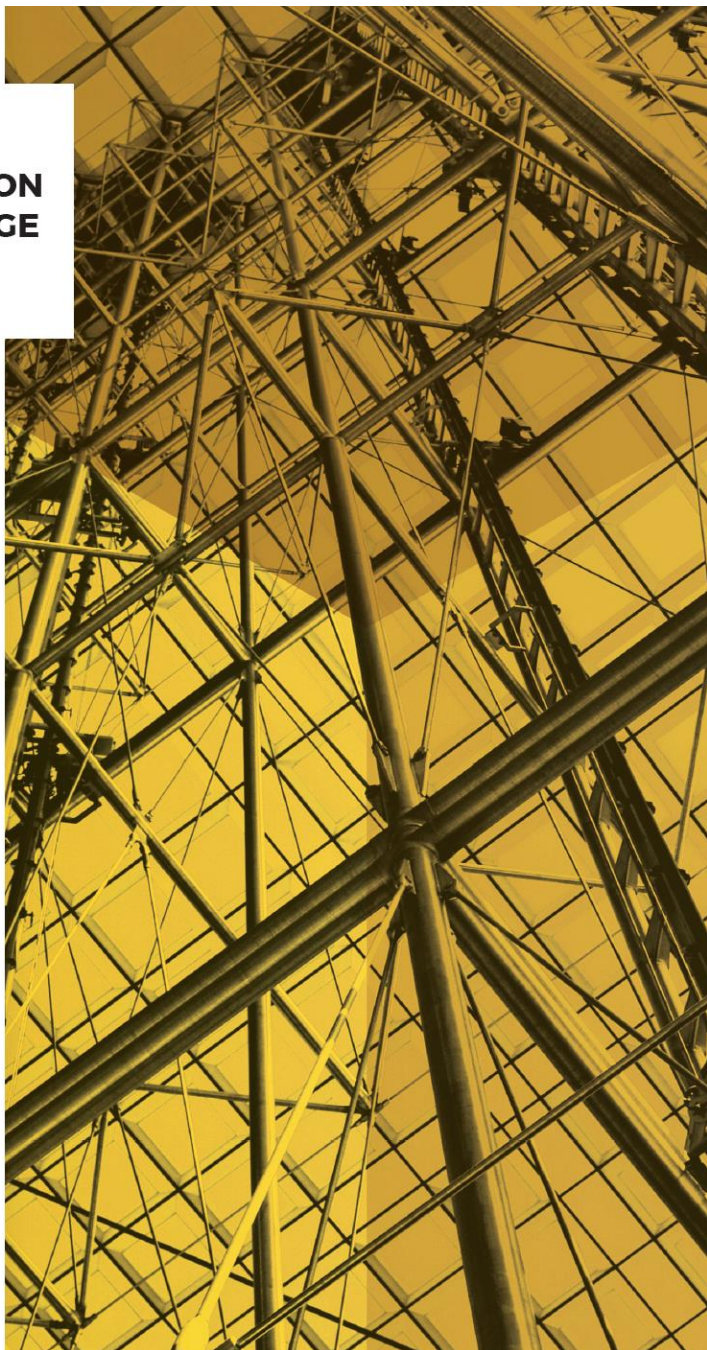
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HOFIGAL®

HOMEOPATIE - FITOTERAPIE - GALENICE

„Hofigal” este unul dintre cele mai faimoase nume de marca pentru produsele homeopate, gemoderivate si fitoterapice galenice din România, conditionate sub forma de medicamente, suplimente alimentare, produse cosmetice, ceaiuri.

„Hofigal” este o societate pe actiuni cu capital social privat exclusiv romanesc. Suprafata utila a companiei este de 35 hectare.

In intreaga companie lucreaza aproximativ 400 angajati, fiind permanent motivati spre o perfectionare profesionala si personala continua; acestia isi desfasoara activitatea acoperind domenii diverse: *Agricultura, Planificarea Productiei, Productie, Aprovizionare, Logistica si Distributie, Vanzari, Marketing, Terapii Noi, Managementul Calitatii Totale, Controlul Calitatii, Relatii cu Autoritatile, Cercetare & Dezvoltare, Resurse Umane, Juridic, Administrativ, Intretinere, I.T.*- toti alcatuind un sistem.

„Hofigal Export Import” S.A. este o companie specializata in fabricatia produselor exclusiv naturale, având caracteristic faptul ca își produce majoritatea materiilor prime folosite in serele si pe terenurile agricole proprii.

Materiile prime active folosite se obțin in condiții controlate, in cadrul unei agriculturi strict ecologice.

Diversitatea portofoliului si calitatea produselor impun „Hofigal” ca unul dintre cei mai puternici concurenți al unor firme, deja cu tradiție, din Franta, Italia si Elvetia.

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 „Extrakte 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 autorizați, 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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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.

Dimineăța 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.

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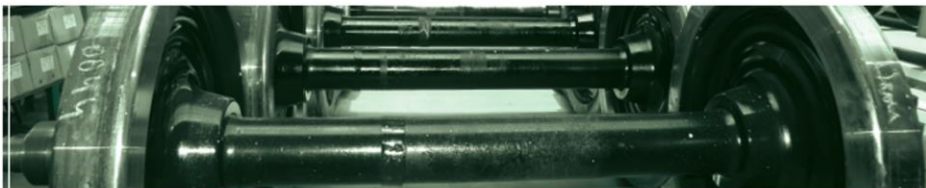


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Assemblies, subassemblies and services





With an experience of over 10 years, [ProtectMARK](#) is one of the most important Intellectual Property Company from the North-East region of Romania.

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.

Str. Petre Țuțea, nr. 5, Iași / Mobil: 0721 514264
office@protectmark.ro / www.protectmark.ro



Oficiul de Stat pentru Invenții și Mărci

Str. Ion Ghica Nr.5 Sector 3, București
Tel.021.3060800-29; Fax:021.312.38.19; office@osim.ro; 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, topografii 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; 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.

str. Andrei Doga 24, bloc 1

MD-2024, Chișinău, Republica Moldova

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E-mail: office@agepi.gov.md URL: www.agepi.gov.md www.facebook.com/AGEPI/

The State Agency on Intellectual Property of the Republic of Moldova (AGEPI) is an administrative central authority 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) in the territory of the Republic of Moldova:

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

AGEPI issues titles of protection for IP objects, provides information and legal advice about protection and enforcement of IP rights, publishes the Official Bulletin of Intellectual Property (BOPI), promotes and propagates intellectual property, organizes the attestation of patent attorneys, conducts trainings and professional development courses, provides IP pre-diagnosis and other related services.

Since 2015, it is possible to validate European patents in the Republic of Moldova through the European Patent Office (EPO). The single procedure for issuing European patents provides for simpler and more cost-effective protection of inventions in the EPO Member States but also in extension and validation states, including in the Republic of Moldova.

AGEPI services are provided according to the Quality Management System ISO 9001:2015, which ensures a quality according to international standards.

Agenția de Stat pentru Proprietatea Intelectuală a Republicii Moldova (AGEPI) este o autoritate administrativă centrală din subordinea Guvernului, responsabilă de promovarea și realizarea activităților în domeniul protecției juridice a proprietății intelectuale. Prin intermediul AGEPI vă puteți proteja eficient proprietatea intelectuală (PI) pe teritoriul Republicii Moldova:

- Invenții, soiuri de plante, topografii ale circuitelor integrate, mărci de produse și de servicii, desene și modele industriale, indicații geografice, denumiri de origine, specialități tradiționale garantate;
- Opere literare, artistice, științifice, programe pentru 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), promovează și popularizează proprietatea intelectuală, organizează atestarea mandatarilor autorizați, cursuri de instruire și perfecționare a specialiștilor în domeniu, acordă servicii de prediagnostică a PI și alte servicii aferente.

Din 2015 este posibilă validarea brevetelor europene pe teritoriul Republicii Moldova prin intermediul Oficiului European de Brevete (OEB). Procedura unică de eliberare a brevetelor europene asigură obținerea printr-o modalitate mai simplă și cu mai puține costuri a protecției invențiilor în statele membre ale OEB, dar și în statele în extindere și validare, inclusiv în Republica Moldova.

Serviciile AGEPI sunt prestate conform Sistemului de Management al Calității ISO 9001:2015, ceea ce garantează calitate în conformitate cu standardele internaționale.



World Invention Intellectual Property Associations

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.

OBJECTIVES:

The objectives of WIIPA are:

1. To encourage invention / creation development and protect the intellectual property of inventors or designers.
2. To promote and enhance the development and utilization of inventions and designs.
3. To secure cooperation and mutual assistance amongst international associations of inventors and designers.
4. To establish and carry on institutions of education, instruction or research and to provide for the experience of invention knowledge generally.
5. To promote cooperation amongst the associations of inventors, designers and persons who in different fields of interests and research work for invention, research and technology.
6. To improve the status of WIIPA inventors at international levels, and to promote cooperation between inventor associations worldwide.
7. Hold or assist in holding conferences, exhibitions, competitions and organize lectures for the purpose of promoting the objects of WIIPA.
8. To achieve the foregoing objectives with WIIPA members.

**ROMANIAN INVENTORS FORUM & EUROINVENT
is member of 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



Universiti Malaysia Perlis (UniMAP) is Malaysia's 17th 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 15,000 students and a workforce of more than 1,900 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.



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 & **Email:** 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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The "Genius" is the main theme of the magazine "Il Brevetto", the curiosity and passion for innovation are the values of an editorial staff that was born in the era of the digital revolution, in an unbridled technological context, with the specific aim of enhancing through patents the most brilliant minds, the discoveries, the startups and the business realities. An unpublished magazine in the publishing industry, a team of journalists who, in collaboration with scientists, engineers, computer scientists, lawyers, inventors, investors, aims to increase the world of information through innovation.

Patented systems, stories of young phenomena, in-depth studies of technology, scientific research, environmental sustainability, a futuristic path among the best ideas with brilliant minds. The magazine is a careful and documented selection of inventions from all over the world, in laboratories where you experiment, invent, discover formulas, design machines, create prototypes, objects and devices that aim to improve life.

The exclusive images of the prototypes, the words of the inventors, their potential, the stories of men and women who dedicate their lives to research, the collaborations with universities that give voice to young students exalting the results of research, which have become patented systems, the initiatives and events around the world, unique experiences to be documented.

RUBRICS

The Patent offers numerous sections,
with a competent and original approach to the issues dealt with:





The **paper** distribution of the magazine is part of the **main world events** dedicated to innovation for which the magazine is a Media Partner.

In addition, the printed version of the magazine is available at traditional **news-stands** for the Italian edition. In parallel with this distribution strategy, the magazine is delivered to users who subscribe to the **annual subscription**, free for the first issue.

NUMBER OF PAGES OF THE MAGAZINE 100 > 150
TIRACY NEWSSTAND 50.000
TIRACY INTERNATIONAL EVENTS 25.000
RECURRENCE MONTHLY
EXPECTED PUBLIC PRESS NUMBERS 100.000

The distribution of the magazine includes a rich selection dedicated to the **target influencers** (venture capitalists, tech and innovative influencers).

The **digital** version is periodically published in two editions: **Italian** and **international** (in English), respectively by **libretto.news** and **thepatent.news**. The digital magazine can be **downloaded** only after subscribing to the **annual subscription**. Moreover, on the website you can find daily news about inventions, scientific discoveries, prototypes and many other sections related to the world of innovation.

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NUMBER OF PAGES VISITED PER MONTH 30.000+
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WORLD EVENTS

Copies of the magazine will be distributed to the following national and international events:

ROMANIA Exhibition of creativity and innovation	KOREA International Invention Fair	SAN FRANCISCO Silicon Valley International Invention Festival	MILAN Innovagora
NORWAY IENA 2019	LAS VEGAS CES	DUBAI Global Grand Show	TORONTO iCan - International Invention
KIYO Invention Korea	GENEVA Invention Geneva	PARIS International Invention Innovation	HANNOVER Maker Faire
LOS ANGELES Electronic Entertainment Expo	ROME Maker Faire	KUWAIT International Invention Fair in the Middle East	PRAGUE Maker Faire

TARGET

The target audience of Il Brevetto on the one hand is made up of **enthusiasts** of the sector, those who are always looking for the **new**, who are not satisfied with general scientific journals, but seek the exact fulfillment of what **innovation** means.

On the other hand, it is aimed at makers in search of **visibility**, who intend to concretely enhance their **invention** through the **development** of the patent.

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PARTNER EVENTS



PARTNER EVENTS



International Invention Innovation Competition in Canada
ICAN-TORONTO, CANADA



PROINVENT

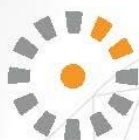


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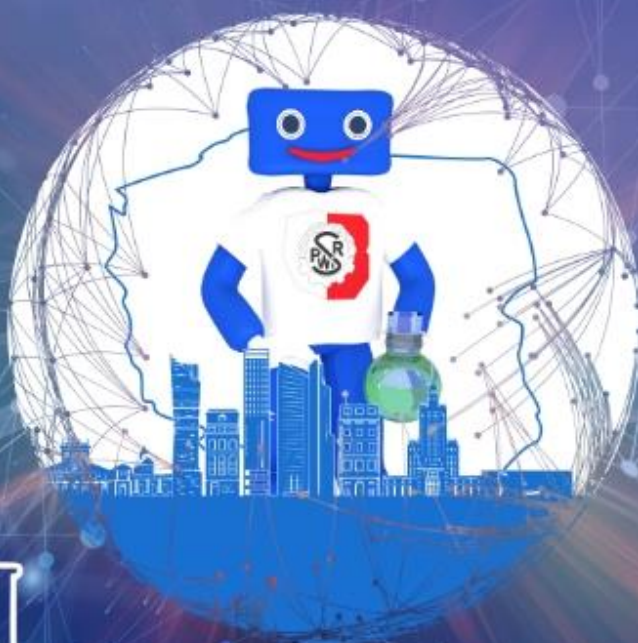
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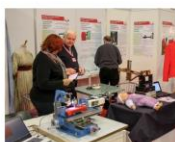


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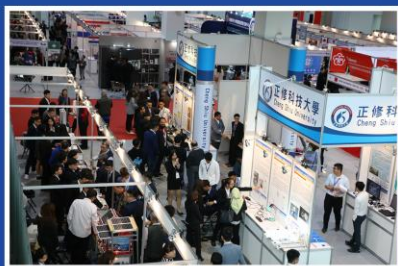


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2020 December 11~13

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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 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

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 Politehnică 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 în Optoelectronică - 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
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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

OBJECTIVE SPECIFIC:

- 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.

INTERNATIONAL EXHIBITORS

Bosnia and Herzegovina, Cambodia, Canada,
China, Croatia, Egypt, Hong Kong, India, Indonesia, Iran,
Japan, Korea, Macao, Macedonia, Malaysia, Morocco,
Moldova, Philippines, Poland, Russia, Singapore, Sri Lanka,
Sudan, Syria, Taiwan, Thailand, Turkey, Ukraine, United
States of America, United Kingdom, Vietnam

Bosnia and Herzegovina

BH.1.

Title

**INTEGRAL INFORMATION SISTEM FOR
PARAMETER MONITORING**

Authors

Branko Miladinovic, dip. Electrical eng.

Institution

“AUDIOTEX”

Patent no.

Multiple inovations in one sistem

Description

This electronic system is intended to controls and analiyes of parameters reliability in regionalnetworked activitties

Class

(8)



Cambodia

Norton University

KH.1.

Title	NU Chat Translation
Authors	Luy Mithona, Rachana Chhoeung, Ley Kamthong, Horn Kimheang
Institution	Norton University
Patent	Processing
Description	Chat Translation is a mobile chat application that allows people who speak different languages to communicate based on AI technology to automatically convert voice or text to other people in the group.
Class	10

KH.2.

Title	NU Farm IoT
Authors	Mr. LUY Mithona, Mr. Heng Siek Hai, Mr. HENG SIEKCHHOR, Mr. CHEA TITY, Mr. MEAS BONA
Institution	Norton University
Patent	Processing
Description	NU Farm IoT is an innovative project that use internet to enable communication between agriculture machines and the farm itself. NU Farm IoT help monitor and tell the machine to work. We aim to help farmer with the power of internet by making the farm and machines work automatically by themselves. We believe in a world where people will do less work and machines will work by themselves.
Class	10

Canada

by

Toronto International Society of Innovation & Advanced Skills (TISIAS)

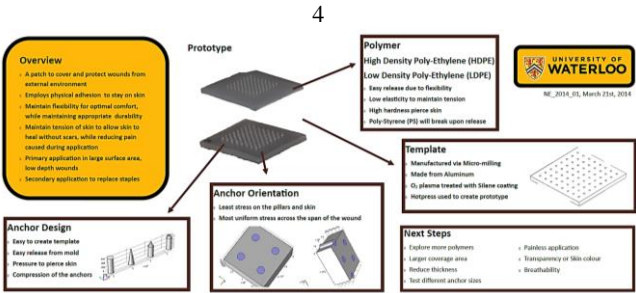
CA.1.

Title Physical Adhesive Patch for Wound Protection
Authors Tyler Hojae Cheung
Institution University of Waterloo, Canada
Patent no. N/A

Description

A patch to cover and protect wounds from external environment employs a physical adhesion to stay on skin and maintain flexibility for optical comfort while maintaining appropriate durability and tension of skin, allowing itself to heal without leaving scars and reduces pain caused during its application. Its primary application is on large surface area low-depth wounds and replaces staples. The anchor design is easy to create template, easy to release from mold and pressures to pierce skin with suitable compression of the anchor. The template is made of aluminum manufactured via micro-milling and with oxygen plasma treated with Silane coating.

Class



China

CN.1.	
Title	A driver safety driving system based on the Internet of things
Authors	Jiang Guanqiao
Institution	Dalian NO.8 Senior High School
Patent	Appling
Description	<p>During many times taking taxis and online appointments, I found that some drivers made many uncivilized behaviors while driving, which seriously affected the safety of passengers and others. In view of this situation, I designed the civilized driving supervision system.</p> <p>The system is mainly divided into driver side and monitoring side. The driver side is mainly responsible for the collection of video images from network cameras and voice reminder function. The monitoring side is mainly used to monitor the driver side of the car. When the driver is found to have uncivilized or illegal driving behavior, voice reminder is given to him, and when necessary, photograph is taken. Or video evidence collection. The driver's collection function is accomplished by the intelligent network camera. The driver's monitoring terminal is monitored by the intelligent device under Android platform, with a reminder button, which can be remotely reminded by clicking on the button and using the Internet. In addition, the driver can not drive at high speed without wearing seat belts, and voice prompts the driver. In addition, the system automatically recognizes and gives voice warning when the driver tries to hide the camera from surveillance.</p>
Class	10 / 14

Croatia

Represented by
CROATIAN INVENTORS NETWORK

HR.1.	
Title	Individualization of anonymous identities using artificial intelligence
Authors	TOMISLAV BRONZIN
Institution	CITUS d.o.o.
Patent no.	PK20140943
Description	<p>Individualization of anonymous identities using artificial intelligence - enables innovative human-computer interaction through the personalization of communication which is, at the same time, individual and anonymous.</p>
	<p>Thanks to artificial intelligence this solution, in real time, detects and recognizes the age group, gender, dimensions and proportions of the human body, and other specific characteristics of the person. Those data constitute the so-called a person's biometric footprint and are linked to a unique, but anonymous, identity that is recorded in the computer system, along with other information that make up the profile of the person.</p>
	<p>Identity anonymization is achieved by asymmetric encryption of the biometric footprint, with no additional personal information being stored, and integrity is ensured by the use of Blockchain technology.</p> <p>By using an anonymous but individualized identity, a person "unlocks" access to various content/capabilities of IT system that is accessed only through authentication. Collected data is GDPR compliant.</p> <p>This solution enables scenarios where anonymization of user identities and their individualization is required. Two examples of such scenarios are market segmentation and implementation of loyalty programs</p>
Class	10

HR.2.**Title****Pop-up kitchen PIA****Authors****DARKO SPILJARIC****Institution****DIZZ CONCEPT d.o.o.****Patent no.**

EUIPO RCD 007716121-0001, -0002, -0003

Description:

A cabinet with a TV that hides a fully equipped kitchen. Less than 1.6m² of space is enough for both functions. The whole kitchen is packed in a crate sized 110x100x210 cm and is suitable for transport via elevator. Standard configuration includes the TV, sink, dishwasher, waste selector, built-in refrigerator, microwave or standard oven, cooking hood, LED light, cooking hub, electrical sockets, shelves and cabinets. Doors have a depth of 15 cm and can hold items like glasses, bottles, groceries, etc, and they feature a safety switch that turns the power off for cooking hub when the doors are closed. Hence, the PIA can be used to furnish comfortable small apartments, apart-hotels, holiday homes, mobile houses, student accommodation, offices, yachts, guest rooms in large houses, etc.

Description**Advantage:**

It is possible to save from 3-5m² through better use of the available space thus lowering the cost of real estate purchase or rent. Significant savings are achieved by saving the energy used for heating, cooling, and maintenance. It is possible to install the kitchen in only 1 hour. The installations can be connected anywhere behind the base elements. Typical kitchens usually become waste after they are replaced. The PIA kitchen can easily be moved to other spaces and used multiple times.

Class

14

HR.3.**Title****GASIFICATION OF WASTE SLUDGE****Authors****VJEKOSLAV MAJETIC****Institution****DOK-ING d.o.o.****Patent no.**

EUTM 008132409

Problem:**Description**

- 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

9

HR.4.

Title ReCorr QCQ

Authors SANJA MARTINEZ, IVANA SOIC

Institution University of Zagreb, Faculty of Chemical Engineering and Technology

Patent no. Patent application

Description

Device for quick and reliable laboratory and field probing of polymeric, inorganic, conversion and oxide coatings on metallic substrates as well as of self-standing films and foils will be presented. The device developed by the ReCorr Laboratory at the Faculty of Chemical Engineering and Technology of the University of Zagreb provides the users with quantitative information on coating impedance as an indicator of the coating barrier properties and protective ability.

DEVICE ARCHITECTURE

The device consists of a pair of flexible, conductive polymer sensor electrodes sticking to a coated surface with the aid of a low-resistivity paste. The measurement is done between a single electrode and a substrate or between the two identical

electrodes. The electrodes are connected to the impedance spectroscopy instrument run from the PC, tablet or phone application (Window or Android platforms).

FIELD AND LABORATORY MEASUREMENTS

The device may be used for testing and inspection of coatings on metallic products and constructions. It is intended for measurements in testing laboratories, for coating systems and application processes qualification, in the paints and varnishes industry R&D laboratories, for quickly optimizing the coatings formulations and for the field testing of coatings in service.

Class

5

HR.5.

Title

SESTINE BACKPACK

Authors

Author: MATEA GRGIC; Menthor: MIRJANA PENDES

Institution

School: SKOLA ZA MODU I DIZAJN, Zagreb

Patent no.

HR-D20190115

Description

The Sestine backpack is conical in shape and consists of five trapezoidal pieces, each 60 cm high. Finishing stitches are additionally secured with decorative rivets, linked to a metal handle and shoulder strap. The bottom of the backpack is round and 30 cm in diameter. In the middle part of the side seam, a 30 cm long zipper is sewn. The backpack is modern, colored red, with elements of the Sestine decoration. Made of waterproof material, it is resistant to moisture and rain. It is a practical wearable souvenir, a fashion accessory for the daily rhythm of the city and for all seasons.

Class

13

HR.6.

Title

Insert Aqua Cream with Swiss Glacier Water & Undo Age Cream with Snow Algae

Authors

MIRJANA BRLECIC

Institution

PRIRODA LIJECI d.o.o.

Patent no.

trade mark: HR - Z20131494

Description

Insert Aqua Cream with Swiss Glacier Water

Crystal clear Swiss glacier water for freshness, smoothness and perfect harmony with skin.

24-hour refreshing hydration with Swiss glacier water encapsulated in liposomes. For extremely fresh, balanced

and rejuvenated skin. The crystal clear Swiss glacier water, with its unique synergy of minerals and lecithin molecules that transport moisture to the deeper layers of the epidermis, works in perfect harmony with the skin, leaving it fresh and smooth.

Undo Age Cream with Snow Algae

Snow alga - the key to skin longevity - protect and activates the longevity gene

This innovative anti-aging active ingredient is based on the extract of the unique snow alga that has managed to develop a strategy for surviving in extreme conditions on glaciers and permanent snow. On a cellular level, snow alga protects and activates two key factors, the Klotho gene for longevity and the AMPK energy sensor, which together improve the cell defence system, oxidative resistance to stress, detoxification, and cell repair.

Class

4

HR.7.

Title

LED RGB strip control by Android app and Arduino Bluetooth

Authors

Author: FILIP STIRJAN; Menthor: IVAN JURIC

Institution

School: TEHNICKA SKOLA RUDERA BOSKOVICA

Patent no.

-

Invention description:

Description

- 1) By clicking on one of the colors (the "box") on the cellphone screen, using the Android app, the colors of the LED RGB strip controlled by the Arduino change.
- 2) The Bluetooth module HC06 receives data from the Android application via Bluetooth.
- 3) HC06 sends / transmits data to the Arduino via wired connection.
- 4) Arduino board receives data: a, b, c, d... - each letter indicates / represents 1 color eg a = blue color and in that case the blue color lights up on the LED RGB strip.
- 5) With this app it is possible to select / change 9 colors and also turn off the strip.

Class

14

HR.8.	
Title	IOT Energy Monitoring
Authors	Authors: KRUNOSLAV GOMERAC i IVAN KAVIC; Menthor: GORAN ECIMOVIC
Institution	School: I. tehnicka skola Tesla, Zagreb
Patent no.	-
Description	With the device three independent loads can be operated by using a mobile phone. The user has simultaneous insight into the current voltage, current and power on the loads along with the total consumption data. All data is stored on the Internet and is available to employees for the purpose of supervision, quality control, consumption.
Class	2
HR.9.	
Title	Smart Clothing For People Diagnosed With Dementia
Authors	Snjezana First Rogale, Jelka Gersak, Dubravko Rogale, Zeljko Knezic, Suzana Uran, Sinisa Fajt, Daniel Casar Velican, Damir Begic, Sonja Sterman, Simon Rajh
Institution	Tekstilno-tehnoloski fakultet Sveucilista u Zagrebu Fakultet elektronike i racunarstva Sveucilista u Zagrebu Fakulteta za Strojnistvo Univerze v Mariboru, Univerzitetni Klinicni Center Maribor
Patent no.	Patent application
Description	<p>Description:</p> <p>Smart clothing for patients diagnosed with dementia serves as an everyday outfit with a reminder of the user's daily routine. At a certain time during the day, the reminder reminds the patient of the need to perform a specific activity that they may or must perform at that point of time, such as personal hygiene, dressing, breakfast, medication, etc. Most of all, serve as a friend to a person with dementia or disease such as Alzheimer's which characteristic property of the initial stage of the disease is characterized by short-term remembering. This type of clothing utilizes state-of-the-art communication systems and audio-visual components to appeal attention and textually display the activity which the person should perform. The reminder is made in advance, in cooperation with the doctor and caregiver of the ill person.</p> <p>Advantages:</p> <p>A diseased person diagnosed with dementia in the early</p>

stages of the disease has a special type of clothing that, while worn, reminds her to perform the daily routine of quality living. Innovation significantly enhances the quality and safety of the everyday life of a sick person when performing important activities that can be left out due to forgetfulness.

Purpose:

The invention is for people with dementia or Alzheimer's-like illnesses, characterized by short-term memory characteristic of the initial stage of the disease.

Class

6

HR.10.

Title

„M“ sensor for monorail trains

Authors

ZVONIMIR VIDUKA

Institution

ALTPRO d.o.o.

Patent no.

trade mark IR 1501978

Description

„M“ sensor for monorail trains is a special detection unit which provides safe and reliable detection of monorail train on track. Sensor is situated along the track and it senses the presence of the train by detecting its undercarriage. The current solution is a unique innovation in the world for the market of non standard modes of transportation which is gaining popularity.

Advantages: The advantage of the innovation is its flawless ability to detect monorail trains in harsh atmospheric conditions. Detection is occurring in conditions of great EMI (electromagnetic interference), from -40 to +80 degrees Celsius, in snowy, windy, rainy conditions... Moreover, sensor will not detect anything but monorail train. Any interference or detection of other objects is filtrated by smart architecture of the sensor and by special algorithms implemented in software of the intelligent unit. The complexity of building such a product is showed in the fact that this kind of solution is the only one in the global market which suits ALTPRO innovation oriented market approach.

Purpose: This innovative product is meant for operation inside vital safety systems for control and management of mass transit trains in urban areas. It is currently used in countries like China, Japan and USA. Taking into account the growing popularity of this mode of transport, it is expected that this product will be seen in operation worldwide.

Class

6

Egypt

EG.1.
Title

Hanged Buildings to Safeguard from Earthquakes and Terrorism

Authors

Mahmoud Galal Yehia Kamel

Patent no.

26134 (Egypt), 819974 (Japan), 784/2016 (UAE)

Description

* An innovative construction method based on hanging a multi-storey building or building complex hanged from steel or concrete peripheral columns using steel-wire cables.

* Used for Construction of: Onshore and offshore Residential, Tourism, Commercial, Industrial Buildings, as well as Nuclear Reactors.

* Safeguards from: Earthquakes, Bombing attacks, Marine currents, Tsunami waves, and Coastal Currents without affecting Marine Environment.

* Applications and Benefits: Suitable for construction of petrochemical, chemical and fertilizer factories, and nuclear reactors especially in offshore areas. A simple method to extend area in countries that suffering from lack of space to build more houses and facilities offshore without affecting marine life and without the risk of marine and coastal currents. Suitable for construction in all types of soft soil with high safety lifetime. When used as an offshore construction saves the opposite shore side from Tsunami waves and Coastal Currents without having an effect on the buildings itself.

* How can hanged building save lives: If a terrorist destroyed one of the concrete columns with a bomb, the other concrete columns will keep building hanged but it will be inclined & not collapsed and this will save lives. If a massive earthquake attacked the building; the shaking of the concrete columns will be absorbed through the steel wire cables and it will not transferred to the building, and if the earthquake was strong enough to destroy one the concrete columns, the building will be inclined but it will not be collapsed and this will also save lives.

Class

7

EG.2.**Title**

Techniques to Control Agriculture Pests such as Red Palm Weevils, Nematodes and Aphids Using Natural Compounds

Authors

Mahmoud Galal Yehia Kamel

Patent no.

29215 (Egypt)/ Patent application No. GC 2017-34181
(Granted in GCC & under publishing)

Description

* PURE PLANT EXTRACTS made from 13 different types of plants (40 - 70 % Plant residues), WITHOUT ANY CHEMICAL ADDITIVES

* Techniques include treatment methods and treatment compounds. The Treatment Compounds can control and protect against: Red palm weevils in palms, Nematodes in soil, Insect pests in trees and crops.

* The effect of Treatment Compounds: Anti-feeding effect, Resisting effect, Repelling effect, Systemic effect, Fertilizing effect.

* Advantages of the Treatment Compounds: Safe for Plants, Environment, Humans and Living Organisms, Simple in application and do not require safety precautions during production or treatment, Highly Effective with no need to add harmful chemicals, The plants can be treated before harvesting with no toxicity on Humans when eaten, Effective in Control and Protection against pests in both laboratory and field conditions, Long protection period and Effectiveness from one dose, It can be used repeatedly without emerging resistance, Give fertilizing effect with the increase in the production quality and rate by about 25%.

Class

3

EG.3.**Title**

A Nutritional Supplement from Prickly Pear Cactus Plant for Malnutrition Cases

Authors

Aisha Galal Yehia Kamel, Mahmoud Galal Yehia Kamel

Patent no.

Patent application No. 2040/2019 (Egypt)

Description

* An integrated natural vegan nutritional supplement, produced from prickly pear cactus plant, Free from

INTERNATIONAL EXHIBITS

Chemicals and Gluten, Halal, Fasting, Safe and not causing side effects, Easy ingestion, digestion and absorption, High nutritional value and low calories, and Suits all ages starting from one-year age.

* Contents:

- Good source of Vitamins as Beta Carotene, Vitamin C, Folate & Vitamin B6.

- Trace Elements: Calcium Iron, Magnesium Copper & Selenium.

- Rich in Antioxidants as Betanins & Flavonoids, and Amino Acids as Tyrosine & Tryptophan Glutamine.

* Helps to boost the body's energy, immunity, cognitive functions and muscular performance, and Helps to reduce blood sugar and lipids.

* So, it's helpful for: Healthy and sportive people, Fortified for nutrition for different cases of malnutrition, like: Chronic illness patients, Diabetic and metabolic syndrome patients, Gastritis, irritable bowel syndrome, Chronic fatigue syndrome and anemic patients.

* It's also suitable for: Healthy weight reduction diets, Improves the general condition for bed ridden patients, comatose patients, ICU patients and oncology patients after chemotherapy or radiotherapy sessions.

* It can be eaten directly or added to foods or drinks, or through the feeding gastrointestinal tube in cases of unconscious comatose patients.

Class

4

EG.4.

Title

Lateral Distribution of Loads in Super High-Rise Buildings to Reduce the Effect of Wind, Earthquakes and Explosions as well as increasing the Utilized Area

Authors

Mahmoud Galal Yehia Kamel

Patent no.

29057 (Egypt), Patent application No. 201580052952.0/2017 (China) granted and under publishing

Description

* A group of an outwardly curved peripheral arm around building corners, Arms tied to building corners and to each other using steel wire cables. Which works on the distribution of loads in the lateral outward direction to the group of arms.

* The Benefits: Give both balance and stability to the

building in order to reduce the effect of wind, earthquakes and explosions, Reduce size of building internal structure and foundations, which increase building internal dwelling spaces.

* The Advantages of Lateral Distribution of Loads in Super High-Rise Buildings:

- Super high-rise building symmetric in the area and size from the bottom to the top without the risk of wind effect on the structure.
- High stability, which improves both safety and susceptibility of living due to minimized swinging with the wind.
- Damping axial and shear deformation during destructive earthquakes.
- Lighter weight due to minimized internal structure and foundations, which extend the height limit and building suitability in different soil types.
- Less complexity in design and construction, which means less construction time and cost.
- Increased areas effectively utilized in the building, which increases interior space and reduce divided small intermittent and inappropriate areas.
- Secured building from terrorist attacks with the ability to withstand such attacks with minimum possible losses.
- Secured from planes crashing into the building (preventing repetition of World Trade Center Disaster) as it is surrounded and protected with peripheral arms and steel wire-cables.

Class

7

Hong Kong

HK.1

Title

Intelligent Wellness Walking Stick

Authors

Lincoln Lam ; Chan Yik Man; Chow Hiu Hei; Zeng Michael Tin Yu

Patent

The LAM Foundation

Institution

China 8,557,189 B2

The new coronavirus is spread through droplets and surfaces. Our “Intelligent Wellness Stick” is a new stick that protects elderly users from airborne virus and hand contamination, makes people's microenvironment safe during walks. It is first walking stick design in the world with wellness and health concern to improve quality of life of elderly population. Its built-in UV light handle with Photocatalytic Automated ultraviolet disinfection can kill 99% bacteria on elderly's hands wherever they go. With a built-in air purifier generating negative ions can effectively remove atmospheric particulate matter (PM2.5) and other pollutants. Our smart system (Purifier, sensor and air monitor) gives you quickly browse the operation status and keeps track of air quality. Our innovative design is to protect elderly users to be affected from germs on their hands and avoids air pollution during their walk in a city.

Description EN

Elderly public health is a global issue around the world. World Health Organization mentioned in their recent report that hand hygiene is important and about 80% of infection is caused by touch. According to a recent research by a scientist from Imperial College (UK), short-term exposure to traffic exhaust on a busy street can cancel out the positive effects a two-hour stroll would otherwise have on older adults' heart and lungs. Our UV Photocatalytic self-disinfection design killing up 99% of bacteria without chemical gel will not cause skin irritation problem. There is NO air filter needed in our design making our product cost effective. Negative ions also have additional positive effects on elderly users such as better blood circulation and stress relaxation.

Class no.

12

India

IN.1.

Title

Smart Wristband to Monitor Alzheimer's Patients

Authors

Hemesh Chadalavada

Institution

Jubilee Hills Public School, Hyderabad, Telangana

Patent no.

201941049590 (India, Provisional Patent)

Every 3 seconds a person in the world suffers from Alzheimer's. Patients suffering from this disease don't have control over their body. Hemesh's Grandmother was one amongst many who were suffering from Alzheimer's. She used to wander at abnormal timings from the bed without even caregiver's notice. Irregular Health-Checkups was also common. She even used to cause a lot of accidents at home. So for Alzheimer's patients worldwide, Hemesh created the Smart Wristband.

Description EN

This device is worn by the Alzheimer's Patient. It monitors the Health Status of the patient such as Wandering, Pulse, and BP. If the patient gets out of bed and starts wandering or, if the patient has any abnormal Health Conditions, an alert is automatically sent to the caregiver and the doctor. An App displays Health status of the patient. The Health status is automatically sent to the doctor as Daily Reports. A camera also monitors the patient and Detects any falls on the ground. There is also a SmartPillbox for the right pills.

He also created an Algorithm which uses Machine Learning which will automatically predict any wandering or falls.

Class no.

4

IN.2.**Title**

Novel Approach for Rainfall Forecasting on Cloud based Predictive Using Artificial Intelligence and IOT.

Authors

Achyuth Sarkar

Institution

National Institute of Technology Arunachal Pradesh

Patent no.

N/A

Nowadays the rainfall forecasting effortlessly this situation prediction is very much hard. As per the rainfall forecasting is a big challenge. And raining is very important thing of our human life. As per accordingly to the research, of rainfall intensity conducted through amount of data generated by the IoT devices and it is required very huge and the traditional databases do not have enough storage space. Under this circumstance Cloud database is most important tools. The rainfall forecasting has cloud-based data analytics with IoT as a major role, in this process Cloud database is very essential attribute. Under this, Data mining techniques are used to analyze this big amount of data available in cloud database. In this proposal, the IoT device records the data from the nature and stored in the cloud database.

Description EN

Data analysis is being on rain forecasting done on the data available in cloud, which is based on the data mining technique, and prediction is performed.

The rainfall forecasting information is sent to the farmer through a mobile phone application. The main aim is to forecasting the rainfall database based on the predicted information. **The Development and software testing** phase is used to bring about the rainfall prediction accuracy. It may assumed that the information/data is used to cover the information from attributes on the temperature, Fraction of cloud, wind motion, different types humidity, and different stages of rainfall throughout the year. Computer and Information Technology are running one of these simulations which will help provide more accurate forecast for farmers who depend on rain to successfully raise their crops.

Class no.

10

Indonesia

Represented by

Indonesian Invention And Innovation Promotion Association (INNOPA)

ID.1.

Title

SEAFERS (Smart Renewable Floating Energy Generator)

Authors

Danar Adi Irfanto, Muhammad Taufiq Faturrahman, Fitriicia Putri Rizki Ricinsi, Muchammad Rifki Abdillah, Alem Reyhan Savero Saputra

Institution

Institut Teknologi Sepuluh Nopember

Patent no.

-

Description EN

Because of the abundant potential of renewable energy that Indonesia has, we have innovations to create an integrated electricity generation system by combining Gorlov Helical Turbine and Savonius Wind Turbine. The work system of this generator is to convert kinetic energy from sea currents and wind energy into electrical energy through generators to meet electricity needs in Indonesia. Gorlov Helical Turbine and Savonius Wind Turbine will be installed on a floating platform with a semi submersible type.

Class no.

2

ID.2.

Title

PROLYCE (Plastic Recycling Technologies of Pyrolysis Process)

Authors

Dimas Arfiantino, Muhammad Fahmi Yusuf, Rose Mutiara Suin, Atha Rifqia Pradana

Institution

Diponegoro University

Patent no.

-

Description EN

Plastic is a material that can be found in almost every daily necessity. Based on the data, 85% of marine waste is plastic and it is predicted that plastic waste amount will increase to 104 million tons in 2030. It is estimated that plastic takes 100- 500 years to fully decomposed so it can cause pollution to the environment. The pyrolysis

process is a method that can be applied to decompose plastic waste. PROLYCE (Plastic Recycling Technologies of Pyrolysis Process) is a machine that decomposes plastic waste into alternative fuels using the pyrolysis principle with the innovation of electric induction heaters and temperature controllers that connected with IoT. The tank capacity of this tool is 5 kg of plastic and can result 2.5 L of alternative fuels. The works system of PROLYCE is using electric induction heating technology that connected to the heating element with a 1-2 hour of process at 300oC. After that, the plastic will melt and evaporate, then the vapor phase will enter the condenser and produce alternative fuels. Based on laboratory tests, the maximum alternative fuel results will be obtained when using Polypropylene (PP) plastic waste type, with octane number MON of 87,6 and octane number RON of 97,8. PROLYCE technology is a solution to maintain the environmental balance that is effective and environmental friendly. The results of the decomposition of plastic waste using PROLYCE tool can be used as an alternative fuel to face the scarcity of fossil energy globally in 2050.

Class no.

1

Iran

by *Iranian Top Inventors*

IR.1.

Title

Smart Mask to Protect Miners Lives

Authors

Mahdi Pourshabanan

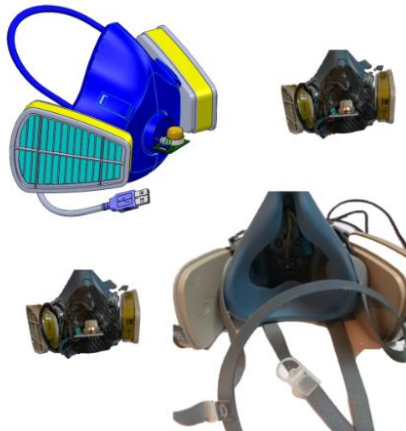
Institution

Imam Sadegh Highschool, Isfahan, Iran

Patent

The mining industry is among the top ten industries nationwide with high occupational injury and fatality rates, and mine rescue response may be considered one of the most hazardous activities in mining operations. On the other hand, rescue operations are a relatively high-risk activity. One of the most important hazards of mines goes back to Gases trapped in the walls that sometimes lead to death. For this purpose, the present invention developed a smart nano-mask that can filter air and detect harmful gases. The mask is equipped with smartly designed sensors and circuits that will alert the person quickly as well as insensitive cases to relief centers. In addition to gas sensors, pressure and temperature sensors are also designed in the current mask. According to the above, this mask seems very necessary for the miners.

Description EN



Class no.

12

IR.2.

Title Cytotoxic and Apoptotic Effect of Chitosan Nanoparticles and Extract of Glycyrrhiza glabra Against the Human Hepatocarcinoma (HepG2)

Authors Fatemeh Karimi, Seyede Sara Sadati, Kiana Ghorbani, Mahsa Shahbandeh

Institution Solaleh Highschool, Alborz, Iran

Patent ----

Description EN In 2018, liver cancer was the sixth most common cancer and the fourth leading cause of cancer deaths worldwide. Today's ample attention has been devoted to the construction of anti-cancer drugs with increased stability minimizing toxic effects. The main aim of the current research was to investigate the potential utility of chitosan nanoparticles with Glycyrrhiza glabra extract (liquorice root) on HepG2. The cytotoxic activity of the plant extract and chitosan nanoparticles against the cancerous cell line was assessed using an MTT assay. At first Nano chitosan was made by Ionic gelation method and to investigate the structure of nanocomposite were used XRD and SEM analyze. Also the methanolic extract prepared by solving powder in Specified volume of methanol. The demonstrated a significant effect ($IC_{50} = 50 \pm 1.3 \mu g/ml$) on anti-cancer activity. The result showed the synergistic influence of chitosan NPs with Glycyrrhiza glabra extract have higher cytotoxicity and apoptosis induction in HepG2 cells compared to their use alone. In other words, The % apoptotic cells induced by the extract and NPs were increased about 1.5-fold compared to the single extract and MTT assay showed chitosan didn't have negative effects on normal liver cells.

Class no.

4

IR.3.

Title Multi-server messenger based on Kateb protocol with the ability to use integration

Authors Seyed Ali Nooriyan, Mahdi Omid Najafabadi

Institution Allameh Mofid Highschool, Isfahan, Iran

Patent ----

Description EN This Program is client based on the Kateb protocol, it uses the federated Kateb protocol, This Program lets the

user choose a server to connect to. Additionally, This Program supports end to end encryption, groups, channels and sharing of files between users. It is available as a web application, as desktop apps for all major operating systems and as a mobile app for Android and iOS. The development of the app is primarily done by the company Seekaweb(my own company) **which is also involved in the development of the Kateb protocol itself** This Program is built with the Kateb React SDK which is a React-based software development kit to ease the development of Kateb clients. This Program is mostly built around web technologies and also uses Electron, a software framework to create desktop applications from web applications, to distribute their desktop clients for Windows, MacOS and Linux.

Class no.

10

IR.4.**Title**

Manufacture Of Making Machine For Kombucha Mushroom And Construction Of Durable And Waterproof Biodegradable Leather

Authors

Atena Tayyeb, Aynaz Beyzaei, Soufia Azizinia, Taraneh Izadyar, Marziyeh Azadfalah

Institution

Solaleh Highschool, Alborz, Iran

Patent

Description EN

As we know, leather has been a vital commodity since early human life. For the production of natural leather, a large number of animals are killed annually, and therefore artificial leather products are more welcomed than natural because of the complexity of the process. Production, high energy consumption during production, limited production volume and expired price of natural leather relative to synthetic equivalent goods. But unfortunately, because of the addition of chemicals to artificial leather, this type of leather is harmful to the environment. In this project, leather was made of Kombucha mushroom, which is biodegradable, flexible, high-strength and reasonably priced. This type of leather promises a better future for the environment. Materials used during the manufacture of leather using Cambodian mushrooms, such as coconut oil and beeswax, are free of chemicals and decompose in the soil after a specified period. It is very similar to cow leather and meets all the requirements of animal leather. Furthermore, in addition to the 100% sustainability aspect and

Class no.	1
<p>animal friendliness, it is even lighter than animal leather and can easily be worn on the skin as it is a natural product. In addition, the machine was designed and manufactured to better produce the mushrooms, which incorporates the mushrooms-producing material and provides the growth conditions of the mushrooms such as temperature, time, and ventilation to allow the mushroom to reach the desired size and environmental conditions. The finished leather was coated with a spray of hydrophobic SiO₂ nanoparticles to prevent the leather from decaying when wet.</p>	

IR.5.**Title**

The Effect Of Silver Cobalt Nanocomposite with Honey On The Biofilm Of Pseudomonas Aeruginosa Bacteria

Authors

Rozhina Teimoori , Samin Karami, Mahsa Shahbandeh

Institution

Solaleh Highschool, Alborz, Iran

Patent**Description EN**

Antimicrobial resistance in *Pseudomonas aeruginosa* is a major public health problem. Nowadays, honey is a topical antimicrobial treatments that well known to be efficacious against many bacteria including *Pseudomonas aeruginosa* and inhibiting the development of biofilms. The synergism effects of different nanoparticles with natural ingredients on the growth inhibition of bacteria have also been confirmed. Metal ion nanoparticle complexes are playing an increasing role in the development of antimicrobials. In this study, the effect of honey synergism with silver-cobalt nanocomposite on growth inhibition of *Pseudomonas aeruginosa* biofilm was tested. Minimum inhibitory concentrations (MIC) and minimum bactericidal concentration (MBC) were determined. Also culturing *S.aeruginosa* in GW medium and were analyzed by Time-kill test. To investigate the structure of nanocomposite were used XRD and SEM analyze. The results showed that cobalt-silver nanocomposite with honey has an inhibitory effect on *Pseudomonas* bacteria in both free and biofilm forms, although higher concentrations of honey were needed to inhibit biofilm compared to the free sample. This study confirms the antimicrobial and biofilm potential of cobalt silver nanocomposites with honey and can be used to treat infections caused by this bacterium.

Class no.

3,4

IR.6.**Title**

Comparative study of the effect of purified olive oil and olive leaf extract on cardiovascular and metabolic syndrome parameters

Authors

Dr. Soheila Mirzaeian, Ali Razavian,
AMIRHOSSEIN HAJIGHORBANI,
Sayed mohammadhossein hosseini najafabadi

Institution

MOUSTAFA KHAZAEILI

Patent

Description EN

In recent years, there has been significant interest in the reduction of cardiovascular risks factor due to diseases caused by oxidative stress, and it prevented by food item. Among natural antioxidants, the olive tree has been widely accepted as one of the species with the highest antioxidant activity via its oil, fruits, and leaves. It is well known that the activity of the olive tree by product extracts in medicine and food industry is due to the presence of some important antioxidant and phenolic components to prevent oxidative damage. The olive tree has long been recognized as having antioxidant molecules, such as oleuropein, hydroxytyrosol, and tyrosol, coffeic acid, and ligstrosid associated with the prevention of certain diseases.

Recent analyses underscore that the health benefits of olive oil could also depend on its phenolic constituents. Extra-virgin olive oil is particularly enriched with these molecules (1%–2% of the total). Extra-virgin olive oil had bad taste and scent and more expensive. The leaves of the olive plant are free and also contain phenolic compounds at a much higher concentration than those of the olive fruit and oil (1450 mg total phenolics/100 g fresh leaf vs 110 mg/100 g fruit and 23 mg/100 ml Extra-virgin olive oil).

Class no.

Medicine - Health Care - Cosmetics

IR.7.	
Title	Wind panel Designer with two specific goals on the roofs of houses
Authors	Ebrahim Mokhtari Esfidvajani, Hossein Mokhtari Esfidvajani, Ali Mokhtari Esfidvajani
Institution	-
Patent	-
Description EN	This panel is mounted with a specified height on the roofs of the houses and feed on sunlight. When the air clear and clean, these panels act as generators of electricity and when the air is contaminated, these panels automatically direct contaminated, These panels automatically direct contaminated air to the designated point outside the city
Class no.	1
IR.8.	
Title	Heavenly Peace
Authors	Vida Honarmandzad, Rasoul Sadeghi Khoueini, Pourya Abdoltajedini, Omid Sajadi, Sara Sobhani
Institution	-
Patent	----
Description EN	Mechanized and manual bed design for use by inactive patients in the hospital and at home. This bed is fitted with a heating system to keep the patient warm in winter and cooling system in summer. The function of this device is as follows: The patient is resting on the bed and depending on the specific timing the patient turns left and right. It is also equipped with a massage sensor to also massage the specific areas of the patient s body.
Class no.	4
IR.9.	
Title	Disinfecting Device for Fuel Station Nozzle Handle by Silver Nanoparticles
Authors	Anahita Mehrvar
Institution	Solaleh Highschool, Alborz, Iran
Patent	----
Description EN	Due to the growth of viruses and bacteria and their

transmission through public means, public health is very necessary. Gasoline nozzles are one of the most important tools that can have an impact on the human transmission of pollution. The purpose of this invention is to provide a suitable method for disinfecting the nozzles of the fuel in such a way that it operates at the proper speed and completely disinfects the nozzle handle of the fuel position. For this reason, this device has an obstacle detection sensor to detect the handle and send the command signal to the control board. The sprayers are then sprayed with disinfectant onto the handle. The disinfectant also consists of silver nanoparticles that have antibacterial properties and are not harmful to human health.

Class no.

Industrial and laboratory equipments

IR.10.**Title**

Remote smart wristband with heart rate determination

Authors

Maryam Ramezan Baghpa

Institution

Sepide Kashani Highschool, Khozestan, Iran

Patent

Description EN

The heart is the most vital part of the human body, and today many people in the community suffer from a variety of heart diseases, the majority of which are the elderly and people over the age of 45. The electrocardiogram is one of the most important medical devices used to diagnose many heart diseases. Due to the high volume of this device and its high cost, it is not possible to use it anywhere. Also, similar commercial models that are installed on the wrist are not accurate enough. That's why the wristband was designed to use a pulse sensor to measure heart rate and also has a Wi-Fi module that sends information to a display or multiple mobile phones without the need for wires. The power consumption of this device is very low and it is supplied with a power bank and due to its small volume, it is easily portable for a person. The device warns of heart attacks and irregularities in the heartbeat and asks for help, and has been able to reduce some of the environmental consequences of seizures and the risks of heart disease. It is also very suitable for people with heart arrhythmias.

Class no.

Medicine - Health Care - Cosmetics

Japan

JP.1.

Title

Able to disengage the phone from the chest support of both hands

Authors

Itonaga Shigenori, Oonishi Hisatsune

Institution

CAT Family Kabushikigaisha

Patent no.

Appling

Description EN

Mobile phones are already inseparable communication tools in people's lives, and they are widely used in navigation and intercom. Generally, they need to be held by hand. It is difficult to use without hands, and people sometimes need to operate with both hands in life and work. The invention can stand the mobile phone in front of the eyes, and can work normally when the mobile phone is separated from both hands. The invention uses two rubber bands to fix the opened mobile phone holder on the chest, and then the mobile phone is mounted on the mobile phone holder to work. Even when a person is running, the bicycle does not shake when it is shaken, and it can be folded into when not in use. The palm is large to fit in a bag or pocket.

Class no.

14



Korea

KR.1.

Title Grating Switchgear with Foreign Substance Blocking Function

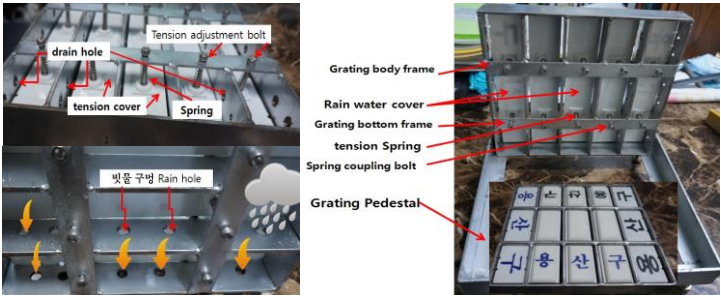
Authors KANG, SEUNG HO

Institution St. Johns School (USA)

Patent no. Patent Pending (Application Submitted)

Description EN

Rainwater trap grading plays a role in draining rainwater in the event of rain on roads. The drainage grating that can withstand the load is easy to clean when foreign substances are accumulated by spring tensile force on the plastic plate cover in the grating compartment to prevent foreign substances from entering the sewer on rainy days, and only rainwater is discharged into the sewer to filter out sewage, which is not used for drainage. The plastic cover with a hole in the top plate cover on the side of the road can display texts for local area promotional purposes, and when the rain shower falls, the drainage grating cover is automatically opened and closed by the tension of the spring by water pressure and physical pressure, and the rainwater is discharged into the sewer.



KR.2.	
Title	Solar Power Sterilization Water Purifier with hot and cold water dispenser
Authors	Seongwon Chung
Institution	Hankuk Academy of Foreign Studies
Description EN	This invention uses and stores solar energy during the day to activate thermoelectric semiconductors so that cold and hot water can be used.
KR.3.	
Title	Removidust – A lamp using Solar energy to remove mosquitoes, viruses, and fine-dust
Authors	In Yeol Yeo
Institution	Daewon Foreign Language High School
Description EN	This invention, Removidust, is a street lamp equipped with additional practical functions from the existing street lamp function. Removidust can expect three additional functions: extermination of germs, decomposition of fine dust and eradication of mosquitoes. Removidust, the name of the invention, was also composed of four words: 'Remove', 'Mosquito', 'Virus' and 'Fine Dust' to include this effect.
KR.4.	
Title	Self-Driving & Self-Calculating Cart
Authors	Junhyun Back
Institution	Brent International School Manila
Description EN	Self-driving cart is When an item is put into the cart after being scanned, the user will be able to pay for the products without going to the cashier. The cart will have autonomous driving functionalities that enables it to follow the user by itself. Furthermore, when a person scans their membership card on the cart, which is connected to his/her phone, the cart will follow the person via a Bluetooth signal coming from the phone using a passive RFID tag. The carts will also have cameras which will enable it to be able to avoid humans and an ultrasonic sensor to avoid obstacles along the way.

KR.5.	
Title	Emily (AI Pet robot)
Authors	Byung Hoo Park
Institution	United World College South East Asia (Dover Campus)
Description EN	<p>The robot is a cat-shaped robot that recognizes the owner. Kept at home, the robot talks on the monitor in the form of a chatbot. It also outputs songs on speakers for owners who live alone and functions as AI speakers.</p> <p>It will later expand into a robot that knows how to understand the emotions of its owner with their facial expressions, and it also has a function to recognize objects and avoid them. It has a separate function of reaching and hugging the owner through image processing.</p>
KR.6.	
Title	Cognitive Computing Recommendation System
Authors	Minkyu Jung, Youngseo Yoon
Institution	Oklahoma School of Science and Mathematics
Description EN	<p>This invention recommends clothes, meals, etc. by installing a Bluetooth CCTV camera in the house, understanding the thoughts or words of the owner of the house, and linking the place where the CCTV camera is installed with the place where the sensor is installed. It is also a home Total Care and Sponsor system that informs you that you need to wash and improve your skin even with your skin condition or face condition.</p>
KR.7.	
Title	Nonsurgical Bee Venom and Electrical Stimulation Therapy for Parkinson's Disease
Authors	Dyanne Ahn, Yihyun Nam
Institution	Yongsan International School of Seoul, Hankuk Academy of Foreign Studies
Description EN	<p>Studies have demonstrated that bee venom and one of its components, apitoxin, are able to stop or slow the loss of dopaminergic neurons. Bee venom acupuncture and its therapeutic effect have shown promising results as a novel treatment for Parkinson's disease.</p>

KR.8.	<p>Title marine speculative object removal and algae removal ship</p> <p>Authors Claire Sangah Park, Joshua Sangjin Park</p> <p>Institution Yongsan International School of Seoul</p> <p>Description EN A lot of power is needed to carry out the movement of unmanned automated boats and the removal of algae. To cover such power, a large solar panel covering the entire top of the boat is installed at the top. This not only prevents rollover accidents by simply installing the ship's power system, but also has the advantage of creating enough floor space inside.</p>
KR.9.	<p>Title A business card or textbook with a thermometer attached.</p> <p>Authors Siyel Lee, Ji Soo Hwang</p> <p>Institution Seoul Foreign School, Williston Northampton School</p> <p>Description EN This invention is a business card that helps students to check their body temperature from time to time by attaching a thermometer to a business card or textbook with a thermometer attached to the first business card to check a person's body temperature so that they can know the symptoms of a virus quickly and quickly. Also, the same function is attached to the textbook so that students can check their body temperature from time to time.</p>
KR.10.	<p>Title Make up & Dressing mirror</p> <p>Authors YOONNA CHO, Hannah Choi</p> <p>Institution Suhmoon girls high school, Korea international School</p> <p>Description EN It is a system that analyzes data called MNIST_Fashion to recognize clothes and shoes that fit the face through deep listing of Neural -Network and recommends suitable clothes through image processing. Also, through a neural network model, we recommend makeup that is suitable for clothes and overall, we teach the basic face of a mirror-viewer to make-up method.</p>

KR.11.	
Title	Multipurpose Flying sky and go underwater Drone
Authors	Jiho Park, SeoungWook Ko
Institution	Seoul International School, Seoul High School
Description EN	It is a drone that uses ballast tanks to clean air and remove microplastics and viruses in the atmosphere and handle sterilization when shipping cargo. They use photoplasma for multiple purposes, and they use microplastic, iodine radiation.
KR.12.	
Title	Language translate APP
Authors	Jaemin Chung
Institution	Kimball Union Academy
Description EN	Currently, if artificial intelligence chatbots are used on the Internet sites of each company, these chatbots are used in a way that allows key words to be spoken by their dialogue partners in their business and business fields to be answered when they speak the language. However, this is not a top-notch area in the NLP field, but is actually one of the ways to make it recognized through the listing of words.
KR.13.	
Title	Hydroelectric Energy Plant - Using Waste Water from Skyscrapers
Authors	Byoungyun Lee
Institution	North London Collegiate School Jeju
Description EN	In this practical experiment, the main goal was to utilize the wasted energy produced by the water flowing down through the pipes of every apartment using minimized hydroelectric generators. By installing 1~3 of these hydroelectric generators, there was a clear relationship between joules of energy gained, the volume of water, and the loss of hydraulic pressure. And, our hypothesis was that if multiple hydroelectric generators were connected in series and operated, then they would produce more electricity, compared to using a single turbine generator. And, an estimation of energy capability of wasting water from a skyscraper was carried out to alert for the public living on high storied building.

KR.14.	
Title	Automatic Invasive Species Detection App.
Authors	Jongwhae Lee, Seung Ki Cho, Hoon Stephan Chae
Institution	Yongsan International School of Seoul
Description EN	The main impetus for conducting this research was provide an easy way for ordinary citizens to participate in science as well as environment protection by using Machine Learning and Smartphones.
KR.15.	
Title	Artificial intelligence vacuum cleaner that disinfects the house and sterilises the clothing of the person who returns home after going out.
Authors	Edward Kim
Institution	Harrow School (UK)
Description EN	Conventional robot vacuum cleaners only have the ability to clean the house or kill pathogens through ultraviolet light source. This invention has a vacuum suction pump at the bottom that not only inhales rubbish on the floor, but also adds sterilisation function by spraying disinfectant and wiping the floor with a mop.
KR.16.	
Title	The machine that supports paralyzed patients by digitally detecting facial expressions or brain waves
Authors	Sylvia Kim
Institution	United World College of South East Asia (Dover Campus)
Description EN	This invention was invented when the paraplegic can't speak or the other person can't understand it. It is a machine that allows the camera to recognize the expression and recognize the patient's thoughts or brain waves and transmit information to an artificial intelligence speaker or an artificial intelligence screen speaker linked to the machine to do what the patient wants.

KR.17.**Title**

3D-HisSite: 3D Reconstruction of Historic Sites Damaged by Drastic Climate Change via Single Photo Utilizing Deep Learning

Authors

Seunghyeuk Lee, Seung Hyo Lee

Institution

Korean Minjok Leadership Academy

Description EN

Recently, severe effects of drastic climate changes have eroded or destroyed historical sites, posing a grave risk in preserving them. Despite efforts to create 3D shapes of the remaining historical sites (such as the CyArk project) to bequeath these historical values digitally, current methods cannot restore the historical site's former shape that does not currently exist or have already been damaged. Thus, to address these problems, we explore a complex deep learning network aided program that aims to generate a 3D voxel model via single image input. Inspired by the success of Stanford University's 3D-R2N2 network, the program's network can reconstruct the 3D shape of the historical site using only photos of it, even if the site is not currently remaining. In this invention, three networks that have differences in the encoder model (simple/residual), the recurrence model (LSTM/GRU), and the decoder model (simple/residual) were compared in making 3D shapes from images. The networks are trained and validated via ShapeNet dataset with 15,000 models and the evaluation of the networks are compared by the voxel IoU of each network. The networks are then fine-tuned with our own Historical Site dataset which contains 87 models. We finally selected the best model (Residual-GRU-Residual model) to reconstruct the 3D model and applied it to the program so that quick reconstruction is possible. We are planning to develop a website or an app, which we hope will make it easier for many people to pay more attention to historical sites and help preserve historic values.

Class

10

*Korean inventions were coordinated by TISIAS
for
Korea Invention News (KINEWS)
&
Korea University Invention Association (KUIA)*

Macao

By

Macao Innovation & Invention Association

MC.1.

Title Eco Shopping Cap
Authors Wing CHAN, Zixin LUO
Institution Macao Innovation & Invention Association/Macao Polytechnic
Patent no. China :ZL201720658464.0 approval no. CN207590201 U

Macao : R/000004

8 million tons of plastic waste entered the ocean annually that damaged the Sea life. A solution must include a multi-pronged approach, including stopping plastic from reaching the ocean and more education so people would reduce consumption of single-use plastic bags.

Description EN

An environmentally-friendly bag that can be placed on the top of the cap after folding, including a bag body having a zipper opening at the top, which is combined with the cap body by a double-sided zipper, and has a function of being able to be completely removed.

Wherein, the bag body is waterproof, breathable, antibacterial and processed, and has a flexible and non-toxic substance and an ecologically harmless textile fabric, and the texture is soft. After the bag is opened, the hand strap is sewn with a movable hook. After shopping, that can be hung on the handrail, which is convenient and energy-saving. A detachable environmentally-friendly bag

Class

1



Macedonia

MK.1.

Title

CLEANING CONTAMINATED WATER WITH THE BIOSORBENT: OLIVE SEED

Authors

Andrej Popovikj , Boris Nocheski

Institution

Yahya Kemal college - skopje

Description EN

This study was conducted to investigate the effect of olive seeds powder and its ability of heavy metal absorption. Heavy metals that we used were: Chromium (**$\text{Na}_2\text{Cr}_2\text{O}_7$**), Copper (**$\text{CuSO}_4$**), Lead (**$\text{Pb}(\text{NO}_3)_2$**), Manganese (**$\text{KMnO}_4$**), 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 99.9% for Pb (15% green olive seed powder) to lowest range to 81.6% for Cu (5% green olive seed powder). Although we didn't measured pH, it appeared that increasing the amount of olive seed powder 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 olive seed powder, is useful, alternative method which indicated decreasing in any situation. The technique appears industrially applicable and viable.

Class no.

1

MK.2.

Title	Fresh plant of lavender, fresh flower of lavender and dried lavender “Lavender-wonder plant that removes heavy metals from water”
Authors	Meryem Alkin , Engin Alkin
Institution	Yahya Kemal college - Skopje
Description EN	<p>My aim is to prove that with this natural resource lavender I can make the quality of water way better, especially the quality of polluted water, and with that We can make better conditions for living and We will make better environment and make the people`s lives better. Our earth is getting more polluted every day, we live in environment where we breathe toxic gasses, not oxygen. As environment is getting polluted also water is getting more and more polluted every day. Some people like those in Africa don`t have water even to drink, and we are polluting our water with heavy metals.</p> <p>For our project we chose the plant named as lavender, because this plant is : easily accessible to everyone, low-cost and not harmful to nature . With Manganese , the best absorption percentage is achieved by the help of 0.4g mashed lavender plant: 97%, With Copper,the best absorption percentage with the help of 1.2g mashed lavender plant : 90.66%. With Chromium , the best absorption percentage is achieved by the help of 0.4g mashed dried lavender : 97.4%. The best results we got were with absorption of Lead with the help of mashed lavender plant : 99.98%. It`s also preventing water for being polluted and toxic, with this resource we can easily stop the migration of heavy metals in water. We should start using this resource because all living organisms consume polluted water, not water that is preferred for our organism, we`re destroying ourselves.</p>
Class no.	1

MK.3.

Title	Rubberized Asphalt from Recycled Rubber
Authors	Omar Kolashinac Marijana Cvetkovska
Institution	Yahya Kemal college - Skopje
Description EN	<p>This research is about old tires which usually are thrown away and burnt in yards. The purpose of the research is to implement this new idea into the real world in order to raise awareness in people, to protect the ecological environment of the high carbon monoxide emissions that</p>

the burnt tires emit and to help people with support material with the aim of making roadways. If you've ever owned a car, chances are you had to change the tires at least once, leaving you with a dilemma as to where to put the used tires. Thankfully, the times of burning tires in your yard are long forgotten, and if there's no tire recycling facility near, this idea that we are about to present can change the world for a greater good.

Research indicates that tires will slowly leach toxic chemicals into the surrounding environment, but many of these studies describe long-term effects when exposed to the elements. It's probably a good idea to refrain from using them to plant edible plants, but the main idea is to mix the old tires with mortar to produce asphalt. This will help a lot of businesses to profit and the environment will have one less major problem.

Class no.

1

MK.4.

Title

**Greening solution for environmental pollution:
converting waste clothes into smart car exhaust
filters**

Authors

Iva Jorgusheska

Institution

“Yahya Kemal College” – Skopje

Description EN

The aim of this project is to convert waste clothes and other waste materials into smart car exhaust filters. The hypothesis of this scientific research is that: ***If we use waste cotton and other waste clothes materials as well as tea bags and inedible biomass, we will be able to reduce the amount of CO, CO₂, HC and increase the amount of Oxygen in the exhaust fumes from cars.*** In order to prove our hypothesis we performed 24 experiments. On 3 different types of cars (one that uses gasoline, one that uses LPG and one that uses diesel oil), we tested out the 7 filters. The filters consist of a tube filled with waste materials (5 filters with different types of waste clothes – cotton, synthetic material, georgette and “porhet” which is type of cotton, 1 with used tea bags and 1 with waste biomass). We measured the emission of already stated gases and then we compared it with the results obtained when the filters were used. Waste clothes filters showed an absorption of CO with

efficiency up to 100%, CO₂ with efficiency up to approximately 79% and HC with efficiency up to 96%. This project solves two big and world-wide important problems with a very greening-ecologically friendly, efficient and low cost method. Based on this in future we plan to implement this filters in our every- day life and to develop them to a professional level in a collaboration with engineers and scientists

Class no.

1

MK.5.**Title****Antimicrobial Bio-film from Rosemary****Authors**Iva JORGUSHESKA Matej JOVCHEVSKI¹**Institution****“Yahya Kemal College” – Skopje****Description EN**

Our project aims to create an antimicrobial bio-film for food packaging that would be non-toxic and environmentally friendly. Our base ingredient for this product is starch. On the basis of biodegradability, availability, renewability, non-toxicity, and affordability, starch is one of the most promising of all the potential biopolymer materials. The use of starch in packaging promotes sustainability and addresses the negative impact non-biodegradable plastics pose on the environment. Our procedure for creating this bio-film is as follows: starch reacts with acetic acid in an aqueous solution yielding starch acetate which is more transparent and which requires a lower temperature for gelatinization. Sorbitol and glycerol, which act as a plasticizer, are then added to this mixture along with rosemary. The mixture proceeds to be heated until a viscous gel is formed which is left to cool at room temperature. After some time, the gel hardens leading to the desired bio-film. An integral part of our bio-film is the inclusion of rosemary which has been proven to exhibit antimicrobial properties. With this addition, the bio-film inherits these antimicrobial properties. Separate bio-films were produced with different proportions of ingredients to determine the optimal amount of each substance that is to be used to procure the best bio-film.

Class no.

1

MK.6.**Title****Cleaning Air With House-Plants****Authors**

Umit Uzunboy - Omar Kolashinac

Institution**Yahya Kemal college - skopje****Description EN**

We, Umit Uzunboy and Omar Kolashinac, are living in Skopje, North Macedonia. In 2018, Skopje became the most polluted capital city in Europe, reaching the highest annual mean of PM 2.5 (which is equal to 200 in the scale we used in this experiment), according to the World Health Organization. The air pollution is at its highest value in winter due to Central Heating Power Plants. So we decided to work on this experiment of NASA in order to find alternative sources for cleaning air. The aim of the project is to prove that the Air Pollution can be reduced by some houseplants which are very abundant throughout the Earth. In order to achieve this I used some houseplants which are easily accessible and some harmful gases which we are exposed to every day. Initially I placed the plants (*Red-edged Dracaena*, *Peace Lily*, *Florist's Chrysanthemum*, *Flamingo Lily*) into isolated bottles and exposed them to the harmful gases that I chose (CO₂, *carbondioxode*, and NH₃ 25% *ammonia*.)

Class no.

1**MK.7.****Title****Oldmothers' cream in the spirit of nature****Authors**

Mila Dimkovska, Angela Tosheska

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

Our health is the most precious thing that human beings can ever possess. Medicine and pharmacy are so sophisticated nowadays, but we should not forget about the traditional and alternative medicine and the plants that have so many healing characteristics. Our goal is to make an unguent that will help the burned or damaged skin to repair itself faster, and at the same time to avoid scars on the part that needs rebuilding. At the same time in this process of recovery people will not have to use pills or different chemicals, will avoid going to hospital every day and will not have to tolerate the pain caused by everyday surgical dressings. According to the

experiment we did we came to the conclusion that our hypothesis is completely correct and the healing process occurs fastly.

Class no.

4

MK.8.

Title

Improving the Efficiency of Coal Thermal power stations by the use of a Stirling engine

Authors

Mila Lazarova, Darian Janevski

Institution

Yahya Kemal Skopje

Description EN

With cities at a constant growth, the need for electrical power is greater and greater. More than half of the electrical power sources in the world are thermal power stations. They are found even more than the renewable sources of energy like hydropower stations. Thermal power stations burn fuels like coal, natural gas or some type of radioactive material like radium or polonium in order to produce steam. Later this steam is used to rotate a turbine which is connected to a generator. But, on the other hand thermal power stations produce enormous quantities of harmful gases. Apart from that, only 40% to 50% of the energy generated by thermal power stations is used for the production of electrical power, the rest of the energy is used for heating homes or it is not used at all.

The Stirling engine was invented in the time of the industrial revolution, but today it is not widely used even though of its efficiency and quiet operation. The Stirling engine operates on the principle of temperature difference. A gas expands when it is heated and it contracts when it is cooled. The constant expansion and contraction of a gas in a cylinder moves two pistons which are connected to a flywheel. With the use of this device the efficiency of thermal power stations would improve. Fossil fuel power stations burn coal at around 1900 °C, also water is used to condense the steam into water. All of this means that there are suitable conditions for the use of a Stirling engine.

Class no.

2

MK.9.**Title**

Natural homemade night cream- a new low cost solution for overnight beauty

Authors

Mila Lazarova, Mila Dimkovska

Institution

Yahya Kemal Skopje

Description EN

The aim of this research was carried out to formulate and to produce a face cream containing organic products like: spirulina powder, coconut oil, ginger etc. By doing so, this research is based on real experiment by combining several organic products. In this experiment we have used products for combination to dry skin products, since we have always had problems with finding the perfect face cream for our dry skin. This project will begin by explaining skin care, the products that it contains and their benefits. Then it will show the steps on how the experiment has been done, and its result. We used all organic products because we think they all have the same effect, it's like they support each other, they help each other for better effect on the skin, because each of them has their own perfect solution for skin. These products also speed the circulation; they heal scars and feed the skin. Like coconut oil, the fatty acids in coconut oil help it to work as an anti-inflammatory and anti-bacterial natural product. Another good side is that we bought all products here in Macedonia, with a very low price which made our job a lot easier. In conclusion, this experiment was successful, with no side-effects and we got the results that were expected.

Class no.

4

MK.10.**Title**

Solar Powered Air Cleaner Street Light

Authors

Betul Gul ERDIL , Chedo TRPESKI

Institution

Yahya Kemal College

Description EN

Environmental pollution is one of the biggest challenge of the world today. Overpopulation has been observed in the recent century and its connection to all problems cannot be ignored. The purpose of this project was using sunlight as natural, continuous, renewable, green and free energy source to light and clean the streets air. It is expected that using sun light as economic and ecological source could help to improve air quality of our polluted

cities. With this project, we have designed for the first time an eco-friendly solar-powered air cleaner streetlamp. Our aim was to reduce the amount of polluting agents in the streets that we live. Several filters and light types were compared to find out the most suitable combination. We have assembled, patent waiting innovative solar powered street lamp that lights and also cleans the air. Design was consisting of high efficiency solar panels, two air fans in the body part of the lamp with carbon and HEPA air filter. air quality was measured several times with different filter types. Air quality was altered before and after filtration. Pollutant particles were decreased significantly after filtration. We are planning as future implement to apply similar method and design to our bus stops, classrooms, corridors and schoolyards to give our friends studying in a purified pollutant free atmosphere. Future energy economy will consist of many renewable energy technologies use in combination. By improving the usage of these energy sources we can improve the air quality for better environment.

Class no.

1

MK.11.**Title**

Solar Water Condensation From The Air For Plant Irrigation System

Authors

Kaltrina BYTYQI, Indzi JRADINOSKA

Institution

Yahya Kemal College

Description EN

Energy is essential to life and all living organisms. The sun is the source of all the energy available on Earth. It is essential that we choose our energy sources carefully. The true cost of energy is more than just dollars and cents; there are important economic, political and social factors and consequences to consider as well. In this project it is aimed to turn air into water, based on the natural processes of condensation. Condensation is the change of the physical state of matter from the gas phase into the liquid phase. The word most often refers to the water cycle. By using this method, we have designed solar powered automatic irrigation system to supply water for plant even in arid climates. One of our

purposes is to use energy from the sun to condense water from air for an applicable economic and eco-friendly design. Scientists turn air into drinking water with a device powered solely by sunlight, device that turns air into drinking water. We use solar panels instead for an endless energy source. Air is drawn into the unit by a solar assisted fan, the panel in the center produces heat that warms air. Solely warmed air meets with the cooler part that condenses the water particles in the air. Condensed air droplets gradually stored in a reservoir inside the unit. Gathered water is delivered by solar irrigation system to the plants. Water from air is hope even for watering plants in dry anhydrous climates. This unique new design will help watering plants with the help of sun in any habitat.

Class no.

2

MK.12.**Title****Torch powered by human energy****Authors**

Eranda Ajdini, Leona Marku

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

We decided to choose this project in order to solve a worldwide issue that unfortunately not a lot of people focus on, since it only emerges in some countries throughout the world. In countries such as Niger , Tanzania , Liberia due to reasons such as financial stability, poor living space, environmental catastrophes ,state of war, people have to worry about their access to electricity , which is significant in attend to live nowadays . Luckily we have found a way to try and solve this issue by building a torch powered by the generated energy, coming from the heat of the human body. Another reason why this project is crucial, is the glorification it gives to us as humans, how our bodies can give out energy in order to produce light, without generating wastes such as for example, natural gas releases carbon dioxide and nitrogen oxide leading to air pollution and smog. Our environment is in a very critical stage currently, we talk about fabrics, industrial pollution, plastic pollution and more but we do not choose to concentrate on the pollution that electricity produces since we believe we cannot live without it,

which is true, so we need to find a way to generate electricity in a form that would not harm our environment. Also this time the energy that is generated in our body (which is equivalent to 100 watt light bulb) and is usually wasted, will be used in order to produce needed electricity.

Class no.

2

MK.13.**Title****The miracle of Avocado****Authors**

Svetozar Milosevski Ivan Stejovski

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

Clean water is a necessity for all human beings. It shouldn't be something that only a part of the population has access to. But with the increasing amount of pollution we make this almost impossible. Water is being taken for granted and the scarcity of drinkable one is ignored by almost everyone. If we don't stop wasting and polluting water we will soon run out of it.

Pollution takes place when toxic substances get dissolved in water. The biggest water polluters are factories who constantly dump their toxic waste which mostly comprises of heavy metals in the nearest source of water since it is the easiest way to dispose of it. These noxious substances are harmful to all living life. This is why we decided to find an innovative and productive way to clean the dirty water and then reuse it for drinking or other purposes.

The way we decided to clean the water is by means of avocado seeds. Avocado seeds are a very efficient organic cleaner that can be used to reduce the cost of cleaning water.

Class no.

1

MK.14.**Title****Zeolite and Lavender Heavy Metal Hunters in restoring soil****Authors**

Kiril Ristevski, Lara Samardzieva

Institution**Yahya Kemal College 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 surroundings. It would be very beneficial if we could decrease the number of heavy metals that are found in the soils in industrial areas all over the world. This represents a big problem nowadays. The main reason why we chose this project is because they have a bad influence on people's health and overall wellbeing, that's why we want to prevent this occurrence. One of the ways to get rid of these futile materials is by using the mineral Zeolite. **We chose Zeolite as a way of cleaning the soil because this mineral is cost-efficient.**

Our goal is to prove that contaminated soil can be revitalised by this tectosilicate and after that it can be used for agricultural purposes. Formerly we took soil samples from the highly radioactive industrial area in the city of **Veles, Macedonia**. Secondly the soil samples were examined and we confirmed that the land was corrupt. In the experimental part we used Zeolite and lavender in different concentrations with the previously gathered samples. It took 3 months for the detoxifiers (Zeolite and Lavender) to react with the soil. Meanwhile we planted wheat in bowls with soil and foliar feeding zeolite for us to be able to notice the quantity difference of heavy alloys in each pot. After three months we took samples from the soil and had them tested separately using an atomic absorber ICP OES. The atomic absorber gave us the envisioned outcome. With the utility of the zeolite, the volume of heavy metals is substantially decreased. Considering that the results are positive, our research showed that the soil is up to 96% cleaned. We can use this method for improving the environment, getting cleaner soil, more refined products and an overall purer way of being.

Class no.

1,3

MK.15.**Title****Biodegradable Packaging****Authors**

Snezana Koleva, Gordana Todorova

Institution**Yahya Kemal College, Skopje**

With this project, we intend to help the environment by creating a new biodegradable and eco-friendly product that can be used as packaging. The project proves that plastic, polymer foam and other related materials are not the only materials that can be used for packaging. These substances are toxic to nature and human health; still, they are used in everyday life because they are very practical. Because of this, we wanted to create a material for the same purpose, but with more beneficial characteristics for the overall environment.

Description EN

To create our new product, we used organic ingredients, like mushrooms, hay and egg whites. First and foremost, the ingredients are easily accessible everywhere in the world and low cost. By mixing them we obtained a hard-composed structure, due to their specific properties. We show step by step how efficiently they assemble to form a solid composition which can be used as a package. In the end, we obtain a new useful and functional biomaterial that can be a suitable replacement for plastics. Another benefit, that makes this project even more effective, is that the nutrition values of the products which we are using can help the soil (as fertilizer). It improves its characteristic features which are essential for the proper growth of every plant species. Finally, once used product won't be garbage for the environment, on the contrary, it will provide many benefits for nature, as well as for our everyday life.

Class no.

1**MK.16.****Title****Heavy metal removal by using organic vinegars****Authors**

Teodora Smiljevska, Dea Rajhl

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

Necessary substance to stay alive is water. Without water, the planet would look entirely different than it does today. This gift of nature makes up 70% of the surface of the Earth with only 1% being fresh water that is easily accessible for people. Its availability is a big economic and social problem. This study was conducted to investigate the effect of aqueous solution formed from Apples, green grapes, black grapes and pomegranate (They were waited 45 days to

become organic vinegars) and their ability of heavy metal absorption.

Substances that we used were: Zinc ($\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$), Copper (CuSO_4), Lead ($\text{Pb}(\text{NO}_3)_2$), Manganese (MnO_2) from multi-component systems at different adsorbent/metal ion ratios. We used these heavy metals altogether since we tried achieving the same level of pollution like the ones in the most polluted rivers in Macedonia. The optimum absorption was found to occur at contact time 18h, adsorbent dose at range 99.1% for Pb (10% black grapes vinegar).

For our project we chose these organic vinegars because they are: easily accessible to everyone, low-cost and not harmful to nature.

Different parameters such as amounts and absorption of heavy metals were evaluated. Our aim

is to prove that with this natural resources we can make the quality of water way better and with that we can make better conditions for living by making the environment better. Our earth is getting more polluted every day, we live in

an environment where we breathe toxic gasses, not oxygen. As environment is getting polluted also water is getting more and more polluted every day. Some people don't have water to drink, and we are polluting our water with heavy metals.

Class

1

MK.17.

Title

The environmental effects of writing: Finding an eco-friendly economical and safe way of writing

Authors

Matej Milosievski

Institution

Yahya Kemal College - Skopje

Description EN

2019 was a year in which we witnessed a tragic series of events. The burning down of the Amazon rainforest. At the beginning of 2020 the Australia wildfires occurred. The result of these tragic events are thousands of animal species going extinct, millions of burned down trees, and record high global CO₂ emission level. However there are also other factors which are harmful for our

environment and present a direct danger to our very existence. One of these factors is the methods that we humans use for writing. The purpose of this project is lowering the amount of trees being cut, and the total plastic production used for pens and pencils by finding a new ECO friendly, affordable and safe way of writing. How, you may ask? By the use of the infinite metal pen. The infinite metal pen oxidizes the paper, therefore not using any ink or graphite. Therefore it can write for up to 80+ years. From an economical aspect, using the infinite metal pen would save one average student 170\$ - 256\$ per year, considering that the price of an my infinite metal pen costs 3\$, including the protective encapsulant layer. Moreover, the infinite metal pen could save up to 1,1 million trees from being cut down, each year. Plastic production could be lowered by up to 21.5 million tons of plastic each year. This will indirectly reduce the CO2 emissions as major target within the EU strategy in the framework of fighting climate change. (248 words)

*These calculations are estimations based on related information gathered from our research, questionnaire and online sources. No exact number can be given because of the different shapes and sizes of pens and pencils, as well as the differing economy around the world.

Class no.

1

MK.18.

Title

The Quince and its Miracles

Authors

Marija Shukulovska, Marko Veselinski

Institution

Yahya Kemal Collage Skopje

Description EN

Water pollution is one of those subjects that everyone seems to ignore despite its importance. Clean water nowadays seems to be more of a luxury than something everyone should have in their homes and overall in their lives. It is clear that humanity has taken water for granted, the consequences are visible, but still few people tend to take action in making things better. Water gets polluted when water bodies get in contact with toxic substances, and the toxic substances dissolve

in them. This leads to degradation of the water quality. Nowadays, a huge number of factories take part in polluting water, throwing toxic substances in it such as heavy metals, and making it deadly if used by living creatures. Our project includes an efficient, inexpensive, innovative and environmentally friendly way to clean polluted water, so after it can be reusable in different ways such as drinking and technical purposes.

Cleaning water using quince fruit, which is easily available, inexpensive, and also cleans a great percentage of heavy metals from the water, is what we will try and demonstrate to you within our project. According to the results we've obtained from our experiments and their financial costs, compared with the ones used in water processing factories, this shows to be an easy, fast and inexpensive way to clean polluted water all around the world.

Class no.

1

Malaysia

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

MY.1.

Title	Graphene oxide/TiO₂ Thin film As a Self-Cleaning Glass
Authors	Azliza Azani, Dewi Suriyani Che Halin, Mohd Mustafa Al Bakri Abdullah, Mohd Arif Anuar Mohd Salleh, Kamrosni Abdul Razak, Varistha Chobpattana, Lukasz Kaczmarek
Institution	Universiti Malaysia Perlis (UniMAP)
Patent no.	MY-172024-A
Description EN	This invention is to produce a thin layer coating on for a glass that exhibits a self-cleaning property. In particular, the sol-gel method was used followed by spin coating technique to produce an environmental friendly thin film. TiO ₂ was modified with graphene oxide to further enhance the self-cleaning properties of the coating.
Class no.	1

MY.2.

Title	A NEW DESIGN OF HEAT-ACOUSTIC STANDING WAVE TO ELECTRICITY (H-ASw2E)
Authors	Ir. Irfan Abd Rahim, Assoc. Prof. Ir. Dr. Shayfull Zamree Abd Rahim, Assoc. Prof. Ir. Dr. Mohd Fathullah Ghazali, Ir. Mohd Nasir Saad, Mohd Farizuan Rosli, Ir. Amarul Talib
Institution	1) Green Design and Manufacture Research Group, Center of Excellence Geopolymer and Green Technology (CEGeoGTech), Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia. 2) School of Manufacturing Engineering, Universiti Malaysia Perlis, Kampus Tetap Pauh Putra, 02600 Arau, Perlis, Malaysia.
Patent no.	PI201915152
Description EN	The invention is a new design of Thermoacoustic Energy Converter (H-ASw2E) implementing the standing wave system by conducting Fluid Structure Interaction (FSI). This invention is a result from a

research and development of a portable thermoacoustic heat engine. This engine will convert energy from any of a waste heat into acoustic power. The H-ASw2E operates with a temperature gradient imposed on a stack with hot and cold heat exchangers, which then induced pressure oscillations. The thickness of Hot Heat Exchangers (Hot HX) plays major role in effecting the maximum acoustic power generated, the level of onset temperature difference and maximum pressure amplitude followed by the stack length and due to a resonator length of the heat engine. (max 250 words)

Class no. 2

MY.3.

Title

Novel Fused Deposition Modelling (FDM) 3D Printed Biodegradable PLA Stent

Authors

Noorhafiza Muhammad, Mohd Mustafa Al Bakri Abdullah, Amirul Aysraf Azli, Narzrezal Abd Razak, Mohd Shuhidan Saleh

Institution

UNIVERSITI MALAYSIA PERLIS

Patent no.

PI201805152

Description EN

With the demand of coronary artery stents rising every year, the stent production demands a higher quality, lower cost, faster and economical process. Due to its availability relatively low-cost price and adaptability, PLA has been identified for an ideal material for biodegradable stents. Over the past decade, the manufacturing process par excellence for coronary artery stent was the laser micromachining. With the emerge of 3D printing process as the alternatives system for producing stent, Fused Deposition Modelling (FDM), one sort of 3D printer has gained attention for its low cost, high reliability, simple operation & personal designing and demonstrated promising solutions in stents fabrication. The use of 3D printing for stent purpose is newly emerge. This work focus on the parametric study of 3D printing process which suggests the suitability and promising in coronary stent fabrication.

Applications: Coronary stent for medical applications

Class no.

4

MY.4.

Title	Recyclable Magnetic Nano-Adsorbents (ReMagNA)
Authors	Norsuria Mahmed, Hazreen Nadiyah Husni, Ho Li Ngee, Mohd Mustafa Al Bakri Abdullah
Institution	Universiti Malaysia Perlis
Patent no.	Patent Search No: S/UNIMAP/14MY43/GM
Description EN	ReMagNA refers to the recyclable magnetic nanoadsorbent in the form of coreshell nanoparticles within the size range between 250-500 nm. This coreshell nanoadsorbent consist of magnetite (Fe ₃ O ₄) nanoparticles as a core. The magnetite itself can act as an adsorbent for the removal of heavy metal ions or inorganic/organic materials during the waste water treatment. The functionality of this particles was enhanced by combining with silica (SiO ₂), silver chloride (AgCl) and silver (Ag) nanoparticles. Silica, other than acting as a shell for magnetite and surface deposition for AgCl and Ag, can also act as an adsorbent. Both Ag and AgCl function as inhibitor for the bacterial growth. Magnetite core also act as an 'achor' to direct the movement of ReMagNA under magnetic field, thus the nanoadsorbent composite can be collected at the end of the process ad reused. The ReMagNA have potential to be used for industrial waste-water treatment process. For example, in the removal of heavy metal ions and textiles waste (organic dyes).
Class no.	1

MY.5.

Title	A Novel Metal Epoxy Composite (MEC) as Mold Insert for Rapid Tooling Application
Authors	Ir. Ts. Radhwan Hussin, Prof. Ts. Dr. Safian Sharif, Assoc Prof. Ir. Dr. Shayfull Zamree Abd Rahim, Ts. Dr. Mohd Azlan Suhaimi and Dr. Mohd Tanwyn Mohd Khushairi.
Institution	Universiti Teknologi Malaysia and Universiti Malaysia Perlis.
Patent no.	PI201908377
Description EN	Metal Epoxy Composite (MEC) were fabricated into molding inserts for producing mechanical testing specimens of plastic material through injection molding process. The molding inserts consisted of cavity and core blocks which are CNC machined into specific dimensions of the tensile strength and Izod test specimens based on ASTM standards.

MEC inserts were assembled into the mold base as fixed and moving halves which were mounted on the plastic injection molding machine. Polypropylene was used as the specimen material and the simulated processing parameters from plastics flow analysis. After demolding, mechanical tests were conducted, in order to investigate the behavior of specimens obtained from all inserts as compared to specimens produced from conventional metal molds. This result confirmed that mold materials have different effect on the mechanical properties of the injected parts.

Class no.

5

MY.6.**Title**

Self-Supported Geopolymeric Membrane/Particles for Waste Water Treatment

Authors

Wan Mastura Wan Ibrahim, Romisuhani Ahmad, Mohd Mustafa Al Bakri Abdullah

Institution

Centre Of Excellence Geopolymer And Green Technology, School Of Materials Engineering, Universiti Malaysia Perlis (UniMAP)

Patent no.

US 8580029 B2

Description EN

The synthesis of inorganic membranes is very costly due to heat requirements in sintering and cost of raw materials. New technology of self-supported geopolymeric membranes through geosynthesis reaction that chemically integrates minerals that involves naturally occurring aluminosilicate sources to form 3D tetrahedral network. The geopolymeric membrane can survive in harsh corrosive environment such as high produced water treatment. Additions of foaming agents increased the porosity and consequently the permeate flux with a reasonable compressive strength.

The applications of geopolymeric membrane focusing on waste water treatment

Class no.

1

MY.07.**Title**

HY-HAp : A novel technique to produce low sintering temperature hydroxyapatite (HAp) for medical and dental application

INTERNATIONAL EXHIBITS

Authors	Wan Mohd Arif W. Ibrahim, Mohd. Mustafa Albakri Abdullah, Mohd Arif Anuar Mohd Salleh, Hasmaliza Mohamad, Faizul Che Pa, Noorina Hidayu Jamil, Nur Atirah Mohd Sukri
Institution	Center of Excellence Geopolymer and Green Technology (CEGeoGTech), Universiti Malaysia Perlis (UniMAP)
Patent no.	N/A
Description EN	<p>HY-HAp is a hybrid hydroxyapatite product that is fabricated from alkaline activation technique. Hydroxyapatite (HAp) is commonly use in biomaterial applications because of their chemical similarity to inorganic mineral component of bones and teeth. Beside that HAp bioceramics with the least dissolution are the most stable phase.</p> <p>In order to apply these conventional bioceramic, the HAp need to be prepared and treated at high temperature ranging from 1200 °C – 1300 °C, where, the manufacture require to consume high energy that directly increased the cost of manufacturing.</p> <p>HY-HAp, in other hand, benefits from the alkaline activation technique able to reduce the operating temperature up to 900 °C. Less energy usage and low manufacturing cost will be the ultimate choice for the biomedical industries.</p>
Class no.	4

MY.08.

Title	Algae Addfuel
Authors	Muhammad Fahim Danish Mohd Syairi, Muhammad Raziq Ruhaizan, Muhammad Nizamuddin Nazruddin, Muhammad Aniq Aiman Abdul Rahman, Nadia Zulkifli, Nurhazirah Ahmad, Nur Husna Mohd Fazli, Nurul Imaan Mohd Yazid, Alia Umairah Mohd Azmi, A'kiff Nur Na'im Norzamy, Imran Aziz
Institution	Tun Syed Sheh Shahabudin Science Secondary School
Patent no.	-
Description EN	The world continues to increase its energy use, brought about by an expanding population and a desire for a greater standard of living. This energy has led us to

reanalyze the potential of plant-based biofuels. Of the potential sources of biofuels the most efficient producers of biomass are the photosynthetic microalgae.

Algae can metabolize various waste streams and produce products with a wide variety of compositions and uses. Algae are fastest growing organisms for biomass production. Micro-algae contain more than 80% of lipids and fatty acids as membrane components, storage products, metabolites and sources of energy which can be processed into biodiesel. The discussion for potential of modern biotechnology to produce new algae strains that are easier to harvest. Algal oil can be used to make biodiesel for engine. The lipid and fatty acid contents of microalgae vary in accordance with culture conditions. Produce bio-fuels from algae, claiming enormous amounts of biomass that can be turned into liquid fuels at low cost.

The first objective of our project is to identify the basic fuel properties of the blended fuel which are fuel density, kinematic viscosity and calorific value. The second objective of this project is basically to investigate the emission characteristics such as CO, CO₂, NO_x and EGT of blended algae fuel in single cylinder diesel engine. Finally, the addition of algae oil in diesel fuel is aimed to be the next generation of fuel additive for current existing diesel fuel.

Class no.

2

MY.09.

Title

RECYCLE SPROUT PENCIL MAKER

Authors

Kayalvizhi Manivannan, Kirthika Ramalingam, Naavieena Rajaratnam, Sharvin Vasantha Kumar

Institution

TMP LITTLE SCIENTIST CLUB

Patent no.

P12019001974

Description EN

The Project has been named as GREENCIL MAKER, as it strives to make pencils, The prime aim of this project is to increase the awareness of the recycling, following the governments footsteps in its objective to increase production in GREEN SECTOR TECHNOLOGY. Our aim is to develop a low cost Green pencil maker, There are a lot of similar projects, but we differentiate

INTERNATIONAL EXHIBITS

ourselves by making it simpler and coupling it with renewable energy. We have thrived all through the project to tilt it towards the green technology wherever possible. with, Sprouts at the pencils end.

5

Class no.

MY.10.

Title

Smart HYDROBOT: Transforming Bottles for Hydroponics (Domestic Hydroponic using Harvested Rainwater with Smart Monitoring System)

Authors

Vasanthakumari Subramaniam, Harrish Dhinakaran, Mahaperummal Singkaravel, Vidhiya Sri Paranthaman, Sarvina Thayalan, Aesvan Arvind

Institution

SJKT Subramaniya Barathee

Patent no.

Pending Application

Description EN

This project has utilized used plastic drinking water bottles to build the hydroponic model. Furthermore, a rain water harvesting system was incorporated to the hydroponic system to reduce the water usage. The The system is fitted with sensors to monitor the water level and water flow. A light sensor is used to automate the LED light.

The model integrates IR4.0 into farming and fulfills the 3Rs in which it reduces clean water usage, reuses plastic drinking water bottles and recycles the nutrient rich rainwater. Since the cost is comparably minimum, the model can be used domestically and will promote agriculture at home.

Class no.

3

MY.11.

Title

Smart Curriculum Studies: Case-Based Learning

Authors

Assoc. Prof. Dr. Nurulwahida Aziz @ Aziz

Institution

**School of Education and Modern Languages
Universiti Utara Malaysia**

Patent no.

COPYRIGHT NUMBER: LY2019004773

Description EN

Smart Curriculum Studies Case-Based Learning (SCSCBL) is designed and developed using the Adobe flash CS6 script which is the pedagogical tool to stimulate critical thinking among master students comprising in-service and pre-service teachers. The

purpose of developing an interactive application is to enhance learning in curriculum studies course and at the same time to promote critical thinking through case-based learning strategy. Multimedia elements integrated in this app are text, graphics, audio, and video animation to make SCSCBL more interactive, engaging and user friendly. There are 5 topics covered in curriculum studies which are chosen based on the difficulty of the students' understanding of these topics before SCSCBL is developed. Each topic contains circle of constructive alignment model starting with (i) learning outcomes, (ii) learning content, (iii) learning activities (case-based learning strategy) and (iv) assessment (automatic scoring for correct answer). The uniqueness of this interactive application is not just pedagogical tool but more than that which is the creation of mini cases for each topic and the task of learning activities is related to the case to be solved by students using analytical, creative and practical thinking. The 5 topics were covered in 8 learning sessions from the overall 12 learning sessions per semester. The five topics are: (i) Curriculum Design, Development and Change, (ii) Curriculum Implementation, (iii) Curriculum Evaluation, (iv) Curriculum Value Orientations and (v) Curriculum Theories and Orientations. The application has undergone experts' validation in term of face validity, content validity and the appropriateness of multimedia category for instance font, color, interface, animation, audio, video and navigation

Class no.

14

MY.12.**Title**

CRE-WRAP

Authors

Siti Maslinda Bt Syed Musa, Wan Nurliyana Balqis Bt Zuraimi, Ambreen Thurayya Binti Ahmad Fahmi Yahya, Nurul Afifah Bt Mohd Nor Haffiz, Dian Nurfarhah Bt Hisammuddin, Ainna Husna Bt Abd Halim, Azwa Safrina Bt Zuraimi, Nurin Batrisyia Bt Yusri, Nurul Izzah Insyirah Bt Mohd Firdaus, Deepika Damodaran Nair, Kavipriya a/p Balasupramaniam, Almas Nadhirah Binti Ahmad Fahmi Yahya, Ruzayqah

INTERNATIONAL EXHIBITS

Institution	Binti Mohd Ghazali, Nurul Areesya Mohd Nor Haffiz, Hani Natasha Bt Zulkifli, Wan Marissa Fadhal Bt Wan Fadhlán, Hamidah Bt Mukhtar, Habibah Bt Jusoh, Mariam Bt Ahmad
Patent no.	SMK SAUJANA UTAMA -
Description EN	CRE – WRAP is a product that functions as a herbal bandage that is aimed treat commonly problems like sprained ankles and bruises. What differentiates CRE-WRAP compared to other products in the market is the ability to have anti-inflammatory properties. This idea was sparked when we saw a victim had sprained her ankle and healed considerably well after being applied a leaf called “Pokok Tembaga Suasá”. Experiments were conducted to innovate the conventional bandage and make it better. Using this plant, the bandage acts as a method to reduce swelling and provides adequate protection to avoid set spot from any foreign bacteria. Innovation of the bandage gives it a commercial value to further boost the marketability of this product. Appliance of green technology in the making of this product, it creates a safe and effective solution for common problem. The product is also an eco-friendly solution to sprained ankles and bruises as it is herbal - based with the aim to provide relief to the consumers.
Class no.	4

MY.13.

Title	NEEM AZALAENA HERBAL CARE
Authors	Siti Maslinda Bt Syed Musa, Wan Nurliyana Balqis Bt Zuraimi, Ambreen Thurayya Binti Ahmad Fahmi Yahya, Nurul Afifah Bt Mohd Nor Haffiz, Dian Nurfarhah Bt Hisammuddin, Ainna Husna Bt Abd Halim, Azwa Safrina Bt Zuraimi, Nurin Batrisyia Bt Yusri, Nurul Izzah Insyirah Bt Mohd Firdaus, Deepika Damodaran Nair, Kavipriya a/p Balasupramaniam, Almas Nadhirah Binti Ahmad Fahmi Yahya, Ruzayqah Binti Mohd Ghazali, Nurul Areesya Mohd Nor Haffiz, Wan Marissa Fadhal Bt Wan Fadhlán, Normahizan Bt Abdullah, Siti Mariam Bt Che Omar, Tanty Bt Sharum
Institution	SMK SAUJANA UTAMA
Patent no.	-

Description EN	<p>NEEM AZALAENA HERBAL CARE is aimed to tackle the ever growing demand for safe and well-researched cosmetic products. It is a user-friendly and herbal-based product. Formed in various shapes and types to fit the user's needs, it is produced in two mediums, liquid and powder. It is applicable in beauty care treatments. Comes in various form and is tailored to the customer's preference, it is a cosmetic product with healing properties. We use our school distillation apparatus into our extracting activities which allow us to apply the concept of biochemistry using the concept of water distillation. The use of herbal knowledge has led us to conduct an experiment, the beginning of extraction activities. The medicinal plants used are ' Pokok Kapal Terbang'. It grows in large quantities which makes it easily accessible. Our research has also sent to University Putra Malaysia (UPM) to be analysed and the results had shown a positive . This shows that the innovation of the method of extraction is valid as well as applicable towards extracting the essential oils from plants.</p>
Class no.	4

MY.14.**Title****STROFLOOR****Authors**

Siti Maslinda Bt Syed Musa, Mohamad Ihsan B Mohd Ismail, Norelmeza bt Marjonid, Wan Nurliyana Balqis Bt Zuraimi, Ambreen Thurayya Binti Ahmad Fahmi Yahya, Nurul Afifah Bt Mohd Nor Haffiz, Dian Nurfarhah Bt Hisammuddin, Ainna Husna Bt Abd Halim, Azwa Safrina Bt Zuraimi, Nurin Batrisyia Bt Yusri, Nurul Izzah Insyirah Bt Mohd Firdaus, Deepika Damodaran Nair, Kavipriya A/P Balasupramaniam, Almas Nadhirah Binti Ahmad Fahmi Yahya, Ruzayqah Binti Mohd Ghazali, Nurul Areesya Mohd Nor Haffiz, Wan Marissa Fadhal Bt Wan Fadhlán

Institution

SMK SAUJANA UTAMA

Patent no.

-

Description EN

STROFLOOR is a product that is aimed to solve a problem which is prevalent in most Malaysian schools. Strofloor is a flooring material which is strong and durable. It can be applied to the floors of any buildings

or as a base for tiles. The main compound of STROFLOOR derives from natural sources such as plants and recyclables. The use of herbal knowledge has led us to conduct an experiment to further innovate the age-old-creation, the concrete. Broken cement has become a common issue in our school that has raised much concern in terms of the safety of the entire school community. Besides, many problems have also arisen from the process of gaining cement that poses a threat to nature such as pollution and habitat loss. Therefore, this product is invented as a solution to tackle those problems and to find alternatives for cement as to reduce the damage that it generally causes. Simultaneously this product will develop a nation that applies green technology as an eco-friendly option and reduces the carbon release rates to the atmosphere.

Class no.

4

MY.15.**Title**

Low Energy Latex Modified Asphalt Mixture via Foaming Technique

Authors

Mohd Rosli Mohd Hasan, Hainian Wang, Sharvin Poovaneshvaran, Muhammad Khuzaimi Aziz, Guo Tai, Khairul Anuar Shariff

Institution

**Universiti Sains Malaysia (USM), Malaysia
Chang'an University, China**

Patent no.

-

Description EN

Incorporation of latex in road construction has gained the interest of Malaysian government as it helps the rubber industry. The elastomeric properties of latex cause the binder to be stiffer and require higher mixing temperature for the asphalt mixture production than the conventional asphalt. The increment of temperature in asphalt mixture production releases more greenhouse gases that endanger the environment and human health. In order to overcome the high production temperature in asphalt mix incorporated latex, an innovative foaming agent using diluted methanol with the incorporation of natural rubber latex has been initiated. Diluted methanol vaporizes at low boiling temperature helps in lowering

the viscosity of the rubberized modified bitumen hence improve the service characteristics at lower production temperature. Moreover, diluted methanol prevents the latex from coagulate.

Class no.

7

MY.16.

Title

Dr Siphon: Removal Sediment in Water Reservoir

Authors

Mohd Remy Rozainy Mohd Arif Zainol, Pingping LUO, Jazaul Ikhsan, Zainordin Firdaus Zulkefli, Mohamad Amirol Mohd Yusof, Muhammad Nasri Nasehir Khan, Muhammad Luqman Mohd Fadzil

Institution

Universiti Sains Malaysia (USM)

Patent no.

-

Description EN

Water is the natural resources uses for multi-functional for human purpose. Water reservoir is the main structure to supply and distribute water to the communities. According from International Commission on Large Dam (ICOLD), world water storage near the reservoir decreases caused by sedimentation. Sedimentation also can damage the reservoir structure (dam), damage the turbine propeller, capacity of electricity decrease and contribute to major flood events. The objectives of Dr Siphon had been design are to remove sediment in water reservoir, to improve the suction characteristics and to produce method of sediment removal with low cost and maintenance operation by implemented green and sustainable method.

Dr Siphon had a capability to transport coarse sand (44.7%), medium sand (39.6%), fine sand (15.5%), coarse silt and fine gravel with total of (0.25%). Dr Siphon will start suction automatically when water flow in the system and the suction operation will cut off when water reservoir level is at 20% from the reservoir bed. The operation of Dr Siphon can be operated without electric supply and pump operation. Dr Siphon not only can be used in water reservoir, but it can be used near the pump sump and agricultural drainage system to remove sediment.

Class no.

2

Morocco

Represented by OFEED

MA.1.

Title

Micro Hydro-Aeolian Production for a Positive Energy Building

Authors

ELBHIRI Brahim, SALBI Adil, MERZOUK Safae, CHARADI Essadik

Institution

EMSI Group

Patent no.

Patent application No. **48426/2020**

Description EN

The project aims to develop an innovative concept for managing a decentralized micro production of electrical energy within a building. The main objective of this project is to bring to zero the energy bill for this building (residential, tertiary or industrial), which will be qualified as a positive energy building. The originality of this work lies in the operation of micro hydro-wind turbines installed within the building's wastewater and rainwater drainage pipes.

Class no.

2

MA.2.

Title

A Smart micro-wind system for an auxiliary electrical energy production

Authors

Elbhiri Brahim, Salbi Adil, Merzouk Safae, Charadi Ssadik

Institution

EMSI Group

Patent no.

Patent application No. **46983/2019**

Description EN

Today, the green energies production presents an inevitable solution for the sustainability, the environment protection and others. The project contributes in the world of renewable energies through the development of a smart solution allowing the production of electrical energy using micro-turbine systems. These are placed on vertical or horizontal supports in the well-chosen areas in the highways or others related to micro- wind turbines. These micro-turbines produce de electrical energy using the effect of a wind energy source generated by the engine movement. This global project integrating an intelligent managing system will be considered as an important

EUROINVENT 2020

solution to produce energy for Rest areas, BTS, Cameras, Traffic signalizations, weather stations, electric vehicle charging station or others.

Class no.

2

MA.3.

Title

An Intelligent, Efficient and Digital Hospital Management Ecosystem

Authors

Mohamed Tabaa, Mariam Chehmat

Institution

EMSI Group

Patent no.

Patent application No. 46144/2019

Description EN

This current invention concerns an intelligent hospital management ecosystem for a critical patient based on embedded equipment, massive storage platforms and embedded intelligence for better decision making. The solution proposed in this invention combines collection, communication, storage, and remote processing and decision making in real time for a critical case. It eventually allows the follow-up of the patient with the creation of an efficient and secure digital medical record, which promotes exchanges, archiving and medical syntheses for a better access to complete and accurate information through the patient's attending doctor or the health institution monitoring the patient's condition.. It makes a significant contribution to improving patient safety and quality of care while increasing efficiency and improving the day-to-day operations of a doctor or health care institution.

Class no.

4

Moldova

Botanical Garden of Academy of Science Republic Moldova

MD.1.	
Title	The new cultivar „<i>ILEANA</i>” of Elecampane, <i>Inula helenium</i> L.
Authors	Dr. Victor ȚÎȚEI
Institution	“Alexandru Ciubotaru” National Botanical Garden (Institute), Chisinau
Patent no.	20190007/2019.02.19 AGEPI Moldova
Description EN	<p>The cultivar „<i>Ileana</i>” of elecampane, <i>Inula helenium</i> L., <i>Asteraceae</i> family, is highly frost-tolerant perennial crop, plant height 200-220 cm, it suitable to be cultivated on marginal and wet lands, annual productivity reached 50 t/ha of green mass or 9-13 t/ha dry matter.</p> <p>Multi-purpose crops: fodder for animals (silage and vitaminized flour) and for honeybees, biomass for renewable energy production, pharmaceuticals and technical products. The fodder values of the prepared silage: 124.9 g/kg protein, 33.3 g/kg fats, 305 g/kg raw cellulose, 398 g/kg nitrogen-free extractive substances, 139 g/kg ash, 18.1 g/kg lactic acid, 3.9 g/kg acetic acid, 104 g digestible protein/ nutritive units. This cultivar is a source of pollen and nectar available for 30-42 days (July-August), and makes it possible to obtain 70-130 kg/ha of honey.</p> <p>The specific density of the densified biofuel (briquettes) reached 800 kg/m³ with gross calorific value 18.5 MJ/kg and the amount of ash 2.6%, stoichiometric gas production potential from silage substrates 440 L/kg VS with 53.8 % methane content.</p> <p>The rhizomes (<i>Radix Inulae</i>) contain 42% inulin and 9% other carbohydrates, as well as essential oils, which are necessary for the preparation of various pharmaceutical products, the aromatization of soft drinks, some wines and pastries.</p>
Class no.	2-3

MD.2.	
Title	The new cultivar „VIGOR” of milkvetch,
Authors	<i>Astragalus galegiformis</i> L.
Institution	Dr. Victor ȚÎȚEI
Patent no.	“Alexandru Ciubotaru” National Botanical Garden (Institute), Chisinau
	20190006/2019.02.19 AGEPI Moldova
Description EN	<p>The cultivar „<i>Vigor</i>” of milkvetch, <i>Astragalus galegiformis</i> L., <i>Fabaceae</i> family, is highly growth and development rate perennial crop, suitable for the phyto-amelioration and the valorification of marginal, eroded and polluted lands. In the flowering stage (middle May), it grows about 165-175 cm tall, the productivity (2-3 cuts per season) is 55-70 t/ha green mass with 49-57% leaves. The nutritive value of the green mass (1-st cut): 23.4% crude protein, 24.8% ADF, 40.1% NDF, 3.1% ADL, 12.6% ash, 18.8 % total soluble sugars, 16.1 % hemicellulose and 21.7% cellulose, with 87.5 % digestible dry matter, 87.5 % organic digestible matter, relative feed value 161 with 11.1 MJ/kg metabolizable energy and 7.18 MJ/kg net energy for lactation.</p> <p>The biochemical methane potential of the green mass substrates reached 370 L /kg VS, the densified biofuel (briquettes) from the stems after harvesting the seeds reached 810-848 kg/m³ specific density with gross calorific value 18.1-18.8 MJ/kg and 1.5-2.3% ash.</p> <p>This cultivar is a source of pollen and nectar for bees that makes it possible to obtain 90-100 kg/ha of honey, for the pharmaceutical industry, it may be a source of flavonoids and glycosides.</p>
Class no.	3

The Institute of Physiology and Sanocreatology

MD.3.	
Title	Method for stimulating spermatogenesis in rabbits
Authors	Boronciuc Gheorghe, Balan Ion, Cazacov Iulia, Rosca Nicolae, Bucarciuc Melania, Buzan Vladimir, Mereuta Ion, Dubalari Alexandru, Fiodorov Nicolae, Blindu Irina
Institution	Institute of Physiology and Sanocreatology
Patent no.	MD 1343
Description	The invention related to veterinary medicine, in particular to the reproduction of farm animals and can be used to stimulate spermatogenesis in rabbits.
EN	The method for stimulating spermatogenesis in rabbits consists in administering to rabbits <i>per os</i> a solution containing 2mg/ml of copper sulfate pentahydrate, 1ml per animal once a day, for 40 days. The use of proposed method provides increased mobility and concentration of gametes, absolute survival index and morfofunctional integrity of reproductive cells.
Class no.	3

MD.4.	
Title	Biologically active food supplement
Authors	Mereuta Ion, Strutinsky Tudor, Caraus Vladimir
Institution	Institute of Physiology and Sanocreatology
Patent no.	MD 1385
Description	Biologically active food supplement according to an invention, which contains amaranth seed flour, dark grape seeds, white acacia and Italian immortelle pollen. Food supplement can be recommended as a prophylactic agent or can be included in the functional food structure, which is intended to optimize the protein metabolism, also to increase the antioxidant and adaptive potential of the organism. It possesses anticarcinogenic activity. The components of the developed biologically active food supplement are ecologically clean, accessible.
EN	
Class no.	3

MD.5.

Title **Biologically active food supplement**
Authors **Strutinsky Tudor, Mereuta Ion, Caraus Vladimir**
Institution **Institute of Physiology and Sanocreatology**
Patent no. MD 1386

Description
EN

Biologically active food supplement according to an invention, which contains amaranth seed flour, dark grape seeds, nutmeg, white acacia pollen and basis of natural vegetable sources. Food supplement can be recommended as a prophylactic agent or can be included in the functional food structure, which is intended to optimize the protein metabolism and also to increase the antioxidant and adaptive potential of the organism. It possesses anticarcinogenic and oncoprotective action. The components of the developed biologically active food supplement are ecologically clean, accessible.

Class no.

3

Technical University of Moldova

MD.6.

Title **Generation of precessional gearing with convex-concave contact**

Authors Maxim Vaculenco, Serghei Scaticailov, Sergiu Mazuru, Viorel Bostan, Ion Bostan

Institution **Technical University of Moldova**

Patent no.

Mechanical transmission consumers impose more and more demands on increasing the energy efficiency and their load bearing capacity. If about 80% of the global energy is transmitted to the drive mechanisms of the machines through mechanical transmissions, then the increase of their mechanical efficiency by only 1% leads to the saving of 0.8% of the energy produced on a global scale.

Description
EN

The development of the robotics and mechanical systems with compactness restrictions impose to the gear ever more stringent requirements regarding the mass and gauges, the quality of the gear material, the technological efficiency measured during the manufacturing operations, the cost of production, etc.

These requirements taken as a whole lead to the need to diversify and modernize the toothed gears A^D in the form of the tooth contact of the gear geometry and toothed wheels manufacturing technology.

These requirements can largely be met by precessional transmissions with a new toothed gear concept with „congruent” concave-concave contact.

Class no.

MD.7.

Title **Unconventional digital gear manufacturing technologies with non-standardized profiles from precessional transmissions**

Authors Viorel Bostan, Ion Bostan, Vareriu Dulgheru, Rodion Ciupercă, Sergiu Mazuru, Alexei Toca, Maxim Vaculenco, Ion Bodnariuc, Ciobanu Radu, Ciobanu Oleg, Nicolae Trifan, Iulian Malcoci, Ion Dicusară, Dumitru Vengher, Alexandru Buga, Alina Bregnova

INTERNATIONAL EXHIBITS

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

The success of the competition in which the producers of new industrial products are engaged is based on the time consumed in the activities of designing, making prototypes, testing and putting them into manufacturing. The main performance factors in the development of a new product are the reduction of the time and the costs of carrying out all the steps prior to its launch on the market.

Description
EN

The research field refers to the technological development of precessional transmissions.

The time and costs of achieving the precessional transmissions mostly refer to the manufacture of central wheels with non-standard convex-concave profiles and to the satellites with circular arch profiles of the teeth.

These objectives were achieved by developing unconventional technologies based on digital manufacturing.

Class no.

MD.8.

Title **Aerodynamic wind rotor with vertical axis with variable angle of attack**

Authors Viorel Bostan, Ion Bostan, Valeriu Dulgheru, Rodion Ciupercă, Maxim Vaculenco, Marin Guțu, Radu Ciobanu, Oleg Ciobanu, Valeriu Odainîi, Vitalie Glădăș, Ion Rabei, Andrei Platon

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

The field of research refers to the creation of wind energy conversion devices, namely to the wind turbines with vertical axis.

Description
EN The wind turbine with vertical axis includes a tower on which a rotary shaft with blades with an inclined aerodynamic profile is installed, the ends of which by means of V-class kinematic couplings are coupled with a rotary shaft connected to the permanent magnet generator.

The V-class kinematic couplings have a common axis and ensure the variation of the angle of attack depending on the speed of the air flow in automatic mode.

Class no.

MD.9.**Title**

Micromotors driven by UV light based on advanced hybrid GaN/ZnO nanoarchitected microtubes

Authors

Vladimir CIOBANU, Mihail ENACHI, Tudor BRANISTE

Institution

Technical University of Moldova

Patent no.**Description
EN**

Functional microstructures with designed hierarchical and complex morphologies and large free active surfaces based on novel hybrid nanoarchitected GaN/ZnO microtubes with an outer hydrophobic GaN surface and an inner hydrophilic surface of chemically stabilized ZnO decorated by solid solution $(\text{Ga}_{1-x}\text{Zn}_x)(\text{N}_{1-x}\text{O}_x)$ NWs, which are terminated by co-catalyst AuGa-alloy nanodots have been developed and characterized. The presence of an epitaxially stabilized and chemically extremely stable ultrathin layer of ZnO on the inner wall of the produced GaN microtubes is evidenced. Gold nanoparticles initially trigger the catalytic growth of solid solution phase $(\text{Ga}_{1-x}\text{Zn}_x)(\text{N}_{1-x}\text{O}_x)$ nanowires into the interior space of the microtube, which are found to be terminated by AuGa-alloy nanodots coated in a shell of amorphous GaO_x species after the hydride vapor phase epitaxy process. As a proof of concept, the produced microtubes are used as photocatalytic micromotors in the presence of hydrogen peroxide solution with luminescent properties, which are appealing for future environmental applications and active matter fundamental studies. Our experiments show intense photocatalytic reactions under UV light excitation in the presence of hydrogen peroxide exclusively for microtubes functionalized with gold nanodots. It has been demonstrated that two microtubes with the lengths of 32 μm and 4.6 μm , and diameters of 2 μm and 0.9 μm , exhibit average velocities of UV-light driven motion of 1.4 $\mu\text{m/s}$ and 5.5 $\mu\text{m/s}$ with switchable on-off capability. The developed micromotors are promising for sensing applications, e.g., by monitoring the fluorescence quenching in the presence of a certain analyte, or environmental cleaning by the degradation of organic pollutants by photocatalytic reactions. This work received partial funding from the European Commission under the H2020 grant #810652 'NanoMedTwin' and state program Grant #20.80009.5007.20.

Class no.

MD.10.**Title**

Two-step cost-effective electrochemical technology for the preparation of free-standing perforated Au nanomembranes.

Authors

Eduard Monaico, Elena Monaico, Veaceslav Ursaki and Ion Tiginyanu

Institution

Technical University of Moldova, National Center for Materials Study and Testing

Patent no.**Description
EN**

Herein, we propose a room-temperature two-step cost-effective electrochemical technology for the preparation of free-standing Au nanomembranes. A thin Au film with thickness less than 100 nm was deposited by pulsed electroplating on a GaAs substrate wafer in the first step, while electrochemical etching was applied in the second technological step to introduce porosity into the GaAs substrate underneath the Au film. It was shown that detachment of the film from the substrate occurs at optimized parameters of anodic etching. Scanning electron microscopy imaging of the deposited Au film revealed its nanoparticulate structure generated via the mechanism of hopping electrodeposition, i.e. the film proved to consist of a monolayer of Au nanoparticles with the mean diameter around 20-30 nm. It was found that nanoholes with the diameter controlled by the duration of cathodic voltage pulses can be introduced into the Au film during electroplating. The purity of the detached Au nanomembranes was demonstrated by the energy dispersive X-ray analysis. The flexibility and stretchability, along with possibilities to transfer the prepared nanomembranes to various substrates are expected to be prospective for new optical, plasmonic and electronic applications.

This work received partial funding from the European Commission under the H2020 grant #810652 'NanoMedTwin' and state program Grant #20.80009.5007.20.

Class no.

MD.11.

Title	<p>Project title: NATO Science for Peace and Security Programme (SPS) under grant G5634 „Advanced Electro-Optical Chemical Sensors” AMOXES</p> <p>Research title: Facile Fabrication of Semiconducting Oxide Nanostructures by Direct Ink Writing of Readily Available Metal Microparticles and their application as Low Power Acetone Gas Sensors</p>
Authors Institution	<p>ABABII Nicolai, LUPAN Oleg.</p> <p>Technical University of Moldova</p>
Description EN	<p>In this work, a facile two step fabrication and characterization of 3D printed acetone sensors based on mixed semiconducting metal oxides is introduced. The devices are fabricated by Direct Ink Writing metal microparticle (MP) stripes of commercially available pure iron and copper particles onto the surface of a glass substrate, forming a bridging multi-phase semiconducting oxide net by subsequent thermal annealing. The open, highly porous bridging structures consist of heterojunctions which are interconnected via non-planar CuO/Cu₂O/Cu nanowires and Fe₂O₃/Fe nanospikes. Morphological, vibrational, chemical and structural studies were performed to investigate the contact-forming Fe₂O₃-CuO nanostructures on the surface of the MPs. The power consumption and the gas sensing properties showed selectivity to acetone vapor at an operating temperature of around 300 °C with a high gas response of about 50% and the lowest operating power of around 0.26 μW to a concentration of 100 ppm of acetone vapor. The advantages of this research are the combination of the possibility of acetone vapor detection, the controllable size and geometry and their low power make these 3D-printed structures important candidates for next developments of accessible detection devices, as well as acetone vapor monitoring (even below 1 ppm). The printing of MPs in general paves the way for a new generation of printed different devices, even in “home-made” conditions, for a manifold of applications tailored such as biomedical devices, portable electronic and sensor applications by the composition and geometry of the printed MP stripes, enabled through the simplicity and versatility of the fabrication method.</p>

Class no.

MD.12.**Title**

Obtaining and stabilizing dyes, antioxidants and preservatives of plant origin for functional foods

Authors

Ghendov-Mosanu Aliona

Institution

Technical University of Moldova

Patent no.**Description
EN**

The problem of functional foods with biologically active substances (BAS) of natural origin is very welcome by the food industry, especially considering that excessive use of synthetic dyes in food is may induce harmful effects on the consumers health. Replacing synthetic pigments with substances of natural origin obtained from agro-food industry waste is a strategic problem, because unlike synthetic dyes, the natural pigments are fragile molecules sensitive to light and storage conditions. At present, the agro-food industry waste accounts for about half of the total waste. The smart biorefinery procedures may offer solutions to use of agro-industrial waste and will allow the manufacture of a wide range of natural dyes and antioxidants with various applications, including for the food industry. At the same time, antiradical and bacteriostatic activity of these extracts rich in polyphenols, carotenoids, vitamins, etc., is a promising source of alternative solutions for their use to replace certain food preservatives of synthetic origin. The extraction and isolation of BAS from plant resources aims to preserve their functionality in improve their bioaccessibility and bioavailability. The overall objective of this project is to develop processes for obtaining and stabilizing colorants, antioxidants and preservatives of vegetable origin from horticultural sources and agro-food industry waste and their implementation in the food industry; intelligent valorisation of agro-industrial waste by using “green extraction” techniques (eco-extraction with non-pollutant reagents; applying a pulsed electric field, ultrasound and microwave treatment); extensioning the assortment of functional products from different fields of the food industry (bakery, pasta, confectionery, dairy products). The research results will contribute to the production of functional foods, able to lessen the impact of oxidative stress and nutritional allergies while helping to integrate the concept of health-generating food and to increase the commercial potential for the food industry.

Class no.

MD.13

Title	Elaboration and implementation of goat milk ice cream technology with increased nutritional and biological value at SRL Mellang&Compani
Authors	Bulgaru Viorica, Dudush Veaceslav
Institution	Technical University of Moldova
Description	<p>The project involves the study of the impact of the well-balanced goat's milk chemical composition (in order to solve the problem of the goat's milk valorization in the area) and of the nonlactic local raw materials (nuts, almonds, dried fruits), with high nutritional and biological value, on the particularities of the technology. Gelato manufacture and its implementation at the company Mellang & Compani SRL located in the Comrat city, UTA Gagauzia, became the first ice cream factory in this region, using the Italian technology and equipment. Fortifying ice cream with nutrients or other bioactive substances, with a positive impact on the quality of the end product and which can influence the consumer's ability to choose, is widely supported. The project proposes was to use of goat's milk as the main raw material in the gelato manufacture, due to its well-balanced chemical composition, high digestibility and nutritional, toning, anti-anemic and anti-infectious properties, which make it superior to cow's milk. In the Republic of Moldova there are about 900,000 heads of sheep and goats, of which more than 50% are raised in the south of the country (Gagauzia). At the moment in the Gagauzia there are about 17,000 goats, of which 90% are managed by private farmers in small businesses where the goats are grown naturally, without the intensive methods of breeding, so the milk obtained is a bio product. In addition to the goat's milk, it was proposed to increase the biological and nutritional value of ice cream by using dried fruit fillings, nuts and almonds harvested in the Republic of Moldova, due to the high intake of unsaturated fatty acids, proteins, vitamins and mineral salts. As a result of the project, it was the elaboration and implementation of 4 variants recipes for the goat milk gelato manufacture with dried fruits and spirulina. Described the particularities of the manufacturing technology and analyzed the quality of the end products through the organoleptic, physico-chemical, technological and microbiological indices.</p> <p>The results of the analyzed quality indices presented specific values for the manufactured product stipulated in the in force normative documents.</p>
EN	

Class no.

MD.14.

Title	Precessional transmissions with conform contact of the teeth in multi-pair gearing
Authors	Bostan Viorel, Bostan Ion, Vaculenco Maxim
Institution	Technical University of Moldova
Ptent	Application 6592, depozit a2019 0101, Data 2019.12.31 The invention relates to the mechanical engineering, namely to mechanical transmissions. The transmission comprises a body (1), a satellite wheel (2) with two bevel gear rings (3) and (4) driven by a crankshaft (5) in sphero-spatial motion around a fixed point, two central bevel wheels (6) and (7), one immobile 6 fixed in the body (1) and the other mobile (7) mounted on a driven shaft (8). The teeth of the gear rings (3) and (4) of the satellite wheel (2) have a circular arc flank profile, and of the central bevel wheels (6) and (7) variable curvilinear, depending on the angles θ and δ , on the number of Z teeth and the ratio of the numbers of teeth of the mating wheels in the gears (Z_1-Z_2) and (Z_3-Z_4) , as well as the radius r of the circular arc of the teeth profile of the gear rings (3) and (4). The configuration of the numerical values of the said parameters determines the geometry and the kinematics of the convex-concave contact of the teeth, the degree of frontal overlap, expressed by the number of simultaneously engaged pairs of teeth and defines the pressure angle between the mating flanks. The execution of the wheels with inclined teeth provides for the increase in the total contact line and the share of pure rolling of the teeth in gear due to their sphero-spatial interaction. The tooth gear is multipair, the teeth flanks mate in contacts with convex-concave geometry with minimal difference of curvatures and with reduced relative sliding velocity, and the active flanks interact with each other with small angles of mutual pressure. The technical result consists in increasing the load-bearing capacity and mechanical efficiency of the precessional gear by creating the multipair and convex-concave teeth contact with the minimum difference of curvatures of the flank profiles and with reduced relative frictional sliding between the flanks of the teeth, as well as in extending the kinematic possibilities and functionalities of the transmission. For the essential extension of the functional and kinematic possibilities, the transmission further comprises a mobile intermediate central wheel with two bevel gear rings each engaged with a gear ring of two satellite wheels, placed laterally and mounted on spherical supports symmetrical to their precession centers, being consecutively coupled to two cranks.
Description EN	
Class no.	5, 8

MD.15.

Title **Photovoltaic installation „SUNFLOWER”**
Authors *Bostan Ion, Bostan Viorel, Dulgheru Valeriu, Guțu Marin, Ciobanu Radu, Ciobanu Oleg (MD).*
Institution **Technical University of Moldova**
Patent no. *Patent application, nr.2010. 06.03.2020*

**Description
EN**

The „Sunflower” type photovoltaic installation refers to the photovoltaic solar energy conversion plants, is, to the photovoltaic installations with self-orientation in the southern and azimuthal plane.

The photovoltaic installation „Sunflower” includes the fixed tower (1) with the vertical openings 2, in which elements of concentration of the solar rays (3) are rigidly installed. Inside the tower 1 is installed the embossed tube (4) filled with gas with a high coefficient of expansion upon heating, the upper end of which is rigidly connected with the shaft (6). On the free cylindrical surface of the shaft (6) the inclined channel (8) is executed, in which the balls (9) are placed. On the inner cylindrical surface of the bush (10) are made spherical seats, in which the balls (9) are located and is connected to the rotary cylinder (13) with the unisense coupling (14). The rotating cylinder (13) is periodically connected by the arched ball (18) with the fixed tower (1). In the upper part the rotary cylinder (13) is rigidly connected to the support shaft (24), on which is installed the hinged photovoltaic panel (25). The bottom end of the photovoltaic panel (25) in the middle is connected by the bar (26) with the lid (27) rigidly connected to the fixed tower 1.

2. Energy and sustainable development.

MD.16.

Title **Aeolian-solar hybrid system for domestic water heating**
Authors *Bostan Ion, Bostan Viorel, Dulgheru Valeriu, Dumitrescu Cătălin, Dumitrescu Liliana,*
Institution **Technical University of Moldova**
Patent no. *Patent application, OSIM A/00579. 10.08.2018*

**Description
EN**

The invention relates to water heating systems, namely to heating water with wind and solar thermal energy. The problem that the invention solves is the widening of the technological possibilities, the increase of the conversion efficiency and the operational safety. The solar-wind hybrid system includes the solar thermal installation, the vertical-

axis wind turbine and the hot water accumulator. The wind turbine includes the aerodynamic blades rigidly connected to the main shaft which, in turn, is connected by the shaft coupling of the thermal generator with turbulent currents. The solar energy is converted into thermal energy by the solar thermal installation. Wind energy is transformed by the aerodynamic blades into rotational motion of the main axis that generates turbulent currents in the thermal generator and converts it into thermal energy. To protect the solar thermal system from overheating, the wind turbine includes a turbocharged brake.

Class no. 2. Energy and sustainable development.

MD.17

Title

Thermogazocyclic nitration process

Authors

Sergiu Mazuru, Nicolaie Trifan, Alexandru Mazuru

Institution

Technical University of Moldova

Patent no.

Cerere de brevet nr. a 2020 6614 din 24.02.2020

Description

EN

In order to increase the service life of the parts of the machine parts, of the most loaded ones, in the industry, the thermal and chemical-thermal hardening procedures are often used. Chemical-thermal treatment, increases hardness, wear resistance and corrosion. Forming in the superficial layer favorable compression stresses, which increase the reliability and service life of the machines. But this process has a number of shortcomings, the main disadvantage of the process is the high cost and the long duration of the process. At a temperature of 500 ° C, for example, every 10 hours the nitrogen diffuses into the iron at a depth of about 0.1 mm, so the total duration of the process is 30 ... 60 hours. A new efficient method of thermo-gas-cyclic nitriding is proposed. The new technology allows to reduce the consumption of saturated and emission gases in the atmosphere by about 10 times, the same time about 5 times the reduction of the process duration, as well as the increase of the diffusion layer thickness by 2-6 times, without reducing the physical and mechanical characteristics of the product.

Class no.

MD.18.

Title **Toothpick hardening device**

Authors Mazuru Alexandru, (MD); Trifan Nicolae, (MD); Mazuru Sergiu, (MD).

Institution **Technical University of Moldova**

Patent no. Cerere de brevet nr. a 2019 0095/2019.12.18

The invention relates to the processing of pressure metals and can be used to increase the bearing capacity of the teeth. Purpose of the invention - broadening the technological possibilities, simplifying the construction of the device. The device is composed of the mobile drive disk 1, the fixed body 2, on which the hardening mechanism 3 is mounted, movable installed on the perimeter of the rotating disk 4 on the central spindle 5 and is based on the body 2 by means of the balls 6. In the body 2 it is installed a block 7, which has a high pressure cavity 8, holes, which communicate with the cavities of the block 7, and the pistons 9 and 10. The pistons 9 and 10 contact on the one hand with the mobile drive disk 1 and on the other hand with the elements loading 3, forming with its front part and loading elements 3 spherical joints 11.

Class no.

MD.19.

Title **Wheel - satellite**

Authors Sergiu Mazuru, Lealin Stanislav, Maxim Vaculenco, Ion Bostan

Institution **Technical University of Moldova**

Patent no. Cerere de brevet nr. a 2018 0080 din 17.09.2018

The invention relates to the machine building industry and more correctly to the construction of toothed wheels with elastic-flexible teeth. The purpose of the invention is to design and manufacture gear and gear drives with increased load bearing capacity, increase-operating life (longevity) and reduce noise and vibration, while reducing the requirements for the precision of execution by ensuring the elastic flexibility of the gear elements, having and a simple toothed wheel technology. During operation precessional transmission wheel - satellite due to increased flexibility increases multiplicity of gear, which allows reduction of contact stresses, noise and vibration, allowing to extend the life of the mechanical transmission.

Description
EN

The manufacture of the satellite wheel is based on known technology that does not require additional equipment. The wheel-to-wheel design is based on known technology that does not require additional equipment.

Class no.

MD.20.

Title **Process for forming the micro-relay regularly on the surface of the gear teeth**

Authors Sergiu Mazuru, (MD); Maxim Vaculenco, (MD); Ion Bostan, (MD); Scaticailov Serghei, (MD);

Institution **Technical University of Moldova**

Patent no. brevet de invenție MD 374

Description
EN

The invention relates to the mechanical engineering technology, in particular to the machining of surfaces of gearwheel teeth of different metals and alloys operating in the lubricating medium. The process for the formation of a regular microrelief on the surface of the gearwheel teeth consists in that the tool in the form of a profiled on the edge disk with the radius R is communicated a motion that simulates the real operating conditions by movements coordinated about the mobile $X1Y1Z1$ and fixed XYZ coordinate systems. The tool is also communicated a linear motion along the gearwheel tooth, at an angle of $d \geq 0$ about the plane formed by the axes $X1$ and $Y1$. The gearwheel is communicated a rotary motion and ultrasonic vibrations modeled by the amplitude. The tool periodically comes in contact with the gearwheel, carrying out deformations on the surface of the teeth and forming a regular microrelief in the form of a grating of grooves with the necessary parameters along and by the depth of the tooth. The result of the invention consists in increasing the quality of the surface of the gearwheel teeth and providing the lubrication of the meshing zones with insufficient lubrication.

Class no.

MD.21.

Title **Scraper with vibromechanical drive**
Authors *Ciobanu Radu, Ciobanu Oleg, Botez Alexei, Malcoci Iulian, Dicusară Ion*
Institution **Technical University of Moldova**
Patent no. *Patent MD nr. 1422 Y, 29.02.2020*

The vibromechanical actuator has three assemblies: I - Electromagnet (actuator); II - Intermediate mechanism (transmission) III - Scraper mechanism (technological).

The electromagnet is installed on the battery housing, which contains the coil and the core rigidly assembled with the coil through the spiral spring. The rollers are mounted on the outer ends of the core, which can be moved on the guides. In the center of the core the pusher is fixed.

The intermediate (transmission) mechanism unites the electromagnet (drive) with the (technological) scraping mechanism. It is composed of the pipe (rigid or flexible) loaded with plastic balls for transmitting the force from the electromagnet core to the cutting tool and vice versa from the arc to the core. The pipe is fastened to the right side of the rigid pipe by means of the nut (3) and to the left side of the guide body.

The (technological) scraping mechanism is composed of the rigid pipe in which is installed the stiffened cutting tool with the spring tensioned stud. In the right side the spring is in solidarity with the rigid pipe with the help of the limiters fixed by means of the fixing screws, which at the same time limits the movement in the right of the spring.

Class no. 6. Mechanical Engineering - Metallurgy.

MD.22.

Title **DRYING INSTALLATION FOR GRANULAR PRODUCTS IN THE SUSPENSION LAYER**
Authors *Bernic Mircea, Țislinscaia Natalia, Balan Mihail, Vișanu Vitali, Melenciuc Mihail*
Institution **Technical University of Moldova**
Patent no. *MD 1278*

The invention relates to a drying process of granular products in a suspension layer, and can be applied to companies in the food industry that have a bearing on the drying process. The drying process of the granular products

in the suspension layer is provided by an installation, which according to the invention is composed of: housing 1 and a tube 6 composed of the upper area A, the middle areas B and C, and the lower area D. The housing is fixed control panel 3, which starts up inverter 2, fan 4 which sucks air through the filter 11 being driven by the motor 13, the lock 5 which is set according to the motor 12 and the magnetons 7 and 15. The fan 4 is mounted tube 6, to which the lock 5 is connected, to charge the product. Also on tube 6 are mounted reflectors 8 and 14, in which the magnetron 7 and 15 are incorporated. The passage of the product from zone C to zone B is provided by channel 16. At the top of tube 6 is mounted the outlet pipe 9 of the product, and cyclone 10.

The formulated problem is solved by the fact that the drying of granular products in a suspension layer is provided by a drying plant which is made up of a housing on which is mounted the control panel that starts up the locking power supply the product installation and the centrifugal fan that drives the product in a suspension layer due to a variable air flow, by adjusting the fan speeds using the inverter. Thus, the product from the lock arrives in the lower area of the tube, where it is driven vertically upwards by the fan. From the lower area of the tube, the product is found in two middle zones of it, whose value of the cross-section is greater than that of the lower and upper area. On the two middle areas of the tube are mounted a reflector and a magnetron which undergo the product of the drying process. In the given areas, the product is engaged in a compound movement, which covers all their height, due to the decrease of the linear speed in the section of the tube. Respectively when the mass of the product in the first middle zone begins to decrease due to the drying process, it is entrained in the second middle zone, where it is again subjected to the drying process, after which it is entrained at the top of the tube where the linear velocity is larger, due to the narrowing of the cross section. Thus the dry product is conveyed from the installation through the exhaust pipe, at the exit being separated from the air by the cyclone. This is an ongoing process.

Class no. 3. Agriculture and Food Industry

MD.23.

Title	Process for producing a functional curd cream
Authors	Ghendov-Moșanu Aliona, MD; Popescu Liliana, MD; Sturza Rodica, MD; Lungu Ildiko, RO; Opreș Ocsana-Ileana, RO; Soran Maria-Loredana, RO
Institution	Technical University of Moldova, MD
Patent no.	National Institute for Research and Development of Isotopic and Molecular Technologies INCDTIM Cluj-Napoca, RO
Description EN	MD 1290 Z 2019.06.30 The invention relates to the dairy industry, namely to a process for producing a functional curd cream. The process, according to the invention, comprises mixing the curds with a fat content of 0...5% with pasteurized cream with a fat content of 35...50% and salt, pasteurizing the mixture at a temperature of 72...77°C, adding a liposoluble extract of sea buckthorn or hips, or haws with concentration of carotenoids of 20...54 mg/L, 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 cream with a higher biological value, higher organoleptic indexes and an extended shelf life.
Class no.	3. Agriculture and Food Industry

MD.24.

Title	Adjustable optical attenuator for testing optical communication systems and networks
Authors	Țurcanu Dinu, Nistiriuc Pavel
Institution	Technical University of Moldova
Patent no.	MD 2110 G2 2003.02.28; MD 2464 G2 2004.05.31
Description EN	The invention relates to the field of optoelectronics and can be used to adjust the power level of the optical signal when adjusting and measuring the parameters of different medical and industrial optoelectronic devices, as well as in optical communication networks. For the optical attenuator adjustable based on the magnetic-rheological fluid, the attenuation is guided using the external magnetic field and the attenuation method is based on the use of plasma oscillations of the free electrons in iron, in the spectral range 0.4 ... 6.0 μm. The adjustable optical attenuator based on the magnetic-rheological fluid possesses the following characteristics: the attenuation range -2 ... - 50 dBm with the

resolution of -0,5 dBm; operates in the temperature range -45 ... + 75 0 C.

Class no. **10**

MD.25.

Title **Process for obtaining the CuO-Fe₂O₃ nanowire network**

Authors Ababii Nicolai; Postica Vasile; Trofim Viorel; Lupan Oleg.

Institution **Technical University of Moldova**

Patent no. Patent application entry number 1917, 2019

Description
EN

The invention relates to the technology for obtaining nanostructured materials, in particular to the technology for the production of nanowire networks by heat treatment in ambient temperature at 425 °C for 4 hours with the temperature rise rate in the furnace of 40 °C/min, which can be applied to the manufacture of gas sensors obtaining the ~120% acetone response at the concentration of 100 ppm in air and the operating temperature of only 200 °C. The portable devices based on such nanowire networks can accurately track breath acetone concentration, which is a selective breath marker for diabetes and has the potential for non-invasive diagnosis and painless monitoring of diabetes (no finger pricking), and thus simplify the management of this illness. The elaborated nanotechnology, being inexpensive to manufacture, may truly revolutionize personalized medicine and health care.

Class no. 4. Medicine - Health Care - Cosmetics

MD.26.

Title **The deposition process of ZnO films doped with Eu and functionalized with Pd**

Authors Lupan Cristian; Trofim Viorel.

Institution **Technical University of Moldova**

Patent no. Patent application entry number 1974, 2019

Description
EN

The invention relates to the technology for deposition of semiconductor oxide films, in particular to the process of obtaining of ZnO:Eu³⁺ films, with application of rapid thermal annealing (T=650 °C, t=60s), with can be applied to the manufacture of gas sensors obtaining sensibility $S = I_{\text{gas}}/I_{\text{air}} = 1.3$ for 100 ppm H₂ gas at room temperature and $S = I_{\text{gas}}/I_{\text{air}} = 118$ at operating temperature of 250 °C.

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

MD.27.

Title Device and method for measuring the resistance of a sensor based on nanostructured semiconductor oxides in the range of the order of microwatts Web: <http://utm.md/>

Authors VERJBIȚKI Valeri, LUPAN Oleg, RAILEAN Serghei

Institution Technical University of Moldova

Patent no. Patent number MD 1269 Z, 2018.07.31

Description *The device comprises an adjustable reference voltage source connected to the output of a microcontroller and connected in series to the investigated nanostructured sensor and to the reference resistor, the connection point of which to the investigated sensor is connected to the input of the microcontroller.*

EN *The method consists in: measuring the voltage of the reference voltage source, measuring the voltage drop across the reference resistor, calculating the voltage drop across the investigated nanostructure. Current flowing through the nanostructure and the applied power to the nanostructure are calculated and it is set the value of the reference voltage so that the electrical power will not exceed the maximum permitted value.*

Class no.

1. Environment - Pollution Control

MD.28.

Title Intelligent Waste Sorting System

Authors ROȘCA Neonil, LUNGU Iulian, SUDACEVSCHI Viorica, ABABII Victor

Institution Technical University of Moldova

Patent no. -

Description The project is in the field of ecology and environmental protection, in particular it concerns to the methods and technologies for industrial and managerial waste sorting. The project represents a compact and autonomous system for managerial and industrial waste sorting based on waste physical properties. The scientific concept of the applied method is based on Artificial Intelligence models with self-learning properties. The technological concept is based on the automatic movement of the waste on a conveyor, the analysis of physical properties and waste sorting in ferrous and non-ferrous metals, plastic, glass and paper.

EN

For the realization of the project, the mathematical model was proposed and intelligent algorithms were developed for waste sorting, implemented in a functional prototype.

Class no.

1. Environment – Pollution Control

MD.29.

Title

Innovative clothes solutions for children with special needs

Authors

Victoria Danila, Antonela Curteza, Stela Balan

Institution

Technical University of Moldova
Technical University „Gh. Asachi” Iasi

Patent no.

nr. 3888 WIPO85916, DM/203338

Description EN

The novelty of children's clothing consists in the development of original products that are adaptable with innovative solutions that meet their special requirements. Generalization of a number of constructive and technical solutions for which they provide functions in relation to specific needs: action on the provision of emergency medical care. The product is easy to dressed and undressed. The products of clothing are projected to small caps and are designed for ease of access to medical devices.

Model overalls with long sleeves, for newborn girls and boys with weight up to 2 kg. The product is the straight silhouette, white. Access to medical devices is above the waist line, the hands, feet, the closure system is located on the top of the shoulder line, and on the trouser termination line. The materials are 100% cotton, non-allergic.

Class no.

14

MD.30.

Title

FURNITURE FOR CHILDREN CREATION WORKSHOP

Authors

Maria Bernic, Mihail Stamati

Institution

Technical University of Moldova

Patent no.

Patent application

Description EN

Disassembled multifunctional furniture, created from modern ecological materials, intended for creative places in kindergartens, primary classes, apartments, etc.

The set of furniture includes: a table, a chair and a hanger

Applications: arranged places for children's creation.

Class no.

14 Other (Industrial design)

MD.31.

Title **FURNITURE PIECES FOR THE PARK**
Authors Mircea Zubcu, Valeriu Podborschi
Institution **Technical University of Moldova**
Patent no. Patent application
 Bench and waste basket, designed in a minimalist style from recyclable materials, intended for public outdoor places, with minimal impact to the soil in the assembly area.
Description Applications: Public parks, recreational spaces, etc..
EN
 Class no. 14 Other (Industrial design)

MD.32.

Title **Design Concept ELECTRIC CAR**
Authors Bogdan Edinac, Valeriu Podborschi
Institution **Technical University of Moldova**
Patent no. Patent application
 Concept of individual urban transport (two persons), powered by a set of environmentally friendly electric motors, dedicated to young people, rental networks of means of transport with the purpose of reducing environmental pollution and to improve the existing urban
Description Applications: individual urban transport.
EN
 Class no. 14 Other (Industrial design)

MD.33.

Title **KITCHEN ACCESSORIES FOR BLIND**
Authors Sergiu Guzun, Valeriu Podborschi
Institution **Technical University of Moldova**
Patent no. Patent application
 Accessories applicable to existing types of dishes, in order to facilitate the spatial orientation of the visually impaired.
Description Applications: kitchens, canteens, asylums for the elderly,
EN hospices, etc.
 Class no. 14 Other (Industrial design)

MD.34.

Title	MARTISORUL from tradition to modern
Authors	Marina Malcoci, Maria Eudochia Malcoci
Institution	Technical University of Moldova
Patent no.	MD nr. de depozit f 2019 0083, data de depozit 13.112019
Description EN	<p>The <i>mărțișor</i> are handmade. Different materials were used to make them: natural leather, red and white ribbon, thread etc. The immaculate white of <i>mărțișor</i> it brings purity, and red is a sign of love and luck. The martyr joins people through his rituals and superstitions; it allows the education of generations in the spirit of the good and the perennially of the tradition. It is worn and celebrated at the beginning of spring. The martyr is included in the Representative List of the cultural heritage of humanity, which is a moment of pride for those who wear it.</p>

Class no.

14

"N.Testemiteanu"
State Medical and Pharmaceutical University

MD.35.**Title**

Method for differential diagnosis of rotavirus infection based on metabolic acidosis in infants

Authors

ALSALIEM Tatiana MD, DONOS Ala MD, TAGADIUC Olga MD, REVENCO Ninel MD, SPÎNU Constantin MD, ILIEV Albina – Mihaela MD

Institution

Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova

Patent no.

MD 1389, 11/2019

**Description
EN**

The invention relates to medicine, especially to pediatrics and can be used for the differential diagnosis of rotaviral infection based on metabolic acidosis in infants.

The essence of the invention is that the clinical examination is carried out with the determination of metabolic acidosis, blood is collected from the radial artery in heparinized syringes, the level of Na⁺ and K⁺ cations, the HCO₃⁻ and Cl⁻ anions are determined, and the anion gap is determined according to the Na⁺ formula. + K⁺ - (Cl⁻ + HCO₃⁻). If a metabolic acidosis with an anionic gap greater than 12 mEq / l is determined, the presence of rotavirus infection is diagnosed, and if a metabolic acidosis with an anionic gap of less than 12 mEq / l is determined, a homeostasis disorder caused by a pathology of another genesis.

The proposed method is a simple, fast, inexpensive and accessible calculation, which allows the quantitative assessment of the non-measurable ions. The method of calculating the anion deficiency was used in two study groups: group I-infants with GEA(acute gastroenteritis) of unvaccinated rotaviral etiology and group II-infants with GEA of other etiology vaccinated against rotaviral infection (fig. 1).

Fields of application: medicine, pediatrics.

Class no.

4

MD.36.

Title Method for endoscopic hemostasis of cirrhotic variceal bleeding

Authors ANGHELICI Gheorghe; PANICI Ion; PISARENCO Sergiu; CRUDU Oleg; ZUGRAV Tatiana; LUPU Gheorghe.

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

Patent no. MD- 1425

Description EN The invention relates to medicine, in particular to endoscopic hemostasis of bleeding from esophagogastric varicose veins in liver cirrhosis. Summary of the invention consists in the introduction into the lumen of the bleeding varicose veins of a fibrin adhesive, containing a fibrinogen solution, which is mixed with aprotinin, thrombin and calcium chloride solutions in the following component ratio in 1 ml: fibrinogen sol. (mg) 15...30 aprotinin sol. (KIU) 250...1000 thrombin sol. (IU) 25...100 calcium chloride sol. (μ mol) 15...30, where thrombin is dissolved in 5...20 ml of metronidazole solution with a concentration of 5 mg/ml, to which are added aprotinin and calcium chloride solutions, and into the fibrinogen solution is added 1 ml of Trypan Blue dye with a concentration of 0.6 mg/ml, after which the components are injected separately with the final polymerization in the lumen of the varicose vein.

Class no. 4

MD.37.

Title Method for restoring long tubular bone defects

Authors BÎRCĂ Radu, MD; STRATAN Vladimir, MD; CRUDU Mihail, MD; VEREGA Grigore, MD; CHELBAN Dumitru, MD; NACU Viorel, MD

Institution SMPhU *Nicolae Testemitanu*, Morphopathology, Chisinau, Republic of Moldova

Patent no. Patent No. 1391/2019

Description EN The invention relates to medicine, in particular to traumatology and orthopedics, reconstructive surgery and can be used for restoring long tubular bone defects. Summary of the invention consists in that it is carried out in two stages, namely in the first stage is made an incision at the level of the shank, on the anteromedial side, from the

greater tubercle of tibia to the distal 1/3 of the shank, then is removed the tibial periosteum, is formed an annular bone defect of a length of 3.0 cm in the medial 1/3 of the shank, the bone fragments are placed in the correct position and fixed with a metal plate with screws, and the defect cavity is filled with a cement spacer with an antibiotic, afterwards is performed the wound lavage with antiseptic solutions and the wound is sutured in layers. After 2 weeks, the second stage is carried out, which includes the incision of soft tissues at the same level, is removed the cement spacer, and the remaining cavity is filled with a tubular cortical demineralized bone graft and then the wound is sutured in layers, and locally is inoculated an allograft containing a culture of mesenchymal stem cells with a concentration of 4.5×10^6 /ml, then at the 6th week is made an incision at the same level, are removed the metal plate and the screws, and the wound is sutured in layers.

Class no.

4

MD.38.**Title**

Methods for cardiorenal syndrome risk prognosis; death risk prognosis; stroke and myocardial infarction prognosis in cardiorenal syndrome and intermediate or reduced ejection fraction heart failure patients

Authors

BIVOL Elena, MD; GRIB Livi, MD; JUCOVSCI Constantin, MD;

Institution

Nicolae Testemițanu State University of Medicine and Pharmacy, Republic of Moldova

Patent no.

Nr. 1341 /2018.12.11; Nr.1340 /2018.12.11; Nr.1339 /2018.12.06 / Patent application No. 113/28.05.2019; No. 114/28.05.2019; No. 115/28.05.2019;

**Description
EN**

The cardiorenal syndrome negative impact on prognosis has been proved by multiple studies. Most researchers described the increase in mortality, stroke and the rehospitalisation rate in cardiac patients with concomitant renal impairment.

Gonzalez (2016) has developed 4 models of mortality prediction in cardiorenal syndrome, but, his research was focused on acute heart failure. Unfortunately, up to date, there are no studies that would have evaluated the prognosis of the impact of type 2 cardiorenal syndrome in patients with chronic heart failure, moreover, there are no studies focused on the impact of the type 2 cardiorenal syndrome in

cardiovascular events development and available methods to predict them.

The essence of the invention consists in using the survey data (the cardiovascular disease length, history of stress or stroke); clinical data (heart failure severity) and paraclinical data (Cistatin C, serum hemoglobin, glomerular filtration rate estimation using Cistatine-C based formulas, brain natriuretic peptide level, triglycerides or thyroid hormone levels) echocardiographic (left ventricular dysfunction assessment) to predict the progression of the type 2 cardiorenal syndrome in intermediate or reduced ejection fraction ($\leq 49\%$). chronic heart failure patients.

The advantage of this method is to enhance the accuracy and objectivity of predicting the negative outcome of renal impairment in heart failure patients at any stage of healthcare.

The proposed methods allows early detection of patients at increased risk, which requires a tight follow up with timely correction of the therapeutic approach.

MD.39.

Title	Method for predicting the clinical course of deafness in children.
Authors	CHIABURU-CHIOSA Doina, MANIUC Mihail, CHIABURU Anghelina.
Institution	<i>Nicolae Testemițanu</i> State University of Medicine and Pharmacy of the Republic of Moldova.
Patent no.	MD 1388 (13) Y from 2019-06-12
Description	The invention relates to medicine, in particular to otorhinolaryngology and can be used for predicting the clinical course of sensorineural deafness in children.
EN	Summary of the invention lies in the fact that it is performed the bilateral otomicroscopy, impedancemetry with registration of the bilateral acoustic reflex, are recorded the otoacoustic emissions, acoustic distortion products and premature auditory evoked potentials, in the case when pathological disturbances of the auditory canal, tympanic membrane and landmarks are determined upon bilateral otomicroscopic examination, upon impedancemetric examination is determined a B, C1 or C2 type result with the presence of the bilateral acoustic reflex, in the presence of PASS-type bilateral otoacoustic emissions, acoustic

distortion products and premature auditory evoked potentials, a favorable course is predicted, and in the case when pathological disturbances of the auditory canal, tympanic membrane and landmarks are not determined upon bilateral otomicroscopic examination, upon impedancemetric examination is determined a type A result with the absence of the bilateral acoustic reflex, in the presence of Refer-type bilateral otoacoustic emissions and the absence of acoustic distortion products and premature auditory evoked potentials, it is predicted an unfavorable course of deafness in children.

Domains of application:

Medicine, Otorhinolaryngology and Audiology.

Class no.

4

MD.40.

Title

The cross-linking process of decellularized hepatic matrix.

Authors

COBZAC Vitalie, NACU Viorel, JIAN Mariana

Institution

Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova

Patent no.

MD 1393 Y from 2019-02-08

**Description
EN**

The invention relates to regenerative medicine and tissue engineering, and can be used for cross-linking of decellularized liver matrix to increase resistance of the transplant to the internal aggressive factors of the recipient. The essence of the invention is that the decellularized liver matrix is washed by perfusion with distilled water and/or saline buffer phosphate solution through the portal vein, to remove remnants of detergents. Then, after 1 hour starts a continuous perfusion of the matrix with aqueous or alcoholic riboflavin solution with a concentration of 0,2...0,25 mM, in a volume of 10 ml to 100 mg of matrix, at a speed of 1...5 ml/min, under the action of type A ultraviolet rays, with the wavelength of 365 nm, and the perfusion and reperfusion are prolonged until the discoloration of the riboflavin solution. Then, the cross-linked decellularized liver matrix is washed with distilled water and kept at 4°C.

The process of cross-linking of the decellularized liver matrix (4) with riboflavin (8) and UV-A rays (α) consists of

continuous perfusion of the decellularized matrix (4) with a riboflavin solution (8) through a tube (3) attached to a 0,22μ filter (7) with a peristaltic pump (6). After riboflavin solution depletion from the vessel (9) The tube end which is afferent to the peristaltic pump (μ) is inserted into the vessel with the decellularized matrix (2) for recycling of riboflavin solution (8), which lasts until the riboflavin solution is discolored.

Domains of application:

Regenerative Medicine, Tissue Engineering and Transplantology.

Class no.

4

MD.41.

Title

Method of prophylaxis of hypotension when using angiotensin 1 conversion enzyme inhibitors in the treatment of cardiovascular diseases

Authors

GHICAVÎ Victor, MD; COREȚCHI Ianoș, MD

Institution

Nicolae Testemitanu State Medical and Pharmaceutical University

Patent no.

MD 1374 Y, 2019

**Description
EN**

The invention relates to experimental medicine, clinical pharmacology and intensive care and can be used for the prophylaxis of hypotension when using angiotensin 1 conversion enzyme inhibitors in the treatment of cardiovascular diseases. The essence of the invention is that 2...4 mg/kg of an angiotensin 1 conversion enzyme inhibitor is administered intravenously and then 10...20 mg/kg of S-ethylisothiuronium bromide solution is administered intravenously. The advantages of the method consist in the fact that the administration of S-ethylisothiuronium bromide prevents excessive reduction of BP, or increases BP, with stabilization of its values. The invention allows to prevent and to correct excessive hypotension and possible hemodynamic disorders, which develop when using angiotensin 1 conversion enzyme inhibitors either alone or in interaction with other drugs. As a consequence, safety of angiotensin 1 converting enzyme inhibitors in the treatment of cardiovascular diseases is extended, the duration of hospitalization and the cost of treatment is reduced, the effectiveness of the treatment and the quality of life of the patients are enhanced.

Class no.

4

MD.42.**Title****Method of treatment of inflammatory diseases of soft tissues and joints****Authors**

GHICAVÎ Victor, COREȚCHI Ianoș, POPOVICI Olesea

Institution*Nicolae Testemitanu State Medical and Pharmaceutical University***Patent no.**

MD 1375 Y

**Description
EN**

The invention relates to experimental medicine and clinical pharmacology and can be used for the treatment of inflammatory disorders of soft tissues and joints in laboratory animals. The essence of the invention is that 10 mg/kg isopropylphosphite-S-isopropylisothiuronium solution and 10 mg / kg diclofenac solution are administered intraperitoneally in rats. The advantages of the method consist in the fact that in case of administration of isopropylphosphite-S-isopropylisothiuronium in combination with diclofenac, the synergistic, more pronounced anti-inflammatory action is obtained, due to the inhibition of both cyclooxygenase and nitric oxide synthesis. The invention allows to potentiate the anti-inflammatory action of diclofenac by the combined use with isopropylphosphite-S-isopropylisothiuronium. The combined use of these two medicinal substances determines the development of a more pronounced anti-inflammatory action, concomitantly it is possible to use diclofenac in lower doses than usual. Thus, the effectiveness of the treatment of inflammatory diseases of the soft tissues and joints is increased. At the same time, the incidence of gastrointestinal adverse reactions of diclofenac decreases.

Class no.

4

MD.43.**Title****Method for assessing the athero-protective activity of biologically active substances****Authors**

Șveț Inna, Pantea Valeriana, Tagadiuc Olga, Gudumac Valentin, Popa Veaceslav, Andronache Lilia

Institution

USMF „Nicolae Testemițanu”, REPUBLICA MOLDOVA

Patent no.

nr. MD 1365/2019

Description

The invention relates to medicine and biochemistry and can

EN

be used for assessing the athero-protective activity of biologically active substances. Summary of the invention: the test substances in various concentrations are mixed with a solution comprising PON1/arylesterase enzyme in phosphate buffer, pH 7.4, then incubated at 37°C for 5...10 min, after which is added a reaction medium comprising p-nitrophenyl acetate, CaCl₂ and chloramine T to obtain the test sample, the control sample is prepared identically as the test sample, but the test substance is replaced with an equivalent amount of buffer phosphate, pH 7.4, and the blank sample is prepared identically as the control sample, but the reaction medium does not contain the PON1/arylesterase enzyme, then is determined the initial absorption of A1 at 405-410 nm, after which the samples are incubated at 37°C, for 30 min and is redetermined the absorption of A2 at 405-410 nm, then is calculated the percentage of activation of PON1/arylesterase of the test substances, at the same time, the higher the percentage of activation of the corresponding concentration of the test substances the higher the athero-protective activity.

Benefits: The advantage of the method is the reduction of the time spent in carrying out the analysis, the increase of the labor productivity and the economic efficiency, the increase of the sensitivity, the precision and the reproducibility of the method, it excludes the use of living organisms, and allows to detect more precisely the athero-protective effects of the test substances.

Applications: medicine, biochemistry, pharmacology, drug production technology, laboratory diagnostics.

Class no.

4

MD.44.**Title**

**NITRATO- [2 - ({2 - [(ETHYLSULPHANYL) (PROP-2-EN-1-IL) IMIDOYL)
HYDRAZINYLIDENEMETHYL) PHENOLATO]
AQUA COPPER IN QUALITY OF THE
INHIBITOR OF SUPEROXIDE RADICALS**

Authors

Gudumac Valentin, Gulea Aurelian, Țapcov Victor, Pantea Valeriana, Usataia Irina, Graur Vasilii, Sardari Veronica

Institution

USMF „Nicolae Testemițanu” RM

Patent no.

Patents No.: **MD 4668/2019**

The invention relates to chemistry and medicine, namely to a coordinating compound of biologically active copper of the class of isothiomicarbazide of transition metals. This complex inhibits the exacerbation of the processes of affecting organic molecules with superoxide radicals in the body. Due to these properties he can find application in medicine as an inhibitor of superoxide radicals in the body, thus preventing the development of cellular and tissue lesions, atherosclerosis and carcinogenesis.

Description
EN

Summary of the invention consists in the synthesis of a synthetic inhibitor of the superoxide radicals based on nitrate- [2 - ({2 - [(ethylsulfanyl) (prop-2-en- 1 -il) carbonimidoyl] hydrazinylidene} methyl) aqua copper.

The claimed compound extends the arsenal of inhibitors of synthetic superoxide radicals with high biological activity.

Benefits: The claimed compound captures and neutralizes RLO, in particular the superoxide radical, thus preventing the development of cellular and tissue lesions, including inflammatory processes, atherosclerosis and carcinogenesis in the human body.

Applications: medicine, pharmacology, pharmacy, medicine technology, bio-organic chemistry

Class no.

4

MD.45.

Title

Ulcerative colitis and liver pathology: clinical and paraclinical interrelations.

Authors

Jucov Alina, Țurcan Svetlana, Tcaciuc Eugen

Institution

State University of Medicine and Pharmacy „Nicolae Testemițanu” of RM

Patent no.

Description
EN

For the first time in the Republic of Moldova a comprehensive study was performed which focused on assessing the frequency of viral and non-viral liver diseases in patients with UC in the Republic of Moldova, which is a region with a high prevalence of liver diseases, in particular, diseases of viral genesis. The study analyzed the impact of viral hepatitis virus infections on clinical and paraclinical evolution of ulcerative colitis. The scientific

problem solved in that research consists in the determination of the frequency and spectrum of liver diseases in patients with UC in the Republic of Moldova. Patients with UC are at risk for HBV and HCV infection, which has been demonstrated by the much higher level of HBV and HCV in patients compared to blood donors.

Class no.

4

MD.46.

Title

Vicissitudes from anamnestic to diagnosis

Authors

Mazur-Nicorici Lucia, Diaconu Camelia

Institution

State University of Medicine and Pharmacy „Nicolae Testemițanu” of RM

Patent no.

Nr : 0 6528

**Description
EN**

This volume is the result of a team effort made up of doctors from different specialties from university clinics in the Republic of Moldova, but also from Romania. This book brings to the reader a collection of clinical cases, which have raised problems of differential diagnosis and treatment and have gradually settled. The presented case is very diverse, from patients with systemic lupus erythematosus, dermatomyositis, rheumatoid arthritis, vasculitis, intoxication at work, to patients with ochronosis, cardio-renal syndrome, myocarditis, hypertrophic cardiomyopathy, biliary biliary cancer, primitive biliary cancer pulmonary, non-Hodgkin's lymphoma, luetic aortitis, sarcoidosis, urothelial, bladder tumors, Wilson's disease, etc. Most of the times, the positive diagnosis was a challenge, requiring investigations and interdisciplinary quality collaborations.

However, each of these patients represented a lesson for the doctors who cared for them and considered that it was useful to send it further. The starting point of the book was the desire to create a bridge between different medical schools, clinical experiences, which is more indicated today than ever.

Class no.

4

MD.47.

Title

Method for treating external intestinal fistulas

Authors

PISARENCO Sergiu; CUȘNIR Adrian ANGHELICI Gheorghe; ZUGRAV Tatiana.

Institution	NICOLAE TESTEMITEANU State Medical and Pharmaceutical University, Republic of Moldova
Patent no.	MD- 1407 The invention relates to medicine, in particular to purulent surgery and can be used for conservative treatment of external intestinal fistulas. Summary of the method consists in that 20...40 ml of blood is sampled from the pa-tient 24...48 hours before treatment, where is added 20...100 IU of heparin per 1 ml of blood, is separated a suspension of mono-nuclear cells comprising 3×10^7 /ml of cells, also from the patient 2...3 hours before the first procedure is sampled 40...60 ml of blood, which is centrifuged for 8...12 min with 3000...3500 rpm to obtain a fibrin clot enriched with thrombocytes, the wound around the fistula is treated with antiseptic solutions, are aspirated the intestinal contents from the fistula, then subcutaneously around the fistulous opening, at a distance of 1 cm from its edges is administered the prepared suspension of mononuclear cells in the amount of 2...3 ml, after which into the fistula channel is introduced the said fibrin clot, the procedure is repeated every 5 days, and the course of treatment includes 4...5 proce-dures.
Description EN	
Class no.	4

MD.48.

Title	Method for diagnosing dento-maxillary anomalies in children with central sensory disorders
Authors	POȘTARU Cristina, MD; RAILEAN Silvia, MD; RAILEAN Gheorghe, MD; UNCUȚA Diana, MD
Institution	UNIVERSITATEA DE STAT DE MEDICINĂ ȘI FARMACIE "NICOLAE TESTEMIȚANU" RM
Patent no.	PATENTnr.: 1402 The invention relates to medicine, in particular to neurology and dentistry, and can be used for diagnosing dentomaxillary anomalies in children with central sensory disorders. Summary of the invention consists in that it is conducted the clinical and paraclinical examination and, if the presence of facial asymmetry, abnormal relationship at the level of the incisor teeth in the sagittal, vertical or transversal plane and the presence of pain syndrome during chewing is determined, at the same time, upon assessment of muscle activity with the help of electromyographic
Description EN	

examination are determined disorders of the masticatory muscle electrical activity, namely: amplitude of the potential less than 500 μV , frequency greater than 12 cycles/s and duration of the potential greater than 16 ms on the affected side, it is determined a dentomaxillary anomaly of a peripheral character, and if the clinical picture is identical to the above, and during the electromyographic examination is determined that the amplitude of the potential is of 500...700 μV , the frequency is of 4...12 cycles/s and the duration of the potential is of 4...16 ms on the affect-ed side, it is determined a dentomaxillary anomaly of a central character.

Class no.

4

MD.49.

Title

Method of treatment of community pneumonia with respiratory recurrence in children

Authors

Ala Donos, MD, profesor, D.H.M., Iliev Albina-Mihaela, Dr., Constantin Spînu, MD, profesor, D.H.M., Ig. Spînu, MD, PhD, Aliona Serbulenco, MD, Dr. m., Luminița Suveică, MD, PhD., Tatiana Alsaliem, MD, Dr.

Institution

State University of Medicine and Pharmacy "Nicolae Testemitanu" of the Republic of Moldova

Patent no.

-

**Description
EN**

The invention relates to medicine, in particular to the development of an original method of prophylaxis and treatment of recurrent community acquired pneumonia in children. The invention consists in enhancing the immunocorrection effect of immune system in children with community acquired pneumonia, following the use of two medicinal products with synergistic effect: T-artivin and sodium nucleinate. The algorithm of using these two medicinal products involves improving in clinical-immunological indices and significant reduction of treatment length in children with recurrent community acquired pneumonia. The use of this immunocorrection algorithm especially before the cold season in addition to the therapeutic outcome also demonstrates prophylactic effect of acute viral respiratory infections.

Class no.

4

Moldova State University

MD.50.

Title	Method of estimating the ecochemical state of surface waters
Authors	Gheorghe DUCA, Viorica GLADCHI, Elena BUNDUCHI
Institution	Moldova State University
Patent no.	Patent application a 2019 0063/2019.07.19
Description	The invention relates to ecological chemistry and can be used in estimating the ecochemical state of surface waters. It is proposed the spectrophotometric determination of the stationary concentration of hydrogen peroxide in water or of the peroxidase reducing substances, which is preferentially oxidized with hydrogen peroxide and, therefore, the recording of the oxidizing or reducing state, using the kinetic parameter redox state. Compared with the existing methods, when applying the proposed method, the ratio between the active redox equivalents, which plays a major role in natural water self-purification processes, is determined quickly and efficiently, does not require sophisticated equipment and characterizes the presence or absence of water toxicity factors.
EN	
Class no.	1

MD.51.

Title	New inhibitor of proliferation of human promyelocytic leukemia cells HL-60 with increased solubility in water
Authors	Aurelian GULEA, Valentin GUDUMAC, Ion TODERAȘ, Olga GARBUZ, Vasiliu GRAUR, Elena ROȘCOV, Victor ȚAPCOV.
Institution	Moldova State University; Institute of Zoology
Patent no.	MD 4581/2019.02.28; MD 1279/2019.03.31
Description	The invention relates to chemistry and medicine, in particular to a biologically active organic compound of the thiosemicarbazide class and can be used for preventing and treating human myeloid leukemia. The described compound has an increased solubility in water. It inhibits the growth and multiplication of 97.0% of HL-60 cells of human myeloid leukemia at 10^{-5} M concentration, 95.1% at 10^{-6} M concentration and 84.0% at 10^{-7} M concentration. This compound exceeds 2 times the prototype's analogous characteristics. The discovered properties of the substance are of interest for medical practice for enhancement of the arsenal of human myeloid leukemia inhibitors.
EN	
Class no.	4

MD.52.**Title**

Cyanobacterium *Anabaena spiroides* var. *minima* (Nygaard.) Kossinsk. – a source of bioactive substances

Authors

Alina TROFIM, Valentina BULIMAGA, Liliana ZOSIM

Institution

Moldova State University

Patent no.

MD 4627/2019.11.30

**Description
EN**

The cyanobacterium *Anabaena spiroides* var. *minima* is a natural, ecological material, useful in various fields, being a source of proteins, polysaccharides, pigments, and other bioactive substances that can be employed in the production of bio cosmetics with anti-wrinkle and moisturizing effects, in the pharmaceutical field (in the production of antibiotics), in medicine – for the treatment of various illnesses, in agriculture – for the stimulation of seed germination and enhancement of plant productivity.

Class no.

4

MD.53.**Title**

Ethyl-4-{2-[(pyridin-2-ylmethylidene)-hydrazinocarbothioyl]amino benzoate monohydrate exhibiting properties of human myeloid leukemia HL-60 cell proliferation inhibitor

Authors

Aurelian GULEA, Roman RUSNAC, Anna RUSNAC, Victor ȚAPCOV

Institution

Moldova State University

Patent no.

MD 4613/2019.01.31

**Description
EN**

The invention relates to chemistry and medicine, namely to a novel biologically active organic compound of the thiosemicarbazone class and may find application in medicine for the prophylaxis and treatment of human myeloid leukemia. The compound ethyl-4-{2-[(pyridin-2-ylmethylidene)hydrazinocarbothioyl]amino}benzoate is a molecular inhibitor of the multiplication of HL-60 cells of human myeloid leukemia, is active at concentrations 10^{-5} - 10^{-7} mol/L and has a half-maximal inhibition concentration (IC_{50}) equal to 0.1 μ mol/L, which is 10 times more effective than doxorubicin drug used in medicine in chemotherapeutic treatment.

Class no.

Applications: Medicine and pharmaceuticals.

4

MD.54.**Title** Process for generating nitrogen compounds**Authors** Vasile GUTSANU**Institution** Moldova State University**Patent no.** MD 4460/2017.08.31**Description**
EN

The invention relates to chemistry, in particular to a process for generating under normal conditions nitrogen compounds. Invention consists in that a process is proposed which provides for the barbotage of air through a reactor comprising a cross-linked polymer with strongly basic functional groups and $\text{Ga}_2(\text{SO}_4)_3$ or $\text{In}_2(\text{SO}_4)_3$ solution at a temperature of 0 – 25°C and atmospheric pressure.

Class no.

9

MD.55.**Title** Knowledge Bases for the Recognition of Psychiatric Disorders in Epilepsy**Authors** Mariana BUTNARU, Alexandru BELDIGA, Alexandru POPOV, Gheorghe CĂPĂȚĂNĂ, Ana CĂPĂȚĂNĂ**Institution** Moldova State University**Patent no.** Seria OȘ 5771/12.12.2017**Description**
EN

Natural language demonstrates ambiguity when describing facts, including medical ones. Therefore, the authors have formalized the knowledge of *psychiatric disorders in epilepsy* (PDE).

Knowledge bases (KB) for the recognition of PDE integrates 5012 elements organized into three levels: 27 *diagnoses*, 17 *syndromes*, 162 *symptoms*.

Acknowledgements. The **innovations** was possible due to the institutional project „*The development of intelligent information systems focused on families of decision-making problems with application in education and research*”, cipher 15.817.02.38A.

Class no.

4, 10

MD.56.**Title** InP PHOTODETECTORS AND PHOTOVOLTAIC CELLS WITH ANTIREFLECTIVE COATING**Authors** Vasile BOTNARIUC, Leonid GORCEAC,

Andrei COVAL, Boris CINIC, Simion RAEVSCHI, Sergiu VATAVU

Institution Moldova State University

Patent no.	MD 4510/2017.08.31; MD 4554 B1/2018.02.28; MD 4686/2020.03.31
Description EN	<p>The aim of invention consists in photodetectors and photovoltaic cells (PVC) fabrication based on pInP junctions. The technological procedure of photodetectors and photovoltaic cells fabrication from indium phosphide (InP) includes obtaining of p^o-p⁺InP isostructure of In-n⁺CdS-p⁺InP-(Ag+5%Zn) heterojunction and of In-n⁺CdS-n⁺-p⁺InP-(Ag+5%Zn) homojunction by using gaseous phase epitaxy in the In-PCl₃-H₂ system, quasi-closed volume technology and vacuum thermal evaporation. The SiO₂/ZnO antireflective layer was deposited by electron beam evaporation (300 K)/pyrolysis spray.</p> <p>Testing of hetero- and homojunctions prepared as photodetectors and photovoltaic cells under standard conditions (AM1) showed that their external quantum efficiency is of 75 ... 80%, and the maximum conversion efficiency of the solar radiation (AM1) – 12%.</p> <p>Advantages: Photodetectors/PVC fabricated from InP have high resistance to the influence of corpuscular radiation: electron/proton flux with energy of 1/20 MeV and flux density of 2.10¹⁵/2.10¹² cm⁻². The parameters degradation in time of these devices is insignificant (3-4% in 10 years).</p>
Class no.	2

MD.57.

Title	New native varieties of aromatic and medicinal plants for the Republic of Moldova
Authors	Victor MELNIC, Elena PELEAH
Institution	Moldova State University
Patent no.	<p>Patent for plant variety no. 267, Mint variety <i>NISTRU</i> R1/2018.02.28; Patent for plant variety no. 340, Mint variety <i>SPERANȚA</i>-2017/2020.03.31 Patent for plant variety no. 337, <i>VICTORIA</i> variety mint/2020.03.31; Patent application for plant variety v 2019 0009/2019.03.26, Mint variety <i>SILVER</i>.</p>
Description EN	These mint varieties are proposed to the producers of aromatic and medicinal plants as new crops resistant to

drought, diseases and pests, with high yield of biomass and oil/ha, as a plant product and bioactive substances that can be used in the pharmaceutical, cosmetological and food industry.

The invention relates to the branch of agriculture in solving the local problem of the current drought, the introduction of new crops with high income in the value chain, raw material with high active principles for the pharmaceutical, cosmetological, curative industry of the food industry.

Advantages: Drought resistant varieties, diseases and pests, biomass increased to 1ha, high content of etheric oil - up to 3.05%. Qualitatively rich in menthol, mentaforan, linaluol. Long-term storage of the conditioned plant product. Valuable in the pharmaceutical industry as antimicrobial, antiviral, cardiogenic.

Class no.

3, 4

MD.58.

Title

Detecting of plants infected by parasites from a remote distance

Authors

Arcadi CHIRIȚA, Nadejda NASEDCHINA, Tatiana BULIMAGA, Vladimir PRILEPOV

Institution

Moldova State University

Patent no.

Patent application a 2018 0111/2018.12.19

Description

EN

The aim of the invention is the detection of plants infected by parasites from a remote distance basing on the spectral reflectance. The optical scheme is based on a telescopic system, a set of narrow-band interference filters and a digital camera. The light signal reflected from the plant is passed through a set of narrow-band interference filters and recorded by a digital camera. Computer image processing allows obtaining the intensity of the reflected signal depending on the wavelength. The result is a spectral dependence of the reflection for a healthy and infected part of the plant. The resolution of the optical system and the digital camera allows obtaining the spectral dependence of the reflectance for the infected areas of the plant from 1 mm in size from a distance of at least 15 m. Plant parasites can be recognized by the characteristic reflectance spectra. The infection of plant with parasites can be detected at the earliest stage, when the size of the infected area is about 1mm. Using modern compact Unmanned Aerial Vehicle (UAV) for the visual monitoring requires using compact telescopic system and CCD camera.

Placement of a set of compact narrowband interference filters between the optical system and the CCD camera allows not only visual monitoring but also registering reflectance spectra of the vegetables. The UAV can also be equipped with a device for spraying anti-parasitic reagents, which allow treating locally infected areas at an early stage of infection of plants.

Class no.

3

MD.59.**Title**

The method of grafting quercetin in copolymers of chitosan with maleic anhydride

Authors

Stefan ROBU, Maria GONTA, Larisa MOCANU, Elena SIRBU, Cristina CEACIRU

Institution

Moldova State University

Patent no.

Patent application a 2019 0037/2019.04.22

The invention relates to the field of biochemistry and medicine, in particular to a process for obtaining a polymeric material with antioxidant properties, from chitosan copolymers with polyphenols, in particular with quercetin, which can be used in the field of medicine, pharmaceuticals and others.

The problem solved by the present invention is the elaboration of a quercetin grafting process on chitosan copolymers with maleic anhydride which would provide a grafting process that is much easier to control and lacking enzymes.

The essence of the invention is that the process of grafting quercetin to chitosan copolymers with maleic anhydride which includes grafting quercetin to the chitosan copolymer with maleic anhydride (1:1) by treating at 0-5 °C the copolymer solution in dimethylformamide with ethyl chlorformate and triethylamine, then with quercetin solution in dimethylformamide, and the concentration of quercetin in the copolymer varies from 10 to 50 mol%. The completion of the chemical reaction was verified by means of thin layer chromatography. The polymer-analog structure obtained was confirmed by IR spectroscopy. To detect the prolongation effect, ie the release time of quercetin from the polymeric material. In order to determine the antioxidant activity of the obtained product, ABTS⁺⁺ and DPPH tests were applied. According to the ABTS⁺⁺ test, the total antioxidant activities (AAT) of the synthesized copolymer with different concentrations of quercetin (10; 30; 50 mol%) were determined. The DPPH assay indicates that Quv functionalized chitosan has stronger antioxidant activity than the same concentration of pure quercetin.

**Description
EN**

Class no.

4. Medicine-Health Care- Cosmetics

MD.60.

Title **Chitosan functionalization process with ascorbic acid**
Authors Maria GONTA, Iacob GUTU, Mihail CEACIRU, Cristina CEACIRU

Institution **Moldova State University**

Patent no. Patent application a 2019 0036/2019.04.22

The invention relates to the field of biochemistry and medicine. Chitosan functionalized with natural antioxidants has reducing properties. These compounds can be applied in the inhibition process to the formation of carcinogens (N-nitrosamines) as a result of nitrosation of the drug substances with nitrite-ions.

The essence of the invention is that a method of functionalizing chitosan with ascorbic acid is proposed, which includes the interaction of chitosan with ascorbic acid in a 0.5% acetic acid solution, under aerobic conditions, for 3 hours at 100 °C.

The advantage of the invention, compared to the existing methods, consists in reducing the synthesis time by 2 times, performing the process in the aerobic environment and not in an inert gas environment.

Description
EN

The mechanism of the reaction between chitosan and ascorbic acid represents the functionalization of chitosan with ascorbic acid through the interaction of amine (-NH₂) groups of chitosan and hydroxyl (-OH) groups of ascorbic acid, with the elimination of a water molecule, forming the covalent bond.

The reaction yield is 68%, the molar ratio of the reactants 1:1. The content of ascorbic acid in the obtained copolymer is 11.2%.

To demonstrate the structure of the synthesized copolymer, the chemical structure was analyzed by FT-IR, ¹H-NMR spectra.

The physico-chemical study indicates an increase of the solubility of the synthesized product in acidic solutions and in water. In order to determine the antioxidant activity of the obtained product, ABTS⁺⁺ and DPPH tests were applied. The ABTS⁺⁺ test indicates an increase in the antioxidant activity of the synthesized compound by 16.7% higher than the activity of pure ascorbic acid.

Class no.

4. Medicine-Health Care- Cosmetics

MD.61.

Title	UVS in Environmental Monitoring and Pollution Control
Authors	Veaceslav SPRINCEAN, Adrian PALADI, Florentin PALADI
Institution	Moldova State University
Patent no.	NARD&MSU supported research project #20.80009.7007.05
Description	Civil applications of UVS (Unmanned Vehicle Systems/ drones) are growing constantly. We present the air content analysis system "SOWA" (measuring station) upgraded as a mobile air pollution control laboratory, which allows reading air content directly from the source. Altitude range is from 0 to 120 m, which is legally allowed altitude for civil drones. Device can also take air samples from 70 cm distance of measuring probes, which eliminates air flow from engines. The station is additionally equipped with camera to record and analyze in real-time regime consolidated material with video and time-space parameters. These data are further used in computer modeling and forecast of the impact of biotic and abiotic factors, as well as in the systemic analysis and interpretation of monitoring results.
EN	Station can be operated in the temperature range from -20° to 50°C, up to 10 m/s wind, UVS time in the air being up to 32 min with a dedicated drone. Dust concentration detection range 0-1999.9 $\mu\text{g}/\text{m}^3$, sensitivity 0.3 $\mu\text{g}/\text{m}^3$ laser method; organic compounds detection range 0-32 ppm; formaldehyde detection range 0-5 ppm, resolution 0.01 ppm; hydrogen chloride detection range 0-100 ppm; hydrogen cyanide detection range 0-100 ppm. We present outdoor data obtained in the MSU campus, where air quality requirements are met: $\text{PM}_{10}=36 \mu\text{g}/\text{m}^3$ and $\text{PM}_{2.5}=16.6 \mu\text{g}/\text{m}^3$, where $\text{PM}_{2.5}$ refers to the atmospheric particles (PM) having a diameter of less than 2.5 μm , that is approximately 3% of the diameter of a human hair, whereas PM_{10} denotes 10 μm or less particles called fine particles.

MD.62.

Title	THE INFLUENCE OF THE RAUT RIVER ON THE CAPACITY OF CHEMICAL SELF-PURIFICATION OF THE NISTRU RIVER IN THE PERIOD OF 2015-2019
Authors	Vladislav BLONSCHI, Viorica GLADCHI, Elena BUNDUCHI
Institution	Moldova State University
Patent no.	15.817.02.35A
Description	For the complex estimation of the intensity of the chemical self-

EN

purification processes, we study not only the specific kinetic parameters – inhibition capacity, redox state, stationary concentration of the OH radicals, but also the tendency to change the concentration of certain classes of compounds, which directly participate in redox reactions, either as an oxidizing substrate or as a reducing substrate, such as thiol substances (R-SH). During 2015-2019 years thiols content in waters of the Dniester and Raut Rivers was monitored, selecting 3 catchments, in order to follow the tendency of composition changes in Dniester waters. The concentrations of thiols detected in both rivers fall within the limits of orders 10^{-5} - 10^{-6} M. There was a slight increase in thiols concentration during the Dniester, with the exception of 2015 and 2019. Therefore, according to the thiols concentrations, the Raut River does not significantly influence the chemical self-purification capacity of Dniester River. Although according to the multiannual media, there is a slight increase in thiols content in Dniester after Raut discharge, these concentrations don't disturb the natural seasonal variation of these reducers, excepting spring, a phenomenon that can be explained by the low speeds of biological processes.

Monitoring of thiols concentration in surface water bodies allows indirect evaluation of chemical self-purification processes intensity. The provenance of thiols can be determined by interpreting seasonal results, at the same time it allows to identify pollution sources, their nature and the influence of some tributaries on the economically valuable water bodies.

Applications: Environment – Pollution Control.

MD.63.**Title****REDOX SELF-PURIFICATION PROCESSES OF NATURAL WATERS****Authors**

Elena BUNDUCHI, Viorica GLADCHI, Vladislav BLONCHI

InstitutionMoldova State University
15.817.02.35A**Description**
EN

The oxygen biogeochemical cycle (OBC) in natural waters is of great importance in water self-purification processes. The water self-purification capacity can be assessed measuring the concentration of different OBC components. Thus, in this work the concentrations of some OBC components, H_2O_2 and the reducing compounds oxidized by H_2O_2 (Red) were determined.

The monitored objects were Nistru River, in the Dubasari-Vadul lui Voda dam segment, its tributaries, Raut and Ichel, at the mouths of confluence with the river, and the Ghidighici and Danceni lakes.

Water monitoring for the period 2015-2019 revealed the following. The average annual values for the Nistru River show the minimum H_2O_2 value of 1.7 $\mu\text{g/L}$ and the maximum of 14.5 $\mu\text{g/L}$; 0 and 20 $\mu\text{g/L}$ for the Bâc River and 0 and 9.2 $\mu\text{g/L}$ for those of the Ichel River; 2.4-13.2 and 2.5-8.5 $\mu\text{g/L}$ for the Ghidighici and Danceni lake respectively.

The peroxide concentrations were frequently closer to the lower limit of this oxidant in natural waters (10-100 $\mu\text{g/L}$), showing a constant and high H_2O_2 consumption in self-purification of these natural waters.

Applications: Environment – Pollution Control.

Class no.

**Institute of Emergency Medicine (IMSP)
The State University of Medicine&Pharmacology
“Nicolae Testemițanu” Moldova, Chișinău**

MD.64.

Title	THE IMPACT OF STROKE PREVENTION MEASURES ON THE RISK OF ITS OCCURRENCE.
Authors	GROPPA Stanislav, EFREMOVA Daniela, ZOTA Eremei
Institution	The Institute of Emergency Medicine , The State University of Medicine& Pharmacology “Nicolae Testemițanu”
Patent no.	Certificat SAIP AGEPI MD seria OȘ 6238 din 18.01.2019
Description EN	Stroke (stroke) is the first cause of adult disability, the second cause of dementia and the third cause of mortality in developed countries. The physical, psychological and financial impact on patients, their families, health systems and society is a major one. Prevention of stroke is a complex medical and social problem, there is clear evidence that prevention of stroke is feasible in practice and the need to extend primary prevention of stroke is urgent. It was developed a phased protocol of assessment of risk factors for stroke and assessment of individual stroke risk. The results of the implementation of this phased protocol revealed the expression of each risk factor for stroke, the relationships between these factors and their impact on the recurrence of stroke.
Class no.	4. Medicine - Health Care – Cosmetics

MD.65.

Title	NONOPERATIVE MANAGEMENT OF LESIONS OF PARENCHYMATOUS ORGANS IN POLY-TRAUMATIZED PATIENTS.
Authors	GHIDIRIM Gheorghe, ROJNOVEANU Gheorghe, GURGHIS Radu, CIOCANU Mihail, BOLEAC Diana
Institution	The Institute of Emergency Medicine , The State University of Medicine& Pharmacology “Nicolae Testemițanu”
Patent no.	Certificat SAIP AGEPI MD seria OȘ 6349 din 10.06.2019
Description EN	Nonoperative management-new concept of solving closed traumas of parenchymal organs. The recorded results confirm that transfusion of two units of erythrocyte mass in the first hours of hospitalization limits the TNO of LH or LL closed isolated. TNO may be continued in polytraumatized patients

requiring higher transfusion volumes only if it is established that they are necessary for associated lesions, which is confirmed by significantly higher volumes in haemothoracic trauma and / or bone fractures. The results of that scientifically has been shown that the management of the nonoperation's injury lienal and the liver closed, it can be applied in abdominal trauma, isolated and associated, in patients with hemodynamic stable or stabilized by the repletion volume, without the additional risks and politraumatized with ISS > 25, and in the absence of other indication of surgery.

Class no. 4. Medicine - Health Care – Cosmetics

MD.66.

Title

NONOPERATIVE MANAGEMENT OF LESIONS OF PARENCHYMATOUS ORGANS IN POLYTRAUMATIZED PATIENTS WITH IMPAIRED CONSCIOUSNESS (NEUROLOGICAL INTEGRITY).

Authors

GHIDIRIM Gheorghe, ROJNOVEANU Gheorghe, GURGHIS Radu, CIOCANU Mihail, PLAMADEALA Svetlana, CLIM Alexandru

Institution

The Institute of Emergency Medicine , The State University of Medicine& Pharmacology “Nicolae Testemițanu”

Patent no.

Certificat SAIP AGEPI MD seria OȘ 6347 din 10.06.2019

Description EN

For the first time in the Republic Of Moldova was implemented nonoperative tactics of treatment of closed lesions of parenchymal organs, demonstrating the possibility and efficiency of applying TNO and polytraumatize. By applying TNO to traumatizes with compromised neurological integrity it has been shown that the disorder of consciousness is not an absolute criterion for avoiding TNO. Laparoscopy as a way of arguing the successful application of TNO to unconscious polytraumatizations with rather reserved prognosis increased the rate of nonoperative resolution of liver and spleen lesions by 18.1%. Mandatory selection criteria for nonoperative management of closed traumatic lesions of spleen and liver were systematized, the advantages of TNO and the determinants of failure were highlighted. The rational diagnostic-curative algorithm of solving closed liver and spleen lesions was developed through the contemporary opportunity of nonoperative management.

Class no.

4

MD.67.

Title	PREDICTIVE MODELS FOR THE LETHALITY OF PATIENTS WITH SEVERE TRAUMA TRANSPORTED ON THE AVIASAN LINE FROM DISTRICT HOSPITALS TO THE INSTITUTE OF EMERGENCY MEDICINE
Authors	ARNAUT Oleg, SANDRU Serghei, ROJNOVEANU Gheorghe, CIOCANU Mihail, SAULEA Aurel, CLIM Alexandru, COBILETCHII Serghei, VOVC Victor, LOZOVANU Svetlana, BALTAGA Ruslan, GRABOVSCII Ion
Institution	The Institute of Emergency Medicine , The State University of Medicine& Pharmacology “Nicolae Testemițanu”
Patent no.	Certificat SAIP AGEPI MD seria OȘ 6351 din 10.06.2019
Description EN	3 predictive models were developed for the survival rate of patients with severe traumatism transferred from district hospitals to the Institute of Emergency Medicine (IMU). The model that includes NISS, an anatomical score was significant, the effect of anatomical lesions for this category of patients being estimated quantitatively. Based on the results obtained, we obtained a coefficient of determination .6 (60%) compared to .4 (40%) for patients admitted directly to the IMU. Thus, we speculate that the transfer of patients increases the importance of anatomical lesions for the results of treatment. Using the regression technique were found to the predictive models for in-hospital lethality in patients with severe trauma, transferred through the SERVICE line from the district to go to IT. Within the proposed models the predictive power of NISS, MPs and their combination have been demonstrated. Thus, the created models with relative good fit can be recommended for use in the National moldavian medical system
Class no.	4

MD.68.

Title	NEW BIOMARKER FOR DETERMINING SURVIVAL RATE IN POLYTRAUMA
Authors	ARNAUT Oleg, SANDRU Serghei, ROJNOVEANU Gheorghe, CIOCANU Mihail, SAULEA Aurel, CLIM Alexandru, COBILETCHII Serghei, VOVC Victor, LOZOVANU Svetlana, BALTAGA Ruslan, GRABOVSCII Ion
Institution	The Institute of Emergency Medicine , The State University

Patent no.	of Medicine& Pharmacology “Nicolae Testemițanu” Certificat SAIP AGEPI MD seria OȘ 6350 din 10.06.2019 Predictive models, give the ability to predict the probability of death / survive in the population of patients with trauma / polytraumatism. Protease D is intracellular protease, involved in apoptosis, processing of a large number of various enzymes, antigens, hormones and neuropeptides. Using the regression technique could not be removed from the cache to the predictive model for in-hospital lethality in patients with polytrauma, the enzymatic activity of cathepsin D at 3 and 48 hours, being biomarkers for the evolution for these patients. Thus, the created model with relative good fit can be recommended for use in the National Moldavian medical system. Thus, the developed model, having adequate characteristics, can be recommended for use in the domestic medical system. The OECD collected 3 and 48 hours after the trauma are biomarkers for evolution.
Description EN	
Class no.	4

MD.69.

Title	PREDICTIVE MODELS FOR HOSPITAL LETHALITY IN PATIENTS WITH TRAUMA/POLYTRAUMA. THE EFFECT OF PROPHYLACTIC MECHANICAL VENTILATION.
Authors	ARNAUT Oleg, SANDRU Serghei, ROJNOVEANU Gheorghe, CIOCANU Mihail, SAULEA Aurel, CLIM Alexandru, COBILETCHII Serghei, VOVC Victor, LOZOVANU Svetlana, BALTAGA Ruslan, GRABOVSCII Ion
Institution	The Institute of Emergency Medicine , The State University of Medicine& Pharmacology “Nicolae Testemițanu”
Patent no.	Certificat SAIP AGEPI MD seria OȘ 6352 din 10.06.2019 Complex treatment of severe / critical trauma includes several components, respiratory management. The effects of VAPP were estimated in the context of predictive models for intra-hospital lethality in trauma, the result being adjusted to age, severity of injuries and gender. Using the regression technique were found to the predictive models for in-hospital lethality in patients with severe and critical trauma. Within the proposed models, the beneficial effect of VAPP ventilation for lethality in trauma was demonstrated, results were adjusted for the age and severity of injuries. Thus, the prophylactic mechanical ventilation is recommended as a component of the complex treatment of patients with traumas admitted into the Intensive care
Description EN	

Unit/Reanimation.
Class no.

4

MD.70.

Title **ABDOMINAL TRAUMA AND ASSOCIATED TRAUMATIC HEMOPERITONEUM. HEMOPERITONEUM IN THE EXPERIMENTAL MODEL. THE STUDY OF THE CONSEQUENCES.**

Authors ANESTE Eduard, ROJNOVEANU Gheorghe, GURGHIS Radu, TAGADIUC Olga, CIOCANU Mihail, GAGAUZ Ion

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

Patent no. Certificat SAIP AGEPI MD seria OȘ 6469 din 08.10.2019

Description Uncontrolled posttraumatic bleeding is the leading cause of preventable death among traumatised patients. Based on the experimental results obtained traumatic hemoperitoneum in the absence of lesions of peritoneal sheets does not induce adhesion formation, so the nonoperative approach of closed lesions of parenchymal organs does not carry this theoretically assumed risk. A detailed analysis of the course of traumatic hemoperitoneum was performed in patients with closed abdominal trauma treated non-operatively by studying the clinical, hemodynamic, imaging, biochemical and remote intoxication aspects according to a detailed protocol. For the first time it was proved that the course of traumatic hemoperitoneum in patients with gr.I-II of lesion according to AAST of spleen and liver and corresponding to gr.III-IV has no statistically significant differences according to biochemical parameters, intoxication. The experimental study confirmed the hypotheses launched regarding the degree of harmlessness of hemoperitoneum compared to the diagnostic laparotomy in the aspect of the evolution of the adhesion process, intoxication and bacterial translocation. These results allow encouraging non-operative treatment in these patients and avoiding unnecessary surgery.

Class no.

4

MD.71.

Title **HEMOPERITONEUM IN TRAUMATIZED PATIENTS. CLINICAL, IMAGING AND BIOCHEMICAL ASPECTS OF THE EVOLUTION OF TRAUMATIC HEMOPERITONEUM.**

Authors ANESTE Eduard, ROJNOVEANU Gheorghe, GURGHIS

Institution	Radu, TAGADIUC Olga, CIOCANU Mihail, GAGAUZ Ion The Institute of Emergency Medicine , The State University of Medicine& Pharmacology “Nicolae Testemițanu”
Patent no.	Certificat SAIP AGEPI MD seria OȘ 6470 din 08.10.2019 Trauma is one of the causes of premature death and disability. The present research analyzed the role of traumatic hemoperitoneum in the evolution of patients with closed abdominal trauma. Biochemical and metabolic changes induced by traumatic stratified hemoperitoneum after association with lesion degrees according to AAST (gr.I-II vs. gr.III-IV). The results of the research allow optimizing the management of patients with traumatic hemoperitoneum and indication of non-operative treatment in those with hemoperitoneum associated with III-IV degrees of lesion according to AAST of the liver and spleen. Monitoring of hemoglobin degradation factors, nitrosative stress, oxidative stress and intoxication parameters in patients with traumatic hemoperitoneum is missing from the literature. Analysis of the evolution of stratified traumatic hemoperitoneum by degrees of lesion of the spleen and / or liver according to AAST is a scientific novelty.
Description EN	
Class no.	4

Institute of Microbiology and Biotechnology

MD.72.

Title THE STRAIN OF NODULATING BACTERIA *RHIZOBIUM JAPONICUM* RD2, RH. *PHASEOLI* F1, RH. *LEGUMINOSARUM* K2 FOR THE TREATMENT OF SOYBEAN, BEANS AND PEAS SEEDS BEFORE SOWING

Authors Onofras L., Todiras V., Prisacari S., Lungu A.

Institution MINISTRY OF EDUCATION, CULTURE AND RESEARCH, INSTITUTE OF MICROBIOLOGY AND BIOTEHNOLOGY

Patent no. Patent MD 1011, 2387, 3054, 4246

Description EN Efficient biological preparations for the treatment of soybean, beans and peas seeds before sowing have been obtained based on the bacterial strains found by the authors and their cultivation on special nutritive media. The use of bacterial preparations ensures the improvement of the nitrogen fixation capacity in rizobio-root system by 1,3-2,5 times, as well as the accumulation of nitrogen in the soil (50-120 kg/ha during a year) and the increasing of the seed yield by 15,0-24,8%.

Class no. 3.Agriculture and Food Industry

MD.73.

Title Nutrient medium for cultivation of fungal strain *Fusarium gibbosum* CNMN FD 12

Authors Ciloci Alexandra, Tiurina Janetta, Bulhac Ion, Clapco Steliana, Danilescu Olga, Labliuc Svetlana, Dvornina Elena

Institution Institute of Microbiology and Biotechnology

Patent no. Institute of Chemistry
MD 4645, 2020.03.31

Description EN Nutrient medium for the cultivation of fungal strain *Fusarium gibbosum* CNMN FD 12 with the content of corn flour, soy flour, CaCO_3 , $(\text{NH}_4)_2\text{SO}_4$ and water, which contains supplementary, as a biostimulator, the coordination compound of $\text{Fe(III)} - [\text{Fe}(\text{H}_2\text{L}^{1,2})(\text{H}_2\text{O})_3(\text{NO}_3)_3 \cdot n\text{H}_2\text{O}]$ in the following concentration, %: corn flour – 2.0, soy flour – 1.0, CaCO_3 – 0.2; $(\text{NH}_4)_2\text{SO}_4$ – 0.1, $[\text{Fe}(\text{H}_2\text{L}^{1,2})(\text{H}_2\text{O})_3(\text{NO}_3)_3 \cdot n\text{H}_2\text{O}]$ – 0.0010 – 0.0015, water, initial pH of the medium – 6.25.

The technical result of the invention consists in increasing of the biosynthesis of neutral protease by 225.6-247.9% against the prototype and in reducing the producer's duration of cultivation by 24 hours.

Class no. 3 Agriculture and Food industry

Institute of Zoology

MD.74.

Title	Method for the disinfestation and supplementary feeding of hares
Authors	TODERAȘ I., RUSU Ș., SAVIN A., ERHAN D., CIOCOI O., ZAMORNEA M., GROSU Gh., GOLOGAN I.
Institution	Institute of Zoology, Republic of Moldova
Patent no.	MD 1350 Y 2019.07.31 Patent application No: 144/01 as of 24.07.2018
Description EN	The invention refers to protection of cynegetic fauna, specifically, of hares, and is used for their disinfestation both in nature and in zoological gardens. The invention consists in the disinfestation of hares and simultaneously provides them with vitamins, oligoelements and minerals during the cold season of the year and the pre-reproductive period in spring. This allows to ensure their survival, enhance their reproductive potential in natural conditions, and diminish the risk of being captured by predators. The result of invention consists in an enhancement of the therapeutic effect, with 95,5% of hares being cured. The method allows maintaining the hares' reproduction potential in nature. Additionally, this method allows both the food supply and the antiparasitic remedy to be used efficiently and sparingly; it is costless and does not require much effort, therefore, it contributes indirectly to decreasing the number of parasites in nature.

Class no.

1

MD.75.

Title	Installation for ecological and industrial reproduction of pelagophilic fish
Authors	Crepis Oleg, Bulat Dumitru, Usafii Marin, Bulat Denis, Șaptefrați Nicolae, Usafii Adrian
Institution	Institute of Zoology, Moldova Ministry of Education, Culture and Research
Patent no.	MD 1418/2019
Description EN	The invention relates to fish farming, in particular to installations for ecological and industrial reproduction of pelagophilic fish and comprises a spawners capture system , which consists of a rectangular spawner capture tank (7) and a device for spawners displacement into the tank (7); a cylindrical pool (1) with conical bottom (2), with a central drain hole (5), wherein is fixed a vertical perforated water-discharge pipe (4), and water feed

nozzles (3). The installation also comprises a **spawn collection system**, consisting of a rectangular pool (18), wherein are placed spawn collection tanks (22), and a horizontal drain pipe (19), communicating with the central drain hole (5).

The technical result of the invention is to increase the efficiency of reproduction of fish due to new structural elements of the device, by reducing the level of stress and traumatizing spawners, modeling the optimal conditions for incubation of eggs with delicate shells, preventing its trauma and increasing the viability of embryos.

Class no.

3. Agriculture and Food Industry

Institute of Chemistry of Republic of Moldova

MD.76.

Title	Compound 2,5,11,14-tetraazatricyclo- [13,3,1,16,10] -icosa-1 (19), 6,8,10 (20), 15,17-hexaen-3,4,12 , 13-tetraontetraoxime bis (N, N-dimethylformamide) with antibacterial and antifungal activity
Authors	Ureche Dumitru, Bulhac Ion, Lupashcu Lucian, Veverita Anastasia, Bourosh Pavlina
Institution	Institute of Chemistry of Republic of Moldova; Institute of Applied Physics of Republic of Moldova
Patent no.	Patent application No. a 2019 0071, 2019 09 17 The invention relates to chemistry, in particular to tetraoxime 2,5,11,14-tetraazatricyclo- [13,3,1,16,10]-icosa-1(19),6,8,10(20)15,17-hexaen-3,4,12,13-tetraontetraoxime di-N,N-dimethylformamide (TOxC·2dmf) as a polydentate coordination agent for the purpose of obtaining new coordinating compounds with original and supramolecular structure, as well as to microbiology, intended for use as an antibacterial and antifungal remedy.
Description EN	According to the invention, the compound 2,5,11,14-tetraazatricyclo-[13,3,1,16,10]-icosa-1(19), 6,8,10(20),15,17-hexaen-3,4,12,13-tetraontetraoxime di-N, N-dimethylformamide which can be used as an antibacterial and antifungal remedy is claimed.

Class no.

9

MD.77.

Title	The bis-di-p-aminotoluenglyoxime mono-p-aminotoluene trihydrate with antibacterial and antifungal activity
Authors	Ureche Dumitru, Bulhac Ion, Lupashcu Lucian, Roshca Daniel, Bourosh Pavlina
Institution	Institute of Chemistry of Republic of Moldova; Institute of Applied Physics of Republic of Moldova
Patent no.	Patent application No. a 2019 0090, 2019 12 16 The invention relates to chemistry, in particular to dioxime <i>bis-di-p-aminotoluenglyoxime mono-p-aminotoluene trihydrate</i> as a polydentate coordination agent for the purpose of obtaining new coordinating compounds with original and supramolecular structure, as well as to microbiology, intended for use as an antibacterial and antifungal remedy.
Description EN	

According to the invention, the compound *bis-di-p*-aminotolueneglyoxime mono-*p*-aminotoluene trihydrate which can be used as an antibacterial and antifungal remedy is claimed.

Class no.

9

MD.78.

Title **Coordination polymer**
2,6-diacetylpyridinebis(isonicotinoylhydrazonato)(2-)
cobalt(II)–aqua(1/5,75) which manifest adsorptive properties

Authors Danilescu Olga, Bouroush Pavlina, Petuhov Oleg, Bulhac Ion, Shova Sergiu

Institution **Institute of Chemistry, Institute of Applied Physics**

Patent no. **Patent application No. a 2018 0066, 23.08.2018**

Description EN

The essence of the invention consists in the synthesis of new cobalt(II) three-dimensional porous coordination polymer on the base of aromatic hydrazone, with composition $\{[\text{Co}(\text{L})] \cdot 5,75\text{H}_2\text{O}\}_n$ (**1**), where $\text{H}_2\text{L} = 2,6\text{-diacetylpyridine bis(isonicotinoylhydrazonato)}$. The doubly-deprotonated (L^{2-}) ligand shows a new coordination mode and the obtained novel compound exhibits adsorptive properties. The adsorption isotherm of N_2 shows a type-I adsorption behavior, which is the characteristic of microporous and mesoporous materials. The BET (Brunauer–Emmett–Teller) and Langmuir surface areas for compound **1** are $841 \text{ m}^2/\text{g}$ and $878 \text{ m}^2/\text{g}$, respectively.

Class no.

1. Environment – Pollution Control

MD.79.

Title **METHOD FOR CONCENTRATION OF THE ORGANIC COMPONENT IN SUSPENSION FROM RESIDUAL WATERS**

Authors Petru Spataru, Alexei Maftuleac, Igor Povar, Boris Pintilie, Oxana Spinu

Institution **Institute of Chemistry of Republic of Moldova**

Patent no. Patent application: a 2019 0046, 2019.05.31.

Description EN

The invention relates to the biological treatment of wastewater, to processes for the dehydration of active sludge and primary sediment containing predominantly organic substances and can be used in the biological treatment of municipal sewage, as well as in animal farms and agricultural processing enterprises. The elaborated process consists in the joining of two types of solid

waste from water, namely, one with raw sediment and another with active sludge, their mixing rate depending on the nature and concentration of the organic component. Each of wastes is heated up to 40-50 °C, conditions in which both types of meso- and thermophilic microorganisms are active. The wastewater mixture is aerated and then is allowed to clarification (for about 16-18 hours), after which the mineral part is settled and the humic-containing substances are separated. After dehydration and disinfection, this floating mixture can be used as a fertilizer and/or conditioning agent for structure improvement of exhausted soils.

Class no. 1, 14

MD.80.

Title Chlorinated tannins with antibacterial and antifungal properties
Authors Lupascu Tudor, Lupascu Lucian, Duca Gheorghe, Timbaliuc Nina
Institution Institute of Chemistry of Moldova
Patent no. Patent application: a 2019 0042 , 2019.05.22

The invention relates to chemistry, and in particular to obtaining of a compound with antimicrobial properties for use in agriculture against phytopathogenic bacteria and fungi.

Chlorinated tannins, with antibacterial and antifungal properties, are obtained by chlorination processes with 1.5 ... 2.0 l of chlorine gas for 10 ... 20 minutes of 4 ... 6 g polyphenolic compounds extracted from grape seeds dissolved in 40 ... 60 ml methyl alcohol.

Description EN

The chemical compounds obtained as a result of the chlorination process of the polyphenolic extracts from grape seeds were established by recording and analyzing of the FT-IR and NMR spectra of the intact and chlorinated hydrated catechin as well as the intact and chlorinated enotannins.

The antibacterial and antifungal activity of chlorinated tannins was higher, 8 ... 17 times compared to bacteria and 2 ... 3.7 compared to fungi, in comparison to the prior art (Enoxil).

Class no. 9, 3

MD.81

Title Ent-kauranic derivative with selective cytotoxicity.
Authors Kulcički Veaceslav, Gîrbu Vladilena, Pruteanu Elena, Renaud Philippe, Daelemans Dirk, Mollo Ernesto,

Institution	Defranoux Fanny, Ungur Nicon Institute of Chemistry of Moldova Katholieke Universiteit Leuven
Patent no.	Patent application a 2019 0052, 2019.06.21
Description EN	The invention deals with natural product derivatives which exhibit selective cytotoxic properties towards some human cancerous cell lines and can be used as chemotherapeutic agents for treatment of oncologic disorders. In particular, the chemical structure and cytotoxic activity of an <i>ent</i> -kaurenoic acid derivative is described. The parent tetracyclic diterpenoid is available in unlimited ammounts from the wastes of sunflower (<i>Helianthus annuus</i>) processing. More exactly, the structure of the claimed compound can be described according to the chemical nomenclature specific to natural products as methyl <i>ent</i> -17-amino-kauranoate. Its claimed cytotoxic activity is demonstrated on the inhibition of at least 50% of cells multiplication belonging to several tumor cell lines at single digit micromolar and submicromolar concentrations. The reduced toxicity of the claimed compound on normal cells is demonstrated by zebrafish (<i>Danio rerio</i>) toxicity assays.
Class no.	9, 4

MD.82.

Title	SYNTHESIS OF NOVEL CHROMENOL-TRIAZOL HYBRIDS 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, Republic of Moldova
Patent no.	Issued patent MD4505; Granted patent MD4665
Description EN	The essence of the invention includes the first synthesis of 1 <i>H</i> -1,2,4-triazol functionalized chromenols <i>via</i> tandem reactions of 3,3-dimethyl-1-(1 <i>H</i> -1,2,4-triazol-1-yl)butan-2-one with salicylic aldehyde 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. According to the biological testing data, the synthesized compounds showed a high level of antifungal activity

compared to the reference fungicide ketoconazole against *Aspergillus fumigatus*, *Aspergillus niger*, *Penicillium ochrochloron*, and *Trichoderma viride*.

Class no.

4

MD.83.

Title **Iron polynuclear salicylate complex as inhibitor of the proliferation of fungi of the species *Cryptococcus neoformans***

Authors GORINCHOY Viorina, LOZAN Vasile, BURDUNIUC Olga, BALAN Greta, TSAPCOV Victor, GULEA Aurelian.

Institution Institute of Chemistry of Moldova, Republic of Moldova

Patent no. Pending MD patent application:
a2019 0082 (filing day: 2019.11.15)

Description The invention relates to the use of the biologically active iron carboxylate that has high antifungal activity against proliferation of *Cryptococcus neoformans* species and can be applied in medicine and veterinary medicine for the prophylaxis and treatment of mycosis.

EN The essence of the invention consists in the use as fungi inhibitor of the trinuclear iron complex, namely a (μ -oxo)-hexakis(μ -salicylato)-diaqua-(salicylato)-triiron(III) dimethylacetamid-methanol-tetrahydrofuran solvate – hydrate.

Class no. 4, 9

MD.84.

Title **Inhibitor of the proliferation of fungi of the species *Cryptococcus neoformans***

Authors GORINCHOY Viorina, LOZAN Vasile, BURDUNIUC Olga, BALAN Greta, TSAPCOV Victor, GULEA Aurelian.

Institution Institute of Chemistry, Republic of Moldova

Patent no. Pending MD patent application:
a2019 0081 (filing day: 2019.11.13)

Description The invention relates to the use of the biologically active coordination compound of the class of heterometallic carboxylates as inhibitors the proliferation of fungi of the *Cryptococcus neoformans* species and due to these properties can be applied in medicine and veterinary medicine in the prophylaxis and treatment of mycosis.

EN

The essence of the invention consists in the use as an inhibitor of the proliferation of fungi of the *Cryptococcus neoformans* species the heterometallic compound aqua-2κO-tetrakis(N,N-dimethylacetamid-1κO)-tetrakis(μ-salicylato-1κO:2κO')-barium(II)copper(II).

Class no. 4, 9

MD.85.

Title **WATER-SOPLUBLE DICOPPER COMPLEX HAVING SELECTIVE ANTIMICROBIAN ACTIVITY AGAINST MEDICAL AND AGRICULTURAL PATHOGENS**

Authors JOVMIR Tudor, POPA Tatiana, LUPAȘCU Lucian, BĂLAN Greta, BURDUNIUC Olga, GULEA Aurelian, LOZAN Vasile

Institution Institute of Chemistry, Republic of Moldova
Moldova State University

Patent no. MD4663 B1 (2019.12.31); pending applications: a 2019 0026; a 2019 0027

Description EN It was synthesized a series of water soluble mono- and binuclear copper complexes based on ortho-hydroxyaromatic thio(isothio)semi-carbazones. The starting thiosemicarbazone ligands and respective complexes have been tested as water solutions for antimicrobial activity against different bacteria and fungi, relevant for medicine and agriculture.

Among tested compounds copper dimer does manifest a very pronounced antimicrobial activity, while it is selective against Gram(+) bacteria. Mononuclear complexes have a rather low activities. At the same time free starting thio(isothio)semicarbazones does not reveals any significant activity.

Class no. 3, 4

Institute of Genetics, Physiology and Plant Protection

MD.86.

Title	“NISTREANA” RHIZOGENIC INTERSPECIFIC GENOTYPE <i>V. VINIFERA</i> (2N = 38) X <i>M. ROTUNDIFOLIA</i> (2N = 40)
Authors	<i>Dr.hab. Alexandrov Eugeniu, dr.hab. Botnari Vasile, acad. Gaina Boris</i>
Institution	Institute of Genetics, Physiology and Plant Protection
Patent no.	Plant variety certificate No. 753/2019. Patent application No.459/2020.02.17
Description EN	“ <i>Nistreana</i> ”, interspecific genotype <i>V. vinifera</i> L. (2n=38) x <i>M.rotundifolia</i> Michx. (2n=40), which produce early ripening grapes, can be propagated by cutting, without grafting, thus obtaining own-rooted planting material that contributes to reducing the costs of setting up grapevine plantations. The own-rooted interspecific genotype have been officially approved in the Republic of Moldova and, in accordance with the classical uvological and technological principles, are classified a table grape variety.
Class no.	3. Agriculture and Food Industry

MD.87.

Title	Nadejda cultivar soybean (<i>Glycine max</i> (L.) Merrill),
Authors	BUDAC Alexandru, CELAC Valentin, CORETCHI Liuba
Institution	Institute of Genetics, Physiology and Plant Protection, Republic of Moldova
Patent no.	177, MD The Nadejda variety was created by individual selection of the Chisinau 16 x Habarovscaia 53 hybrid. Plant average height – 65-80 cm. Erect growth. Compact bush. Brown pubescence. Height insertion of pods basal – on average 16 cm. Inflorescence: brush, purple flowers. Leaves: yellowish color, hilum – light-brown, mass of 1000 seeds – 120-180 g. Production potential: 3.48 t/ha. Quality traits: protein: 38.9%, fat: 19.5%. Is recommended for all cultivation areas of the Republic of Moldova.
Description EN	
Class no.	3. Agriculture and Food Industry

MD.88.

Title	Method for treating seeds of cucumbers <i>Cucumis sativus</i> L.
Authors	CAUȘ Maria, MD; CĂLUGĂRU-SPĂȚARU Tatiana, MD; DASCALIUC Alexandru INTERNATIONAL EXHIBITS

Institution	Institute of Genetics, Physiology and Plant Protection
Patent no.	MD Nr. 1296 Z 2019.08.31
Description EN	The invention relates to agriculture, in particular to vegetable growing, and can be used for treating cucumber seeds to increase the thermotolerance of the root system of cucumber plants to high positive temperatures in the incipient stages of ontogenesis. The method for treating seeds of cucumbers <i>Cucumis sativus</i> L. comprises immersing cucumber seeds, before germination, in an aqueous solution of 5x10 ⁻⁵ % of extract obtained from <i>Spirogira sp.</i> alga biomass by extraction with ethyl alcohol, at a temperature of 5 °C for 24 hours.
Class no.	3

MD.89.

Title	New garlic varieties s. Vitan
Authors	Dr. Alexei Chilinciuc; dr.hab. Vasile Botnari.
Institution	Institute of Genetics, Physiology and Plant Protection
Patent no.	Patent of <i>varieties No. 300</i> of 2019.12.31
Description EN	Vitan garlic variety. It reproduces vegetatively by planting bulbs and by sowing aerial bulbs. Late-onset varieties. Vegetation period 120-134 days. Planting is done in the autumn. The plants are vigorous, the height of the plant is 95-100cm. Forms a floral stem. The inflorescence forms up to 40 aerial bulbs. The skin of the bulbs is gray-violet, white flesh with a slight taste. The average weight of a bulb is 3.0-7.0g. The weight of 1000 bulbs constitutes 200-300g., depending on the climatic conditions. Total harvest constitutes 8.5-11.0 t / ha., Cargo 8.1-10.5 t / ha., and air bulbs 1.8-2.2t / ha. The variety is resistant to low temperatures, hot and tolerant to the main diseases. It is intended for fresh consumption, the food and processing industry.
Class no.	3

MD.90.

Title	Common winter wheat (<i>Triticum aestivum</i> Desm.), Moldova 66 cultivar
Authors	LUPASCU Galina, GAVZER Svetlana, <u>VEVERIȚĂ</u> <u>Efimia</u> , LEATAMBORG Svetlana, GORE Andrei
Institution	Institute of Genetics, Physiology and Plant Protection,

Patent no.	Republic of Moldova 326, MD
Description EN	The Moldova 66 variety was created by individual selection of the hybrid Line 101 (Cuban 101 x Auriu) x Moldova 7. The variety is part of the Eritrospermum variety. Spike with a length of 10-10,5 cm, cylindrical, with 21-23 spicules per spike. Oval red kernels, the 1000 grains are 50-54 grams. It contains 13.0-14.8% protein and 31% wet gluten. The number of kernels in the spike varies between 60-65. 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. The harvest obtained under conditions of production in the years 2018, 2019 constitutes 5.83-6.32 t /ha (the data of the State Commission for the Testing of Plant Varieties of the Republic of Moldova). It is resistant to falling. Is recommended for all cultivation areas of the Republic of Moldova.

Class no. 3. Agriculture and Food Industry

MD.91.

Title	New Tomato Cultivar - CIREASCA
Authors	Milania Makovei
Institution	<i>Institute of Genetics, Physiology and Plant Protection</i>
Patent no.	CIREASCA - MD 307 2019. 12. 31
Description EN	CIREASCA – Tomato cultivar, cherry type. Early-ripening variety with a short vegetation period (90 to 97 days). Plant with determinate growth, very compact. The leaves are small and light green. The flowers are yellow. The first inflorescence appears after the 5th to 6th node, the next after 1...2. The fruits are small, round, smooth, red-intensive, the surface of the epicarp - glossy. The fruit mass is 10 ... 12g with high taste properties. The fruits contain: 4.8 ... 5.2% dry matter, 4.0 ... 4.5% of sugars, 33.0 ... 34.8 mg /% of vitamin C and 0,28...0,38% of acidity. The total yield is 36.7 ... 37.6 t / ha, while the standard fruit yield is high 93...5 – 97%. It is resistant to the most common disease such as <i>Fusarium</i> , <i>Cladosporium</i> , tomato mosaic virus and resistant to abiotic stress factors – heat and cold temperatures.

Recommendation. The cultivar **Cireasca** are recommended for fresh use, for decorating dishes, preserving

whole fruits, producing juice and other tomato products. It is recommended to be grown in greenhouse.

Application domain - Agriculture (cultivation in private associations farmers and households in individual)

Homologated in Republic of Moldova – 2018.

Class no.

MD.92.

Title

A new variety Auriu 2 of winter durum wheat (*Triticum durum* Desf.)

Authors

ROTARI Silvia, VEVERITA Efimia, LUPASCU Galina,
GORE Andrei,

Institution

LEATAMBORG Svetlana, COINAC Irina

Patent no.

Institute of Genetics, Physiology and Plant Protection
Patent MD 327, 2019. 12. 31

**Description
EN**

The Auriu 2 durum wheat variety was created by intraspecific hybridization between the variety Belii Parus and the variety of our selection Hordeiforme 333. The variety – Hordeiforme. Spike and awns red, white-yellow grain. The spike has a length of 7.2 - 8.0 cm, cylindrical with 24-26 spicules per spike. The oval kernels, the 1000 grains are 46-48 g, contains 30-32.4% gluten and 13.0-15.5% protein. The number of kernels in the spike varies between 45-50. The vegetation period is 262 - 266 days. It is a semi-early variety, with high resistance to fall. The tall height of the plant is 80-82 cm, the twig is 3.0-3,4 stems per plant. Manifest high resistance to drought, wintering and disease (brown and yellow rust, root rot). It is productive with a production capacity of 5.5-6.5 t / ha. The Auriu 2 variety proved to have very good quality indices for the production of pasta. It is recommended to be sown in optimal terms with the seeding norm of 5 million grains per 1 ha.

Class no.

MD.93.

Title

New tomato varieties *Solanum lycopersicum* L. s.
IULIPERUAN

Authors

Dr.Șiromeatnicov Iulia, acad. Jacotă Anatolie, dr. hab.
Botnari Vasile, dr.Cotenco Eugenia, Ciobanu Renata,
dr.Chirilova Eleonora

Institution

Institute of Genetics, Physiology and Plant Protection

EUROINVENT 2020

Patent no.	Patent of <i>varietes No. 189</i> of 2015.07.31
Description	Iuliperuan variety: Early medium, vegetation period 110-115 days. Fruit 90-110 grams, round. The pedicel of the gene with strong articulation. Fruits with fleshy pericarp, contain dry substances 6.5-7.5%, sugar 4,5-6,4%, vitamin C 39,0-55mg, titration acidity 0,29-0,42%. Number of seed troughs 3. Total harvest 45,0-0 55 t/ha, product productivity 40,5-48,0 t/ha and fruit quality 95,6%. It is productive, with high taste, drought-resistant properties, it is recommended to be cultivated in greenhouse and field by growing the seedlings. For fresh consumption, industrialization and preservation. It differs from the standard Elvira variety by resistance to disease and viruses.
EN	
Class no.	3

National Agency for Public Health

MD.94.

Title

A method for identifying of the AgHBs marker in humans blood serum

Authors

Spînu Constantin, MD, DHM, Isac Maria, MD, PhD, Sajin Octavian, MD, PhD, Spînu Igor, MD, PhD, Pînzaru Iurie, MD, PhD, Donos Ala, MD, Tovba Lidia, MD, Suveică Luminița, MD

Institution

National Agency for Public Health

Patent no.

Nr. 9430 from 2019.11.12

**Description
EN**

The invention relates to human medicine, in particular to an original method for identifying viral hepatitis B virus marker (AgHBs) in blood serum and in other body fluids. Following the presence of non-specific factors in these fluids, the final results frequently indicate invalid data. Primary processing of substances intended for investigation for the nominated marker with a mineral suspension leads to the removal of these nonspecific substances. Advantages of the patented method: The proposed algorithm for identifying the AgHBs marker totally excludes the occurrence of uncertain (equivocal) results and essentially enhances the effectiveness of the method manifested by increasing specificity and sensitivity.

Class no.

4

MD.95.

Title

A method for identifying of the anti-CMV IgG marker in humans blood serum

Authors

Spînu Constantin, MD, DHM, Isac Maria, MD, PhD, Sajin Octavian, MD PhD, Miron Aliona, MD, Spînu Igor, MD, PhD, Placinta Gheorghe, MD, PhD, Donos Ala, MD, PhD

Institution

National Agency for Public Health

Patent no.

Nr. 9445 from 2019.12.04

**Description
EN**

The invention relates to medicine, in particular to the elaboration of the method for identification and confirmation of the marker of blood-borne infection, etiologically caused by cytomegalovirus, then used to confirm or deny the clinical diagnosis for scientific or practical purposes. The

essence of the invention is to increase the effectiveness of the method for identifying and confirming the nominated markers by ELISA method using an original algorithm. The proposed method of confirming CMV infection includes preparation of reagent control (RC) and neutralizing control (NC) with their use in the technological process of identifying the anti-CMV IgG marker in ELISA, conducted using a commercial kit. Advantages of the method: high sensitivity and specificity compared to the classical immunoenzymatic method, used as a method prototype, the technology is accessible for the laboratories of the medical units of different levels of medical service, accessible reagents price.

Class no.

4

MD.96.**Title**

A method of identifying and confirming of blood-borne infection marker HTLV1/2

Authors

Spînu Constantin, MD, DHM, Isac Maria, MD, PhD, Sajin Octavian, MD PhD, Miron Aliona, MD, Spînu Igor, MD, PhD, Placinta Gheorghe, MD, PhD, Donos Ala, MD, PhD

Institution

National Agency for Public Health

Patent no.

S20190086 from 2019.07.31

**Description
EN**

The invention relates to medicine and can be used for identification and confirmation of the marker of blood-borne infection etiologically associated with HTLV-1/2 virus in transplant, donors blood, medical contingent, general population and especially in persons at high risk of infection (intravenous drug users, persons undergoing hemodialysis treatment, doctors involved in invasive manipulations, etc.) to reduce the risk of transmission of these infections. The essence of the invention is to increase the effectiveness of identification and confirmation of the marker of infection with HTLV1/2 by the ELISA method, using an original testing algorithm. The method includes the preparation of two additional consumables: control reagent (CR) and neutralizing reagent (NR), obtained from positive anti-HTLV1/2 serum further used as an additional step in carrying out the ELISA test using the commercial anti-HTLV1/2 kit. Advantages: enhancing the effectiveness (specificity and sensitivity) of the anti-HTLV1/2 marker identification assay, especially in persons at high risk of

infection by excluding the influence on the ELISA reaction mechanism, caused by non-specific inhibitors.

Class no.

4

MD.97.

Title

Method of identifying anti-HVE IgG marker in blood serum in persons at high risk of infection

Authors

Iurie Pînzaru MD, PhD, Constantin Spînu MD, DHM, Maria Isac MD, PhD, Octavian Sajin MD, PhD, Veaceslav Guțu, MD

Institution

National Agency for Public Health

Patent no.

MD 1291Z 2019.06.30

Description EN

The proposed method presents an original algorithm for identifying and confirming markers of viral hepatitis E in patients sera, especially at high risk of infection. Following the use of an original technology, the proposed method, carried out in two stages, excludes the appearance of indeterminate (equivocal) results. The first stage, carried out in ELISA, identifies the positive and negative samples; the second stage includes the removal of nonspecific inhibitors from the serum samples, collected from patients with equivocal result by their presumptive processing with a special suspension of mineral substances and repeated examination in ELISA. Calculations based on the optical density estimation index $F1-F2 > 2.0$ allow to qualify the final results only in two categories: positive or negative, excluding the equivocal results. Advantages: the method excludes the appearance of indeterminate results, prevents the need for repeated investigation of patients, who have shown equivocal results, finally increases the effectiveness of the method for evidence the markers of viral hepatitis E, manifested by the significant increase of the specificity and sensitivity of the test.

Class no.

4

MD.98.

Title

Method of acute chemical poisonings diagnosis

Authors

Iurie Pinzaru, MD, PhD, Valentin Gudumac, MD, DHM, profesor, Tatiana Tonu, MD, Kristina Stinca, MD, Constantin Spinu, MD, DHM., profesor

Institution

National Agency for Public Health

Patent no.

Nr. 2010 from 13.02.2020

Description
EN

The invention relates to human medicine, in particular to the original methodology provides the determination of the level of methemoglobin (MetHb), sulfhemoglobin (SHb), oxyhemoglobin (HbO₂) and the summary content of inactive blood pigments for the diagnosis of acute chemical poisonings. Dosage of MetHb, SHb, HbO₂ level and summary content of inactive, blood pigments in the same blood sample from the patient's finger, reduced time to perform the analysis, precision and reproducibility of the method, using of solutions with low negative impact on health, labor productivity with positive economic impact.

Class no.

4

MD.99.**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.100.**Title****Health status of people in risk groups exposed to ionizing radiation****Authors****CORETCHI Liuba, GINCU Mariana****Institution****National Agency for Public Health**

Aim of the project: To establish some particularities of the health of those exposed to harmful radiostressogenic factors and to elaborate the measures to diminish the risks.

Objectives:

1. Dynamic evaluation of the clinical features of pathologies of people exposed to ionizing radiation: participants in reducing the consequences of the Chernobyl nuclear accident (PRCCNA);
2. Estimation of the health status of the PRCCNA descendants of the first and second generation: clinical, cytogenetic and immunological aspects.
3. Elucidation of the cytogenetic mechanisms of the response to the action of ionizing radiation in the PRCCNA descendants.
4. Development of measures and recommendations to reduce the risk of exposure to ionizing radiation on health.

**Description
EN**

Achievements: The clinical investigations indicates that the PRCCNA patients compared with control group, were more susceptible to infections and non-infectious diseases, with the prevalence of large polymorphism of nervous, heart-vascular and gastric-intestinal system, which were accompanied by circulatory disorder of the vegetative nervous system. The immunological analysis reveals alterations in the immune system of the PRCCNA. Cytogenetic research of the lymphocyte cultures of peripheral blood of PRCCNA and their children revealed the deterioration of the hereditary system, being expressed through high level of genomic, chromosomal, and chromatid type aberration. Chromosomal type of aberrations dominated in the adults and chromatid type in the children. On the base of cytogenetic markers, it has been determined that the radiation affection of PRCCNA indicated by the official physical doses not always coincided with the data of the biological indicators.

Applications. The results are useful for assessing the influence of exposure to low doses of ionizing radiation on health.

Advantages. Complex study of the influence of ionizing radiation on human health.

Class no.

4

MD.101.

Title	Radon monitoring in early education institutions and primary, secondary and high school institutions.
Authors	COREȚCHI Liuba, BAHNAREL Ion , Cojocari Alexandra, Gîncu Mariana, Balanel Vasile, Capățina Angela
Institution	National Agency for Public Health
Patent no.	O Nr. 6276 din 31.01.2019 The paper deals with radiological investigations, including the determination of radon concentrations in early education institutions and primary, secondary and high school institutions, including new procedures / methodologies for reducing radon concentrations in schools and kindergartens regarding the use of the ventilation system, evaluation results of radon measurements, methods of calculating the annual average radon level, elaboration of the report on the results of radon measurements, the importance of radon measurements in early education institutions and primary, secondary and high school institutions
Description EN	
Class no.	1, 4

The State Agrarian University of Moldova
Academy of Veterinary Medicine in Vitebsk

MD.102.

Title Process for feeding bees
Authors Eremia N., Chiriac A., Caisîn L., Ivanova R., Maşenco N., Neicovcena I., Mardari T., Cataraga I., Sarî N.

Institution The State Agrarian University of Moldova

Patent no. Patent No. MD 1326 Z 2019.10.31

Description
EN

The invention relates to apiculture, in particular to a process for feeding bees. The process according to the invention, comprises feeding the bees with a mixture of sugar syrup and extract of glycosides dehydroconiferol-9'-O- β -D-glucopyranoside and dehydroconiferol-9-O- β -D-glucopyranoside, in the amount of 1.0 L mixture per bee family, in spring, with an interval of 6 days, before the start of the main collection from white acacia. The use of the elaborated procedure ensures the increase of power, queen prolificacy and increase the productivity of the bee families.

Class no. 3. Agriculture and Food Industry

MD.103.

Title Process for growing bee families
Authors Eremia N., Chiriac A., Caisîn L., Mardari T., Cataraga I., Sarî N.

Institution The State Agrarian University of Moldova

Patent Patent No. MD, nr. 1202 Z 2018.05.31

Description
EN

The invention relates to apiculture, in particular to a process for growing bee families. The process, according to the invention, comprises feeding of bees with a mixture of 50% sugar syrup and an immunomodulating preparation, the mixture is introduced in an amount of 1,5...3,0 l per bee family, 2...3 times in autumn, in September and 1 l of mixture per family, every 10....12 days in spring, from April to the beginning of the main honey flow. The application of the elaborated procedure ensures the increased resistance to wintering, the increase of the queen prolificacy and the productivity of the bee families.

Class no. 3. Agriculture and Food Industry

MD.104.**Title****METHOD FOR TREATING HOOF SKIN PURULO-NECROTIC PROCESS IN COWS****Authors****Jurba V., Krasociko P., Eremia N., Rucoli V., Labcovici A., Kovalev I., Neicovcena I.****Institution****The State Agrarian University of Moldova
Academy of Veterinary Medicine in Vitebsk****Patent no.****Patent No. MD, 1353 Z 2020.02.29.****Description
EN**

The invention relates to veterinary medicine, in particular for treating hoof skin purulo-necrotic process in cows. Summary of the invention consists in that it is carried out the surgical treatment of the pathological defect of the hoof with removal of exfoliated horn and necrotic tissues, and on the surgically treated skin is applied a protective dressing impregnated with a probiotic preparation in the form of a gel based on *Bacillus subtilis* BIM B-497 D with a concentration of 2×10^9 bacteria/ml comprising: suspension with *Bacillus subtilis* BIM B-497 D, carbomer, triethanolamine, sodium benzoate wherein 5.0.....15.0 g of preparation is used per dressing, every 3....5 days, and the course of treatment includes 2....6 dressing. The use of the probiotic preparation based on *Bacillus subtilis* BIM B-497 D with gel allows to simplify, accelerate and increase the therapeutic and economic efficiency of the treatment of purulent sub-dermatitis in cattle.

Class no.**3. Agriculture and Food Industry****MD.105.****Title****METHOD FOR TREATING PURULENT INFLAMMATION OF THE HOOF SKIN IN CATTLE****Authors****Jurba V., Krasociko P., Eremia N., Rucoli V., Kovalev I., Soleanciuk P. Neicovcena I., Coșeleva, O.****Institution****The State Agrarian University of Moldova
Academy of Veterinary Medicine in Vitebsk****Patent no.****Patent No. MD, 1333 Z 2019.11.30.****Description
EN**

The invention relates to veterinary medicine, in particular to the treatment of purulent inflammation of the hoof skin in cows. The method comprises mechanical and surgical

treatment of a hoofs pathological defect, removal of the detached horn and necrotic tissues, with subsequent treatment with antiseptic solutions, drying by plugging and the application of 4 superimposed dressing impregnated with compounds containing silver, copper, zinc and iron, where silver, copper, zinc and iron in dressings are in the following amounts: silver, copper, zinc, iron at the same time, the dressings are applied on the wound once, every 3...5 days, for 15.....17 days.

The use of the elaborated method and the treatment with antiseptic solutions based on bandages impregnated with compounds containing silver, copper, zinc and iron - makes it possible to simplify, accelerate and increase the therapeutic and economic efficiency of the treatment of purulent sub-dermatitis in cattle.

Class no.

3. Agriculture and Food Industry

MD.106.

Title

Process for dehydrating the bedding material with a mineral additive in animal rooms

Authors

Kapitonova E., Eremia N., Kociş I., Korolev D.

Institution

The State Agrarian University of Moldova

Patent

Academy of Veterinary Medicine in Vitebsk

Patent application No. 2029, 2020.03.16.

**Description
EN**

The invention relates to animal husbandry, namely to a process for dehydrating the bedding material with a mineral additive in animal rooms. The process according to the invention includes improving the quality of the products, reducing the pathogenic micro flora and preventing diseases of the limbs of animals (birds), with the aid of the mineral additive (containing in one kg of dry matter: Ca, P, Na, K, Mg, Fe, Cu, Zn, Mn, Co), it is introduced in bulk into the bedding material in the norm of 100 g / m² of floor, granules of 3 ... 5 mm, once a week.

Class no.

3. Agriculture and Food Industry

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

MD.107.**Title**

Pharmaceutical cluster – the engine of the sustainable regional development.

Authors

Victoria GANEA, Patrick RUSU, Alexandru STRATAN

Institution

**Institutul Național De Cercetări Economice al
Academiei De Științe A Moldovei, Chișinău**

Patent no.

Certificat SAIP AGEPI MD seria OȘ 6474 din
08.10.2019

Description EN

For the first time in the Republic Of Moldova was implemented nonoperative tactics of treatment of closed lesions of parenchymal organs, demonstrating the possibility and efficiency of applying TNO and polytraumatize. By applying TNO to traumatizes with compromised neurological integrity it has been shown that the disorder of consciousness is not an absolute criterion for avoiding TNO. Laparoscopy as a way of arguing the successful application of TNO to unconscious polytraumatizations with rather reserved prognosis increased the rate of nonoperative resolution of liver and spleen lesions by 18.1%. Mandatory selection criteria for nonoperative management of closed traumatic lesions of spleen and liver were systematized, the advantages of TNO and the determinants of failure were highlighted. The rational diagnostic-curative algorithm of solving closed liver and spleen lesions was developed through the contemporary opportunity of nonoperative management.

Class no.

14

Academy of Economic Studies of Moldova

MD.108.

Title	EMPIRICAL STUDY ON THE RELATIONSHIP BETWEEN STAKEHOLDER REQUIREMENTS AND THE QUALITY OF INTEGRATED REPORTING
Authors	Cristina Gabriela COSMULESE, Marian SOCOLIUC, Marius –Sorin CIUBOTARIU, Svetlana MIHAILA, Veronica GROSU
Institution	UNIVERSITATEA “STEFAN CEL MARE”, SUCEAVA / Romania ACADEMIA DE STUDII ECONIMICE / Chişinău/ Moldova
Patent no.	Certificat SAIP AGEPI MD seria OŞ 6505 din 02.12.2019

Description EN	<p>In the current economic environment to ensure a sustainable development of the business and achieving a competitive position that coincides with its ability to manage its relations with stakeholders in terms of the distribution of the value added in the global, and to ensure a consensus on the legitimate between them and the company. The main objectives of the work are focused on identifying the reasons that led to increased informational transparency in order to satisfy the demands of the stakeholders, in Contxt RI, on the analysis of the dynamics of the main economic and financial indicators, and the indicators are derived (the result of a database consisting of a total of 180 of the entities listed at the NYSE and NASDAQ for the period of 2008-2017), which has drawn up the practical basis of the model for the assessment of the capacity of the copaniilor to respond to the demands of stekaholders of the persepectiva of the distribution of the added value. The results obtained, it can be very helpful for companies which make use of at present in the integrated reporting and for those who wish to participate in the future, as well as for the shareholders, or the investors, as it offers an opportunity to assess in advance the level of satisfaction of the pretenţilor in relation to company reporting.</p>
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Class no.

14

MD.109.**Title****PENTAGON - REGIONAL DYNAMIC AND REGIONAL MODEL OF EVOLUTION: NEW MODELS OF REGIONAL ANALYSIS****Authors**Victor-Romeo IONESCU, Monica Laura ZLATI,
Valentin Marian ANTOHI, Silviu STANCIU, Svetlana MIHAILA**Institution****UNIVERSITATEA "STEFAN CEL MARE",
SUCEAVA / Romania ACADEMIA DE STUDII
ECONIMICE / Chişinău/ Moldova****Patent no.**Certificat SAIP AGEPI MD seria OŞ 6506 din
02.12.2019**Description EN**

This research presents, for the first time, demonstrating the development of the innovation driven clusters in the EU's neighbouring countries (based on the example of the cluster of pharmaceutical sciences, science) as a solution to the crisis is a tool to increase the competitiveness and development of the region. The economic benefits generated by the clusters serve both the members of the cluster, while they function as a true performing team, but also to the public interest, respectively to the local community. For the local economy, clusters not only increase competitiveness but also income, can provide quality jobs that develop investment in research and innovation and implement effective public policies.

Class no.

14

University of European Studies of Moldova

MD.110.

Title **ATYPICAL MACROECONOMIC SITUATIONS IN THE REPUBLIC OF MOLDOVA. MARKETING RESEARCH STUDY.**

Authors ȘARGU Lilia

Institution "UNIVERSITATEA DE STUDII EUROPENE DIN MOLDOVA" /Chișinău

Patent no. Certificat SAIP AGEPI MD seria OȘ 6473 din 08.10.2019

Description EN The frequent occurrence of atypical situations at the macroeconomic level that threaten long-term strategic planning shows an unstable environment of economic processes in the modern economy. Proper management of atypical situations lies in the ability to identify, classify, and study the nature and factors involved in creating these atypical situations that are increasingly common in a modern market economy. The study of non-standard situations in the Republic of Moldova represents both a scientific innovation with an innovative character and a potential incentive for the development of a new type of management - management of atypical situations. Knowledge of the characteristics of atypical situations that manifest themselves at the macroeconomic level represents a significant support in the process of effectively managing similar situations in other regions or countries of the world.

Class no.

15

D. Ghitu Institute of Electronic Engineering and Nanotechnologies

MD.111.**Title**

The method of oriented growth of single crystals in anisotropic glass-insulated microwires (for example, Bi and Bi-Sn alloys) in a strong electric field.

Authors

Leonid Konopko, Albina Nikolaeva, Ana Kobylanskaya, Gheorge Para

Institution

Ghitu Institute of Electronic Engineering and Nanotechnologies, Chisinau MD-2028, Moldova Republic of

Patent no.

DECISION granting the patent no. 9394 of 2019.10.11

**Description
EN**

The invention relates to the field of materials science and nanotechnology, but more specifically to the possibilities of obtaining a monocrystalline microwire in glass envelope with an arbitrary length and predetermined parameters. The object of the invention is to develop the technology of recrystallization of the microwire in the glass envelope with the final aim to obtain the necessary orientation of the main crystallographic axis C_3 in the microwire. The method according to the invention consists in that the moving microwire is heated to the melting temperature of the core with the formation of a narrow molten zone. The above-mentioned area moves along the microwire motion inside the capacitor, consisting of two copper plates that generate a strong electric field, where by means of the water crystallizer crystallize with the direction of the main crystallographic axis C_3 of the microwire in the direction of the electric field. The developed recrystallization technology in a strong electric field is the main and necessary component in the design of anisotropic thermoelectric energy converters based on a glass-insulated single-crystal microwire made of semimetallic alloys (Bi, Bi-Sn). This technology will allow for one cycle to produce highly sensitive heat flux sensors and anisotropic thermogenerators made from single crystal semimetal microwires in glass insulation.

Class no.

14

MD.112.

Title	Josephson spin valve for cryogenic memory
Authors	Sidorenko Anatolie, Morari Roman, Klenov Nikolai
Institution	Institute of Electronic Engineering and Nanotechnologies, Chisnau, Moldova
Patent no.	-
Description EN	<p>The invention relates to the field of design of base elements for novel supercomputers, but more specifically - to the construction and application of extra low energy consuming switching elements.</p> <p>It is elaborated Josephson spin valve with a weak link in form of a periodic structure composed from ferromagnetic (F) layers spaced by thin superconductor layers (s).</p> <p>Applications: the utilization of the competition and coexistence of superconducting (S) and ferromagnetic (F) correlations in constructed Josephson spin valve provide an increase in the performance and degree of integration of cryogenic memory storage devices and artificial synaptic elements for design of superconducting non-von Neumann computers, such as quantum computers and neuromorphic systems.</p>
Class no.	10

MD.113.

Title	Gas and Pressure Sensors
Authors	Lidia Ghimpu
Institution	„D. Ghitu” Institute of Electronic Engineering and Nanotechnologies
Patent no.	Application submitted
Description EN	<p>This invention relates to the manufacture of gas and pressure sensors based on thin oxide layers. The oxide thin layers were obtained by the RF magnetron sputtering method. Carbon substrates and fiber optics were used in the manufacture of these sensors.</p>
Class no.	1

MD.114.

Title **Thermoelectric vacuum gauge**

Authors Belotercovschii Igori, Sidorenko Anatolie, Condrea Elena, Morari Roman

Institution **Institute of Electronic Engineering and Nanotechnologies, Chisinau, Republic of Moldova**

Patent no. Brevet MD 1321 /2019

Description EN The invention relates to the field of pressure measurement, and can be used for measuring low gas pressures. An experimental prototype of a thermal vacuum gauge has been constructed; the gauge includes an electronic unit and a transducer, the sensitive element of which is a thin insulating film with heating and measuring circuits deposited on the film surface; the latter circuit is implemented in the form of a thermocouple array. To decrease the dependence on ambient temperature, a thermistor is mounted on the transducer case; the thermistor records a change in the temperature, which is compensated for by the electronic unit of the vacuum gauge.

Class no. 5

MD.115.

Title **Procedures for obtaining of semiconductors based on GaN:Mg**

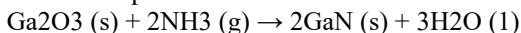
Authors **RUSU Emil, URSACHI Veaceslav, RAEVSCHI Semion, MORARI Vadim**

Institution **Institutul de Inginerie Electronică și Nanotehnologii "D. Ghițu"**

Patent no. **Patent application: No.4618 / 2019**

Description EN The process according to the invention consists in obtaining GaN nanoparticles and nanoparticles with p-conductivity by means of chemical reactions of a chemical compound used as the source of gallium atoms and magnesium acetate $Mg(CH_3COO)_2$, or acetate tetrahydrate of magnesium $(CH_3COO)_2 \cdot 4H_2O$ – as a source of magnesium atoms in the hydrothermal process, at the same time the concentration of the doping element being of (0.4-2.0)% wt. The GaN nanoparticles and nano-microwires with p-type conductivity with high crystallinity and dimensionality at nano-micrometric

level with intense radiative properties having the maximum emission band located at 380 nm. The GaN nanocrystals obtained in this process, in the test result indicated the concentration of gaps in the material of $5.10^{15} \text{ cm}^{-3}$ at $T = 300 \text{ K}$. Mg-doped GaN nanocrystals are obtained by nitriding in 0.3 L/min in ammonia stream (NH_3) of the powdered Ga_2O_3 precursor, maintained at $t = 800\text{-}1000^\circ\text{C}$, for 4 hours in a horizontal furnace. Mg doping is performed by mixing the stoichiometric compositions of the oxides of Ga_2O_3 and MgO in powder form, where after nitridation $\text{Ga}_{1-x}\text{Mg}_x\text{N}$ is formed (where $x=0; 0.5; 1.0; 2.0\%$ at). As a result, p-type conductivity GaN powder was synthesized with 0-2% at. Mg concentration and nanocrystallite size of 100-200 nm. The reaction of formation of GaN nanoparticles by the nitridization process can be described as follows:



Class no.

5

MD.116.**Title****LED Phototherapy Device****Authors**

Iu.Nica, L.Pogorelschii, L.Peev, S.Zavrajnii, V. Dimitriu

Institution

D. Ghiu Institute of Electronic Engineering and Nanotechnologies

Patent no.

Submission date: 2019.02.08, Submission Nr.: 2019 0006

**Description
EN**

The device contains illuminators of different colors, including different colors in one unit, the work regime control unit, which allows the archiving of irradiation regimes from previous procedures, initial diagnoses and subsequent corrections, presenting the information on a liquid crystal display and had built-in power supply. LEDs (Light Emitting Diode) are used as light sources.

Applications The device can be used to perform the phototherapy procedures applicable for treating a wide spectrum of neurological, dermatological conditions, recovery and sports medicine and so on.

Class no.

4

MD.117.

Title	Nanoremediation technology of contaminated soil with residual pesticides
Authors	Anatoli Sidorenko, Tatiana Gutsul, Vladimir Fedorov Ghitu Institute of Electronic Engineering and Nanotechnologies, Chisinau MD-2028, Moldova Republic of
Institution	
Patent no.	Application submitted We observed that in Republic of Moldova new purification methods of water and soil applying nanomaterials are not used. In this context, it is necessary to transfer new synthesized materials and usage technologies to agro-industrial households farms, on which surfaces there are former pesticide storehouses with increased content of POPs - persistent organic pollutants (DDT, Lindan, and etc.).We propose a nanoremediation method .
Description EN	Nanoremediation method is performed in two steps:1. Step - Soil treatment with nanocomposite material, which contains 20 – 60 nm iron nanoparticles, stabilized and fixed on a carrier - activated charcoal or bentonite. 2.Step – Plant seeds treatment with Fe_3O_4 colloidal solution, which will be planted in soil treated with nanocomposite materials described in the I st step, with the purpose of prevention metabolic formations as a result of pesticides destruction
Class no.	1

MD.118.

Title	The magnetic field preliminary method of wheat seeds in the presence of magnetite particles.
Authors	Anatoli Sidorenko, Tatiana Gutsul, Vladimir Fedorov, Coscodan Elena, Shibaev Alexandr, Petrenko Petr
Institution	Ghitu Institute of Electronic Engineering and Nanotechnologies, Chisinau MD-2028, Moldova Republic of
Patent no.	№ 1997 from 26.12.2019 The proposed method consists in treating by a weak magnetic field with an induction of 40-50 T and a frequency of 1-10Hz of wheat seeds an aqueous colloidal solution of magnetite Fe_3O_4 for 3-minutes. The use of the invention allows to increase germination seeds up to 98% -100%,
Description EN	

seedling alignment that can be used in preparation seeds for sowing.

Class no.

3

MD.119.

Title

Fuzzy controlled system for hypothermic brain therapy

Authors

Victor Cojocaru, Teodor Fedorisin, Rihart Galus

Institution

„D. Ghitu” Institute of Electronic Engineering and Nanotechnologies

Patent no.

Application submitted

**Description
EN**

Hypothermia for medical therapeutic purposes can be implemented using invasive methods, if the transfer of heat is directed by a catheter inserted into the femoral vein. It is an efficient method; however, it requires specially designed rooms and patient care by a specialist. There are non-invasive methods involving water/ice applications in the required zone. It is a cheap method; however, the blood temperature in the required area is out of control. For these reasons, a mobile device with elements that can form controlled cooling zones with Peltier elements is required. To reduce the intervention time (which is a major factor in brain attacks), these devices should be mobile to be placed in ambulances. With all the advances in contemporary neurology, the problem of the treatment of cerebral stroke is still not satisfactory solved. Treatment can be successful for most patients only at the initial stages of trauma. A large part of patients is transported to clinics too late, when ischemic trauma is already extended. Therefore, the priority objectives for this device are to equip the doctors from the emergency hospitals with the technology and equipment required to deliver the aid as fast as possible

Class no.

4

**Junior Achievement Moldova
IPLT,,Universul,,**



AO. AECS. MD.

Nicu Frumusache

School Admission-tracking

My name is Nicu and my invention is a prototype called “School Admission-tracking”. This invention is a program in which you can input the names and grade of every single student in a school and then check their presence. The purpose of this program is to make the process of registering absences easier for the students and school faculty. “School Admission-tracking” is also going to be accessed from a website which will allow parents to see their children’s records. This invention has been forwarded to be patented.

Nichita Levandovici

Mop-Flat & Drone-clean.

My name is Nichita. My invention is a prototype called “Mop-flat”. “Mop-flat” is a robotic mop with a remote controller. Its purpose is making cleaning much easier without putting a lot of physical effort in it. I created this invention with disabled people, people who are in a wheelchair and elderly people in mind. “Mop-flat” has been forwarded to be patented.

Another invention of mine is a prototype called “Drone-clean”. This invention is a flying drone. The drone has some particular cleaning supplies attached to it in order to be able to be used as a cleaning device. This way cleaning the house is not only easier but also fun and entertaining. “drone-clean” was created for people with disabilities and people who are in a wheelchair. The invention has been forwarded to be patented.

Cristina Ursu

Magno-glasses

My name is Cristina. My invention is a prototype called “Magno-glasses”. This invention is a pair of glasses that have therapeutic magnets in them. The magnets help prevent headaches, migraines and spasms from acute neuroticism by increasing blood flow to the brain . It keeps tiredness at bay and also makes a pretty stylish accessory. “Magno-glasses” has been forwarded to be patented.

Daniela Buga

Shoes-darf & Snakeling

My name is Daniela. My invention is a prototype called “Shoes-darf”. “Shoes-darf” is a dual shoe that can transform from a casual footwear to a more classical leather one. It uses zippers to facilitate the switch. This invention also has black peppers and other medicinal plants and oils in its sole. The peppers create an anti inflammatory reaction while giving the foot a massage and the herbs and oils combat the sweat and smell. “Shoes-darf” has been forwarded to be patented.

Another invention of mine is a prototype called “Snakeling”. “Snakeling” is a series of jewelry out of real snake skin. They were made using my pets shed skin. The jewelry has a variety of design and colors each unique in it’s own way. Another component of “Snakeling” is the presence of healing magnets which help combat pain, inflammation and anxiety. The invention has been forwarded to be patented.

Olga Surugiu

Raw-doll

My name is Olga and my invention is a prototype called “Raw-doll”. It is a toy doll for children of all ages that is made out of organic straws. The doll also has medicinal plants and essential oils which come in different smells such as mint, lavender and lemon balm. These essential oils help in calming down the child and boosting it’s immunity.”Raw-doll” has been forwarded to be patented.

AO. JA. MD.

Adelina Bivol*K-shirt*

My name is Adelina. I'm 9 years old. I have been attending international competitions for 2 years. This year I invented a transforming coat. It can change into a stylish satchel that any girl or boy would love. I created this product with my brother, Fabian in mind. The magic behind the switch consists in magnets. These magnets have healing properties, they increase blood flow to any area of the human body that needs it. The invention itself is called "K-shirt" and it is a prototype that's being forwarded to obtaining a patent for the invention.

Sara Simionel*Klam-girl*

My name is Sara. I'm 9 years old. I have been attending international contests for 2 years. My invention is called "*Klam-girl*" and is in the prototype stage. These clams are based of various cute animals that have been invented by me. The design of the jewelries has been forwarded to obtaining a patent by "AGEPI Moldova". It contains therapeutic magnets that can ward off against migraines and tension headaches, improve logical and critical thinking by bettering the blood flow to those areas. This product is aimed for consumers of all ages be it a child or an adult.

Daria Damian*IMAK-DAM*

My name is Daria. I'm 9 years old. My invention is a prototype called "*IMAK-DAM*". It is a series of necklaces and bracelets which are unique and personalised to it's wearer. The drawings and the overall design has been patented by "AGEPI Moldova". Another feature of the neck-wear is that it has magnets which increase the blood flow to your brain and in some cases can be used as an alternative treatment to depression. The bracelet also contains magnets which promote the healing of arthritis and other wrist injuries.

Marius Scortescu*Solar-Stand*

My name is Marius. My invention is called „*Solar-Stand*". It is a multi-functional, informative solar panel. The invention is a prototype project extension of a previous inovation and it has been forwarded to be a registered patent. The way it works is that during the day it gathers energy from sun light. This energy is deposited and then used during night time.

The accumulated energy also allows the stand to rotate to create a well lit atmosphere. It is aimed at people of all ages who are even a bit self-conscious about the environment.

Alexandru Boaghe

Kup-sol

My name is Alexandru. My invention is a prototype called „*Kup-sol*”. This invention is a cup with solar panels. The energy gathered from the panels is used to keep the liquids inside of it warm. It is a free and renewable type of energy that accomplish it's purpose without harming the nature. This invention has been forwarded to be patented.

Beatrice Tanas

Magno-school-toy

My name is Beatrice. My invention is a prototype called „*Magno-school-toy*”. „*Magno-school-toy*” is a satchel, pencil box and a toy aimed at pupils and students. The invention is a convenient portable product which has magnets in it's components. The therapeutical magnets help with a problem which is rampant throughout pupils - scoliosis and back problems. Aside from healing back aches it also can help treat migranes and head aches. „*Magno-school-toy*” has been forwarded to be patented.

Bogdan Gorceac

S-Student-Box

My name is Bogdan. My invention is a prototype called „*S-Student-Box*”. This invention represents a case which is separated in different compartments. In one section you can store copybooks, pens and pencils. In another section you can keep your electronic devices and even charge them. „*S-Student-Box*” is the product through which you can use ecological energy to recharge your gadgets. This innovation has been forwarded to be patented.

Paula Rubanovici

Dual-H

My name is Paula. My invention is a prototype called „*Dual-H*”. „*Dual-H*” is a dual hat. This hat can be worn on both sides. It is a warm, stylish and impermeable hat. Another way it can be useful is by having healing magnets etched into it. Because of their location the brain of the wearer has better blood flow which facilitates increased problem solving abilities and overall cognitive improvement. As part of its design „*Dual-H*” also has a pair of cute animal ears. This innovation has been forwarded to be patented.

Ion Levinta*Smart-House*

My name is Ion. My invention is a prototype called „Smart-House”. This invention is a program or more exactly an app that connects your phone to the gates and doors of your house. This app allows you to connect, open or close your gate or door without even getting up. „Smart-House” was created with drivers and busy people in mind. The invention has been forwarded to be patented.

Ion Ujavca*Contry MAIL*

My name is Ion and my invention is a prototype called „Contry MAIL”. This invention is a program that allows people to contact and visualise a person online. I made this because i wanted to create a better way to communicate with my fellow colleagues. „Contry MAIL” has been forwarded to be patented.

Tudor Axiutin*T-port*

My name is Tudor. My invention is a prototype called „T-port”. „T-port” is a little programed robot that can dance and hold things. This robot can provide children with lots of happiness and entertainment. This invention has been forwarded to be patented.

Chironeț Madalina, Chironeț Cătălin*Pointy game*

Our name is Madalina and Catalin. Our invention is a prototype called „Pointy game”. This invention is a game out of recyclable plastic cans and ropes. The game is played by players answering general science questions. By answering right the player has to step on the cans, hold the ropes and hop forward.”Pointy game” was created as a fun way for us and our classmates to spend their time away from gadgets while learning something new and being eco-friendly. This invention has been forwarded to be patented.

Teodor Lozinschi*Game-hor*

My name is Teodor. My invention is a prototype called „Game-hor”. „Game-hor” is a program for your telephone. This program is a game with animals and colors. It is a fun way to spend your time. „Game-hor” has been forwarded to be patented.

Philippines

by Manila Young Inventors Association / Farin Technologies

PH.1.

Title

VIGORION

Authors

Iman Hadi Vincheh, Ma. Chat Donna V. Oflias

Institution

MYIA / Farin Technologies

Description EN

An energy efficient solution is provided to infiltrate the air through an innovative cyclone sweeper to infiltrate air and destroy airborne viruses and bacteria through an innovative, responsive negative ion dispenser that adjusts to the air stream dynamically to ensure the maximum and uniform ion delivery including an activated carbon filter which is replaceable and an Ultra Violet C light is used to kill the viruses and bacteria trapped in the filter. The system has a sound proof usage to the hospital and classrooms through a scalable product design. Creating a healthy environment, providing a clean fresh air without viruses, bacteria, fungi, allergens, pollutions and particles with a system that is energy efficient, silent and dependable. With the health benefits of the negative ions, we will increase efficiency at work and better moods at home. As this system can trap and kill viruses, it helps fighting against COVID-19.

Class no.

1

PH.2.**Title****OZPATIC****Authors**

Kristhia Cayle F. Lastra, Trixie D. R. Abulencia, Mhykaela R. Caluya, John Luis L. Tolentino, Ma. Chat Donna V. Ofilas

Institution**MYIA / Farin Technologies****Description EN**

Air pollution has been considered a hazard to human health – specifically suspended particulate matter (SPM). According to the World Health Organization (WHO), exposure to SPM causes respiratory and cardiovascular morbidity, such as aggravation of asthma, respiratory symptoms, mortality from cardiovascular diseases and from lung cancer. The objective of this study is to be able to create an effective air filter for treating SPM concentration in indoor air from a Cockcroft-Walton voltage multiplier and Golden Pothos (*Epipremnum aureum*). A low-energy consuming fan and a grounded metal mesh were also installed in the filter. The initial SPM concentrations in a room were measured and recorded. Results show that the numbers of days the filter was left in the room and the SPM concentration are inversely proportional; less SPM concentration is present as time progresses. In conclusion, the usage of a Cockcroft-Walton voltage multiplier and utilization of a Golden Pothos (*Epipremnum aureum*) in creating an electrostatic air filter proved to be effective in reducing suspended particulate matter (PM 2.5 and PM 10) in the indoor ozone of a conventional household room improving indoor air quality as a result.

Class no.

1

Poland

Represented by **Eurobusiness-Haller**

PL.1.

Title

Oxide nanostructures by ALD and hydrothermal methods for photovoltaic applications

Authors

Marek Godlewski, Monika Ożga, Rafał Pietruszka, Bartłomiej Witkowski

Institution

Institute of Physics of the Polish Academy of Sciences

Patent no.

Polish patents: PL227817, PL226487, Appl. P.429066

**Description
EN**

The application concerns innovative solutions based on oxide nanostructures that have huge application potential in the photovoltaic industry. In particular, the proposed solution has 3 basic applications:

1. Three-dimensional transparent electrodes for use in different generations of PV cells. The electrode is a combination of ZnO nanorods obtained by a very cheap and simple hydrothermal method and doped ZnO layers obtained by the ALD method. The electrode is characterized by high transparency and high electrical conductivity. Due to the use of nanorods (roughness in the nanometer scale), the amount of reflected light has been reduced, which directly translates into an increase in cell efficiency. In addition, the electrical contact to the electrode is aluminum, which compared to silicon cells, where the electrical contact is silver, will reduce costs. The solution can be used in various types and generations of solar cells.

2. Anti-reflective layers reducing the amount of reflected light. The solution is to choose the order, as well as the type and thickness of subsequent nanolayers, using the difference in light reflection coefficients. This type of solution is also a protective barrier, e.g. against moisture.

3. Innovative technology for the growth of CuO layers by means of a very simple, cheap and fast hydrothermal method. CuO layers have long been a very intensive area of research for many scientific centers, as a potentially active layer (ie. as alternative to CdTe layers). Until now, technology has been the main barrier in the application of CuO layers. The developed technology allows controlled growth of CuO layers from an aqueous solution at low temperature. Research is still in its early stages, but the results are very promising.

Class no.

2

INTERNATIONAL EXHIBITS

PL.2.**Title****WAXO – Innovative wax analyzer****Authors**

Mariusz Gagoś, Marek Pietrow, Jan Wawryszczuk

Institution

- 1) Department of Cell Biology, Institute of Biological Sciences, Maria Curie-Skłodowska University
- 2) Department of Material Physics, Institute of Physics, Maria Curie-Skłodowska University

Patent no.

Patent application number P.429877, P. 429878 and P. 429881

The subject of the invention is a portable electro-mechanical device allowing the wax analysis, e.g. beeswax, for the presence of added impurities. The device allows you in quickly and at the same time cheap way to determine the quality of beeswax tested for the presence of artificial admixtures and assess its usefulness, in particular in beekeeping.

The rule of working the device was described in three international patent applications.

The problem of falsification is important because beeswax, immediately after honey, is one of the most important bee products used not only in beekeeping, but also in many industries, including dyeing, armaments, metallurgical, pharmaceutical or cosmetic.

The innovative device is mainly aimed at the beekeeping environment, as due to widespread falsification of bee wax, there is a need for a method that can distinguish natural wax and modified its in a fast and cheap way. The falsification of wax has become widespread as there are no procedures requiring routine control of the quality of wax as a raw material introduced to the market. The growing awareness of the problem has created the need to control beeswax present on the market. Currently, commonly used wax quality assessment methods consist of organoleptic evaluation or analysis using gas chromatography combined with GC-MS mass spectrometry, FTIR infrared spectroscopy, DSC scanning calorimetry. These are costly methods and require samples to be delivered to laboratories where measuring devices are located. WAXO gives you new opportunities, at an affordable price, available to everyone.

The design process of the device consisted in creating a system that penetrates directly into the sample and obtains information on its physico-chemical properties, which allows to establish a similarity to natural wax.

The device is at TRL9.

Description EN

Class no.

1,4

Poland

Represented by

Association of Polish Inventors and Rationalizers

Stowarzyszenie Polskich Wynalazców i Racjonalizatorów. SPWIR

PL.3.

Title

Fast-Responsive and Highly Sensitive Molecular Fluorescent Markers for Imaging of Structure in Live-Cell Dynamics and Structure at the Single-Molecule Level

Authors

Joanna ORTYL, Monika TOPA, Anna CHACHAJ-BREKIESZ, Karolina DZIĘCIOŁOWSKA, Patryk SZYMASZEK, Wiktor KASPRZYK, Tomasz ŚWIERGOSZ, Dominika KROK, Magdalena JANKOWSKA, Filip PETKO, Patrycja ŚrodaMariusz Galek

Institution

Tadeusz Kościuszko University of Technology

Patent no.

-

Description EN

The invention relates to the development of new fluorescent dyes that are 3- (2-pyridyl) chromen-2-one derivatives that are successfully suitable for biological research using fluorescence or confocal microscopy. The developed fluorescent dyes penetrate inside the cells through the cell membrane and, what is extremely important from the application point of view, selectively combine with specific cell structures and simultaneously emit fluorescent light of a specific color (i.e. a specific wavelength). The use of developed 3- (2-pyridyl) chromen-2-one derivatives as the role of fluorescent dyes allows the labeling of individual cell organelles and the monitoring of chemical processes inside the cell in-situ and on-line. Thus, the use of these sensors for imaging cellular organelles can be a breakthrough in medicine. It may contribute to the early diagnosis of cancerous changes and reduce the resection of healthy tissues during surgical procedures.

Class no.

PL.4.**Title**

An Ultrasensitive Fluorescence Sensors for the Rapid and Selective Detection of Heavy Metal Ions in Drinking

Authors

Joanna ORTYL, Monika TOPA, Anna CHACHAJ-BREKIESZ, Patrycja Środa, Patryk SZYMASZEK, Wiktor KASPRZYK, Tomasz ŚWIERGOSZ, Dominika KROK, Magdalena JANKOWSKA, Filip PETKO, Karlina Dzieciolowska, Mariusz Galek

Institution

Tadeusz Kościuszko University of Technology

Patent no.

-

Description EN

The subject of the invention is new high-performance fluorescent chemosensors, which can be successfully used for rapid and selective detection of selected heavy metal ions such as Hg^{2+} , Hg_2^{2+} , Fe^{2+} , Fe^{3+} , Sb^{3+} , in tap water or sewage and other environmental samples. This is extremely important because even small amounts of toxic elements in environmental samples can cause irreversible reactions in the human body. For example, chronic antimony poisoning can lead to dermatological, cardiological or even mutagenic changes. In addition, exceeding the iron level to 0.3 mg / l causes clouding and browning of the water, staining on washed underwear. The increased iron content also promotes the growth of filamentous ferruginous bacteria, which is a significant technological problem due to the possibility of clogging the water supply network with dying microorganisms. That is why it is so important to monitor the concentration of various elements in drinking water and other environmental samples. New fluorescent sensors are selectively responsible for binding to a given metal and what is more, they are characterized by significant changes in their emission properties during binding with specific ions. New high-performance chemosensors are sensitive to even small changes in the concentration of selected metal ions. Then the color change of the sample (bathochromic or hypsochromic shift) or weakening or strengthening of fluorescence intensity is observed.

Class no.

PL.5.**Title**

New highly efficient visible light photoinitiators for photo-curable polymer-based materials in coating printing industry and additive manufacturing technologies

Authors

Joanna Ortyl, Emilia Hola, Wiktoria Tomal, Anna Chachaj-Brekiesz, Maciej Pilch, Dominika Krok, Magdalena Jankowska, Alicja Gruchała

Institution

Cracow University of Technology

Patent no.

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Description EN

The most modern technologies for producing polymeric materials are based on photochemically initiated processes. The photopolymerization of monomers is gaining popularity as an environmentally, friendly and safe method for production of the protective polymer coatings on various surfaces. Photoinduced processes are also used in the most modern technologies applied for the production of polymeric materials for example in additive manufacturing, especially in stereolithography (SLA), which is the most versatile 3D printing technique. The growing interest in photopolymerization prompts the search for new types of high-efficiency photoinitiating systems, because their properties determine the efficiency and speed of polymerization. The low toxicity, cheapness, speed, control of formulation and operation are some of the main advantages of this growing technology. Currently, it is very important that the new initiating systems allow operation using ultraviolet (UV) and visible (Vis) light in the field of emissions of UV-LEDs and Vis-LEDs. The new terphenyl and biphenyl derivatives were synthesized and proposed for the role of sensitizers of the iodonium salt during photopolymerization processes upon exposure to UV and visible light – LEDs 365nm, 405nm and 420nm. Developed bimolecular initiating systems can be used for different types of photopolymerization, cationic ring-opening photopolymerization of epoxides, free-radical photopolymerization of acrylates, thiol–ene photopolymerization and for synthesis of interpenetrating polymer networks (IPNs).

PL.6.**Title**

Additive to the drilling mud and the method of reducing biodegradation process

Authors

Anna Turkiewicz, Piotr Kapusta, Joanna Brzeszcz, Teresa Steliga

Institution

Oil And Gas Institute – National Research Institute

Patent no.

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Description EN

The essence of the subject referred to as a “Additive to the drilling mud and the method of reducing biodegradation process” is description of a solution for limiting the biodegradation of waterbased polymer drilling mud under the influence of synergistic interaction of biocides, during drilling of exploration wells or storage of a this substance. The use of synergistic interaction of effective mixture (biocides) contributes to the elimination of biogenic contamination of drilling fluid, limits the development of microorganisms and prevents the formation of the biofilm layer. An additional advantage of the invention is to maintain the rheological parameters of drilling mud in the long term, which increases its resistance and time of use in the borehole. As a result of the application in drilling process it does not occur formation of biogenic sediments and conglomerates form, thanks to which are maintained the correct density, viscosity and structural durability of drilling mud. The use method eliminates the possibility of occlusion of filters and initiating the biocorrosion process of tanks and equipment dispensing drilling liquid. The object of the invention is to create an additive for the drilling fluid and the method of its use to limit the biodegradation. The method enables effective protection of drilling against biodegradation processes, as well as contributes to the elimination of accidental biogenic contamination, e.g. introduced with process water.

PL.7.**Title**

Composition of the aluminous cement slurry for sealing
Marcin Kremieniewski, Marcin Rzepka, Ewa Kałna,
Miłosz Kędzierski

Authors**Institution**

Oil And Gas Institute – National Research Institute

Patent no.

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Description EN

The essence of the subject is the slurry recipe that, due to the lowered density of the obtained composition, can be used when sealing holes drilled in the profile of poorly cohesive rock and detached rock, in a zone of low depositional pressure, as well as for reconstruction work when sealing directional, horizontal, and vertical holes. The particular advantage of this invention is that it achieves relatively high early compressive strength values while maintaining a low slurry density, which is an extremely difficult condition to achieve. One of the factors that allow to shorten the time of early hydration of cement slurry is the invention of a recipe based on aluminous cement. However, due to the unique conditions for the setting of such a hydraulic binding agent as well as the presence of additional agents in the slurry that are necessary to regulate the slurry's parameters other than the setting time, it is necessary to precisely determine the quantitative and qualitative composition of the invented recipe. What is more, the main hydraulic binding agent, i.e. aluminous cement, should be characterized by a proper content of aluminum. Designing a recipe with precisely determined quantitative and qualitative values of individual ingredients, additives, and admixtures contributed to the creation of the composition of the aluminous cement slurry for sealing.

PL.8.**Title**

Natural gas measuring and billing system

Authors

Zbigniew Gacek, Jacek Jaworski, Jacek Matusik, Paweł Kułaga

Institution

Oil And Gas Institute – National Research Institute

Patent no.

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Description EN

The subject matter of the invention is a measuring and

INTERNATIONAL EXHIBITS

billing system that includes at least two measuring lines with valves and gas meters of different flow capacity. The valves are provided with drives and a control unit that switches between the measuring lines in such a way that each of them operates within strictly defined flow ranges, and if these are exceeded, the flow is automatically switched to the second measuring line. The measuring ranges of both measuring lines overlap in the range of Q_{min} to Q_t of the measuring line with the higher flow capacity. During normal operation, only one of the measuring lines will work, while the switching to the second measuring line will take place when it has been determined that the current gas volume flow is at the limit of the measuring range or when the metrological properties in the concerned gas flow range for the second measuring line are better. For the purpose of switching between the measuring lines, drives have been used that are controlled by a system of autonomous valve control based on the actual flow data of the gas meters (based on the data from the gas meter pulse transmitters). The developed solution allows to significantly increase the rangeability of a measuring system – for example, by using two measuring lines with turbine gas meters with a rangeability of 1:20, it is possible to obtain an automatically controlled system with a rangeability of 1:200.

PL.9.**Title**

Corrosion inhibitor for gas pipelines and extraction equipment protection

Authors

Michał Pajda, Jan Lubaś, Wojciech Krasodomski, Barbara Gaździk

Institution

Oil And Gas Institute – National Research Institute

Patent no.

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Description EN

The invention subject consists of a corrosion inhibitor for gas pipelines and extraction equipment protection, designed for corrosion protection against acidic agents, such as H_2S and CO_2 , and additionally it protects extraction equipment against inorganic deposits precipitation from the reservoir water and depositing in the form of scale. The new composition is characterised by formation on the metal surface of a permanent layer

protecting against action of acids and chlorides from the water phase, and against action of acidic gases from the gas phase, so-called film forming inhibitor. The inhibitor composition shows also properties of preventing inorganic deposits formation and excellent low-temperature properties, facilitating its storage under winter conditions. The inhibitor composition is a mixture of liquid corrosion inhibitors, dispersants, and other surfactants in alcohol-glycol-water solvents. The effect of individual components synergism increased the inhibitor capacity a few times as against widely used corrosion inhibitors. With reservoir waters the inhibitor forms homogeneous liquids. No phenomenon of inhibitor precipitation from them was found. Exceptional inhibitor, according to the invention, compatibility with reservoir waters of various salinity degree results in increasing its anti-corrosion properties, both in the water and in the gas phase, and it is effective already at a low dosage of 10 to 100 mg/kg to reservoir water.

PL.10.**Title**

Clinical Trials Assistant - Sensory system for supervising clinical medical trials supporting analysis of the neurological diseases treatment efficiency.

Authors

Mariusz Chmielewski, Tomasz Prokopowicz, Paweł Pieczonka, Tomasz Gutowski, Damian Frączczak, Dawid Bugajewski, Sylwia Sławińska, Piotr Witowski, Monika Lipińska

Institution

Military University of Technology

Patent no.**Description EN**

Commercial (used by IQPharma) mobile sensory tool for remote supervision of clinical trials of drugs using a set of wireless biomedical sensors supporting assessment of neurological disorders' movement and muscle symptoms (epilepsy, Parkinson's disease, spontaneous tremor, convulsions, etc.). Clinical Trials Assistant is an innovative solution offering support for the neurological symptoms intensity evaluation and analysis as well as disorder diagnostics and clinical trials assistance. The system consists of a management server, a biomedical wireless multisensory (smart medical band) and a dedicated mobile application, allows for daily diagnostics of the intensity of

symptoms of neurological diseases, including tremors, dyskinesia, convulsions, seizures and other symptoms of myopathies or neurological pathologies. Diagnostics in correlation with the conducted drug therapy allows for the assessment of the patient's health condition and is able to support the drug and dosage recommendation in therapies by evaluating their effectiveness. The CTA system allows for configurable user survey with simultaneous sensory examination, the main purpose of which is to determine objective parameters of the patient's appropriate time regimes automatically, often unknowingly for the user - excluding the possibility of inaccurate assessment of the health condition. The use of inertial sensors and electromyography permits to develop an innovative technique for assessing the intensity of symptoms of neurological diseases (in patenting). The analysis of movement disorders of limbs, muscular system, perception tests and reactions on the phone screen allows to assess the patient's condition and mood in many aspects, and thus objectively determine the need for neurological drugs intake. The use of telemedicine and mobile devices provides mechanisms of cheaper, more precise and effective research, difficult to falsify and objectified by quantitative analysis tools. The system offers a number of analytical functions supporting the patient in the assessment of neurological disorder advancement, which is an important aspect of alarming about situations threatening the patient's life and health. The product offers continuous analysis of patient's health by monitoring the symptoms of neurological diseases using biomedical wireless technologies. Built-in mechanisms for extraction of IMU and EMG signal features and machine learning decision algorithms, evaluate the intensity of neurological symptoms based on the obtained diagnostic and symptomatological data, assisting the physician in the analysis and final recommendation of targeted drugs and their dosages. Consequently, CTA is an ideal tool to support physicians, researchers and patients in the supervision and treatment of selected neurological disorders in the correct diagnosis and selection of effective mono or poly therapies.

PL.11.**Title**

NERVE - biomedical system for monitoring epilepsy and assessing the effectiveness of medical treatment of children suffering from epilepsy

Authors

Mariusz Chmielewski, Sylwia Sławińska, Piotr Witowski, Filip Głowacki

Institution

Military University of Technology

Patent no.

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Description EN

NERVE is a system composed of miniature biomedical multisensory (actigraph, electromyograph), a mobile emergency and treatment application and a central knowledge base. Neurological Environment for Recognition and Verification of Epilepsy is a sensory mobile system for the monitoring and support of epilepsy treatment for children. System provides functions for seizure monitoring, diagnosis and disease monitoring, assessment of drug therapy effectiveness. The product offers continuous child protection by monitoring possible epilepsy seizures on parents' devices with the use of wireless technology. The system offers very detailed recording and reporting of seizure characteristics and allows for a caregivers to provide postictal questionnaires and descriptions of seizure characteristics, complementing the symptomatology. Built mechanisms of sensory signal analysis and decision algorithms evaluate the intensity and type of seizure on the basis of the obtained diagnostic and symptomatological data - supporting the medical staff in the analysis and final diagnosis. The mechanisms contained in the system allow us to assess the effectiveness of pharmacological therapy, taking into account also a set of epigenic factors (mood, diet, changes in the environment), which is the most challenging aspect of children with epilepsy monitoring. As a result, NERVE is an ideal tool to support parents and caregivers in the supervision and treatment of children suffering from epilepsy as well as doctors in the correct diagnosis and selection of effective mono or polytherapy.

PL.12.**Title**

Intelligent biomedical clothing analyzing physiological

INTERNATIONAL EXHIBITS

	state, endurance and training efficiency using advanced biomedical sensors, analytical methods and artificial intelligence.
Authors	Mariusz Chmielewski, Tadeusz Sondej, Piotr Sprawka, Robert Gromada, Michał Sobolewski, Jakub Sierżęga, Jakub Nowakowski, Jakub Rzepiński, Karolina Marciniak, Łukasz Skwarszczow, Mateusz Janowski, Agata Pietraszko
Institution	Military University of Technology, NutPro sp. z o.o.
Patent no.	-
Description EN	<p>Innovative smart clothing integrated with an advanced wireless biomedical data analysis module and a mobile application supported by analysis web portal. The system offers the first such a wide spectrum of analysis not only of endurance sports, but also strength and performance sports, giving a full picture of physiological reactions of the human body. Such a wide spectrum and accuracy of biomedical signal acquisition has been combined with the ergonomics and convenience of long-term use of specialized, breathable sportswear supervised by modern electronics and an analytical mobile application. The comprehensive monitoring system combines multi-channel electrocardiography and electromyography, motion, body temperature and sweating analysis to precisely analyze user's physical activity biochemical processes. The use of specialized biopotentials measurement techniques and long-term research on human physiological patterns allowed the team to develop the knowledge base of the system, integrated within the mobile application, capable of effort physiology analysis and identification of positive and negative health events. By combining the analysis of physiology, the system introduces new functions for the evaluation of performed trainings as well as undertaken regeneration of the body in order to provide a more complete and precise analysis of the user's physiology. The system provides proprietary algorithms for the analysis of biomedical and inertial signals used to assess energy expenditure, training quality and activity, taking into account the dynamic parameters of the heart, chest and back muscles, rhythm of movement, temperature dynamics and skin conductance - allowing for the</p>

recording and analysis of complex power and performance training. The system uses developed training patterns and collects user workouts to calibrate and parameterize the system for a given user, preparing proposals for optimizing the used training program. An important element of the system's functionality is its own mechanism of determining training and health events using analysis of high-resolution multichannel ECG (4) and EMG (4), skin conductance and actigraphy determined from recorded inertial signals.

PL.13.**Title**

Analytical and decision support services in the domain of countering mass destruction threats in WAZkA system.

Authors

Zbigniew Tarapata, Andrzej Najgebauer, Ryszard Antkiewicz, Dariusz Pierzchała, Wojciech Kulas, Jarosław Rulka, Mariusz Chmielewski, Rafał Kasprzyk, Michał Dyk, Krzysztof Chlebicki, Krzysztof Mierzejewski, Damian Frąszczak, Krystyna Więcka, Olena Kuzmenko, Jakub Rzepiński

Institution

Military University of Technology

Patent no.

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Description EN

A collection of ICT analytical services dedicated to crisis management support in the field of counteracting threats from mass destruction warfare. The System for Support of Analysis of Threats and Alerting (WAZkA) is an Internet application for crisis management centres of the National System for Detection of Conflicts and Alerting (KSWSiA) and supports: exchange of information between the involved units, coordination of its operation and preparation for decision-making bodies of evaluations and expert analyses concerning emergency situations during natural disasters, technical failures or other events resulting in biological, chemical or radioactive contamination. Analytical modules are the key components of the WAZkA system: Event Tree Analyzer, Contamination Sensor Emulation Environment, Notification and Communication Module as well as Common Operational Picture Module. Analytical services are dedicated applications including the work of analysts involved in risk assessment,

assessment of the current situation and development of threats to factors of mass destruction (CBRN), influencing the optimization of response time of services, in particular the protection of society and critical infrastructure of the country. Services consume data that can be obtained from various sources in accordance with the accepted standards of their representation. Such a structure enables the use of the system at the level of EU crisis management and thus support for cross-border crisis management activities.

PL.14.**Title**

Autonomous Air Defense Combat System ASBOP – PERKUN

Authors

Adam AFTYKA, Adam ANDRZEJUK, Rafał CZUPRYNIAK, Łukasz DUDEK, Sławomir KAPELKO, Piotr KOCIEL, Sebastian PAWŁOWSKI ŁUKASIEWICZ Research Network – Industrial

Institution

Research Institute for Automation and Measurements PIAP, Implementation and Development Centre - Telesystem-Mesko Ltd.

Patent no.**Description EN**

Autonomous Air Defense Combat System PERKUN (ASBOP — Autonomiczny System Bojowy Obrony Powietrznej) has been designed and built by the Research Network Łukasiewicz – Industrial Research Insitute for Automation PIAP, and Research and Development Center Telesystem-Mesko Sp. z o.o. ASBOP PERKUN is a combination of high tactical mobility with instant reaction to emerging airborne threats, such as: cruise missile, UAVs, helicopters, combat aircraft, other. The main weapon of the system consists of MANPAD GROM/PIORUN missiles. The robot features its own means of target detection, such as thermovision sight and daylight sight, it is also designed to cooperate with IFF systems (Identification Friend or Foe). It will prove perfect as a part of a protection system for critical infrastructure, such as airports, oil refineries, maritime ports, and in non-standard applications, e.g. actions by surprise. Targets can be defined by external command system, radio locating device that cooperates with the

system, infrared alerting device. Targets can also be detected with own optoelectronic devices. What is more important, the system operator stays at a safe place, distant from combat stations, and is able to coordinate actions of few combat robots. Operation When direction of incoming threat is defined, the system takes over and tracks the target (videotracker). The target status is then established as Friend or Foe, and the operator can make the decision to use a missile. System characteristics:- Possible fully autonomous operation of the system- Passive mode operation- High mobility, small size- Day and night mode operation- Low thermal signature of the system- Long effective combat operation of the system- The system is very difficult to detect by an enemy

PL.15.**Title**

The hybrid method of rapid reconstruction or manufacturing personalized machines parts, for modern production lines

Authors

Maciej CADER

Institution

ŁUKASIEWICZ Research Network – Industrial Research Institute for Automation and Measurements PIAP

Patent no.**Description EN**

In industry, the most important are rapid response times and certainty as to the effectiveness of the proposed applications and technical solutions. Operating in the field of modern industrial technologies, we have developed a product based on personalized service focused on the use of hybrid techniques - combining modern systems for computational simulations, systems for digitizing objects and Additive Manufacturing methods. The service is designed to maintain production in modern manufacturing factories and enterprises. Its main assumptions are:• reconstruction of worn parts of machine parts,• creating digital warehouses of spare parts available "right away",• production of subassemblies or elements of production lines very precisely adapted to the needs of the indicated application,• optimization of production costs of spare parts, by selection of optimal work parameters.The hybrid method of rapid reconstruction or production

parts is a compromise in the relations of the four main aspects of maintenance in production: cost of manufacturing strength / durability of solutions delivery time / downtime type of cooperation (individual order / short-term cooperation / long-term cooperation).Two of examples of representative products based on the hybrid method and aimed at maintaining production in manufacturing companies are:1. Reconstruction of used parts of components by scanning techniques and 3D printing technology:• MAIN BENEFITS FOR THE CUSTOMER:- independence of the company from the parts producers,- reduction of purchase costs of parts / subassemblies difficult to access.2. Creating digital storage of spare parts that can be produced on demand in any quantity and at any time.• MAIN BENEFITS FOR THE CUSTOMER:- reduction of downtime by up to several weeks,- eliminating the need to store parts.

PL.16.**Title**

SpiderHand: robotic interactive system for arachnophobia therapy

Authors

Julia Dominiak, Mikołaj Woźniak, Adam Lewczuk, Krzysztof Grudzień, Zbigniew Chaniecki, Adam Ryłski, Andrzej Romanowski

Institution

Lodz University of Technology, Institute of Applied Computer Science

Patent no.**Description EN**

SpiderHand is an interactive system supporting the treatment of arachnophobia. The presented solution offers a quasi-direct interaction with a spider (or its replica), modelling the patient's movement onto robotic arm operation. The system consists of two main parts – a synthetic robotic arm that is assembled inside the terrarium and a smart, long glove, responsible for mapping of user's movements. The system enables the patient to interact with a spider in a safe and comfortable manner. Smart glove employs a set of sensors to precisely measure the movements of a hand and a forearm, which are then replicated as the movements of the robot. In this way, the patient has an unique opportunity to get acquainted with spider's reactions and

observe how his/her behavior impacts the creature behaviour while being comfortably separated by the terrarium wall. The touch sensations are simulated using vibrotactile feedback on the glove – when robot touches the creature, it triggers vibration stimuli designed to imitate a hairy surface. The robotic arm has been developed using elastic 3D printing technology, for accurate and natural imitation of real touch and movement. The smart glove maps the movement of the joints on the hand (fingers and wrist) and the elbow joint, offering full support for precise gestures. Therefore, we obtain almost real-like experience of touching the creature while preserving the users mental and physical comfort. Early user studies showed that the invention has significant potential for application in psychology treatments for phobias.

Class

PL.17.

Title

Pedestrian navigation for visually-impaired using vibrotactile feedback on the neck.

Authors

Mikołaj Woźniak, Julia Dominiak, Adam Lewczuk, Krzysztof Grudzień, Zbigniew Chaniecki, Adam Ryłski, Andrzej Romanowski

Institution

Lodz University of Technology, Institute of Applied Computer Science

Patent no.

Description EN

The suggested system of navigation for the blind and visually-impaired people conveys information regarding possible direction of movement through vibrotactile stimulation localised on the neck. The presented invention consists of a vibrotactile collar enabling to code 8 geographic directions (4 basic and 4 compound) as well as simple manoeuvres (stopping, turning) as a sequence of short vibrotactile stimuli on the neck. Wirelessly controlled collar can be connected to popular navigation applications, eg. Google Maps. Thanks to our project, a visually-impaired person could follow directions without involving their sense of hearing, being the key part of their perception. The suggested solution was designed in collaboration with doctors and

physicians so as to focus on the user's comfort and safety. The energy-efficient driven microcontroller receives information on the movement direction and the necessity to perform a manoeuvre. The system passes on the information to the user through short vibratory impulses, executed by at least one vibrotactile motor in dedicated time intervals or at particular moments, when the manoeuvre should be done. The collar is made of a breathable sports fabric and enables the actuators' location adjustment according to the personal preferences. The low weight of the device and its mobility make it very discreet in use.

PL.18.**Title**

SubtleTee: Training Aid and Posture Correction System for Amateur Golfers

Authors

Mikołaj Woźniak, Julia Dominiak, Michał Pieprzowski, Piotr Ładoński, Krzysztof Grudzień, Zbigniew Chaniecki, Dominik Sankowski, Andrzej Romanowski

Institution

Lodz University of Technology, Institute of Applied Computer Science

Patent no.**Description EN**

Our invention is a specially modified driving range mat dedicated to support amateur golf training. The system helps inexperienced golfers to maintain proper posture and body balance, simultaneously monitoring the arm movement. The project is based on the sensory and data processing platform, which allows data reading, information processing and providing feedback. All electronic elements are incorporated into the mat to ensure stability and safety for the users. The role of weight sensors located under the player's feet is to control the body balance and to verify whether the position on impact is correct. The player can choose the type of feedback to be provided with. The first option is colour LED stripes. A correction of the position is suggested by the diodes' intuitive localisation and colour, which leads to achieving the required balance. The second possibility is implementing haptic bands located under the user's knees. The player receives suggestions concerning the proper bodily position through vibration signals provided by small DC motors localised on the

front and back part of the bands. Photosensors situated just in front of the ball and directly under the motion path allow measuring the speed of the swing as well as its possible errors within the impact angle. Then, data is processed and displayed on the LCD. This way, the user can see all the significant information, which will be useful for further training. The last element of the system includes an arm band with a deflection sensor which is used in order to control the position of the elbow, notably crucial for the correctness of the swing.

Class

PL.19.

Title

Intelligent door lock assistant for the elderly

Authors

Maja Malaya, Krzysztof Wiedeński, Natalia Bartłomiejczyk, Paweł Welfle, Piotr Łuczak, Zdzisława Rowińska, Zbigniew Chaniecki

Institution

Lodz University of Technology, Institute of Applied Computer Science

Patent no.

Description EN

Intelligent door lock assistant system aims to aid the elderly in proper securement of own premises against potential burglary or other violations. Locking the door is a routine manual action, therefore easily neglected by our perception. Therefore, it is often observed that the tenant forgets whether he/she had locked the door while leaving, which results in additional concern and nerves or the necessity to return home. The presented solution aims to address this problem in a simple way. Intelligent lock monitors the state of door opening and reacts according to the pre-set rules. If the door are open for too long, the owner will be notified on his/her mobile phone. The mobile app offers live, on-request check of current state of the locks in the house. The novelty of the system lays in its adaptability – the presented system can be installed for any traditional bolt lock, enhancing their functionality. The mobile application was design with focus and in cooperation with the elderly, in order to provide possibly intuitive and functional user interface. Thanks to energy-saving microcontroller-based solutions, the system can operate on battery-supply for many days. The lock state monitoring tool connects to

the home WiFi network, reaching the ability to connect with the server and offer live check of the lock states. The invention is aimed to become a part of a modern house model, “smart home” which is driven by the so-called “Internet of Things”.

PL.20.**Title**

Biodegradable polymeric composites from renewable resources

Authors

Anna Masek, Mirosława Prochoń, Malgorzata Latos-Brozio, Olga Olejnik, Marian Zaborski

Institution

Lodz University of Technology, Faculty of Chemistry, Institute of Polymer and Die Technology

Description EN

Nowadays, in accordance with the requirements of ecology and the principles of sustainable development, efforts are being made to intensify the use of natural substances in polymer technology, which contributes to the degradation potential increase of plastic products. To meet these expectations, the subject of the presented invention is an innovative method of producing a polyolefin composition filled with modified cellulose fibers intended for polymer composites of an increased mechanical strength. This composition is unique because it is characterized by the ability to adjust the lifetime of the finished product in a very simple way - by adding the right amount of natural filler. The advantage of the solution over previously known materials is also the fact that the product is not only characterized by simplicity of manufacture, but also reduced production costs, which is extremely interesting due to the high prices of biodegradable polymers available on the market. In addition, thanks to the selection of an appropriate method of modification of natural fibers, which is presented in the patent, one can observe an increase in the strength of the final product, which is not a common effect. The proposed solution is undoubtedly innovative also due to the fact that the waste material (biomass) may be employed in the production process in order to create the presented invention. Moreover, the high mechanical strength of the product allows a wide range of applications: from the packaging industry to the automotive

PL.21.**Title**

BIO-INSPIRED MATERIALS REINFORCED WITH
NATURAL FIBRES

Authors

Anna Masek, Stefan Cichosz, Karol Tutek, Marian
Zaborski

Institution

Lodz University of Technology, Faculty of Chemistry,
Institute of Polymer and Die Technology

Patent no.

-

Description EN

Nowadays, in accordance with the requirements of ecology and the principles of sustainable development, efforts are being made to intensify the use of natural substances in polymer technology which contributes to the degradation potential increase of plastic products. Therefore, the subject of the presented invention is a process for producing a polyolefin composition filled with modified cellulose fibres for polymer products with increased mechanical strength. The mentioned composition is also characterized by the possibility of adjusting the lifetime of the final product by adding the adequate amount of natural filler and appropriate surface modification of natural fibres. Unlike known solutions, the presented product is characterized by simplicity of manufacture, relatively easy optimization of product lifetime, as well as reduced production costs, which is extremely interesting due to the high prices of biodegradable polymers available on the market. Moreover, the addition of unmodified natural fibres to the polymer matrix most often reduces the mechanical strength of the composite. In the case of the proposed invention, the opposite effect can be observed - cellulose fibres increase the strength of the final product. The proposed method of preparing a polyolefin composition containing modified cellulose fibres is a cheaper alternative to creating an environmentally friendly material while increasing the mechanical strength of the product.

PL.22.**Title**

Method of obtaining unmodified hydrogen sulfide sorbent from bog iron ore

Authors

Andrzej Żarczyński, Kamila Płacheta, Adam Rylski, Marcin Zaborowski, Marek Kaźmierczak, Magdalena Szymczak

Institution

Lodz University of Technology, Institute of General and Ecological Chemistry

Patent no.**Description EN**

For centuries, bog ores have been used as a secondary raw material for iron smelting and a specific building stone for fortifications, palaces and churches. In the last few decades, the usefulness of fine bog ores as hydrogen sulfide (H₂S) sorbent for the purification of biogas and waste gases has been noticed. Currently in Poland and many countries of the world, the importance of turf ores is increasing in biogas purification processes - one of the renewable energy sources (RES). Production of this fuel enables the utilization of waste biomass from agriculture, agri-food industry, municipal bio-waste and sewage sludge. Removal of H₂S from biogas is necessary because during combustion this gas causes corrosion of equipment generating electricity and heat, as well as pollution of the atmosphere with sulfur dioxide. The subject of the invention is a method for obtaining unmodified hydrogen sulfide sorbent from piece bog iron ore, intended to remove this impurity contained in gas mixtures, especially in biogas. The method of obtaining unmodified sorbent from bog iron ore consists in the use of natural bog iron ore containing not less than 15% by weight of iron calculated on the element, which is mechanically crushed immediately after collecting from the soil, then the ore fraction is separated on the sieves with dimensions of 2 - 50 mm, rinsed with water, preferably at a temperature not higher than 38°C. The method according to the invention allows the removal of hydrogen sulfide (H₂S) by means of boggy ores with significantly reduced flow resistance compared to fine bog iron ore.

Class

PL.23.**Title**

Method of obtaining modified hydrogen sulfide sorbent from bog iron ore

Authors

Andrzej Żarczyński, Kamila Placheta, Małgorzata Iwona Szyrkowska, Adam Rylski, Wojciech Wolf, Marek Kaźmierczak, Marcin Zaborowski

Institution

Lodz University of Technology, Institute of General and Ecological Chemistry

Patent no.**Description EN**

In order to ensure the safe operation of technical devices utilizing biogas, it is necessary to remove impurities from it, which are, among others hydrogen sulfide (H₂S), mercaptans, siloxanes, water vapor and carbon dioxide. The quality of biogas is usually determined by the presence of H₂S - a highly toxic compound that hinders the technical use of this fuel and can lead to environmental pollution. Biogas desulphurization uses numerous methods, physical, physicochemical and biological, among which the method of adsorption with a chemical reaction using iron(III) compounds whose source in Poland is quite easily available turf ore is particularly preferred. The method of obtaining modified H₂S sorbent from bog ore involves in the use of bog ore lumps containing not less than 10 wt. iron, calculated per element, which immediately after being collected from the soil is ground mechanically and separated on sieves from pieces of ore smaller than 2 mm and pieces larger than 50 mm. The obtained fraction of pieces is washed with water and then subjected to drying to a moisture content below 25% at a temperature below 50°C. The dried ore is modified with an aqueous solution of sodium or potassium carbonate, or with an aqueous solution of potassium or sodium hydroxide or a suspension of calcium hydroxide or modified with an aqueous zinc oxide suspension and an aqueous solution of potassium or sodium hydroxide. The process of ore modification is carried out in the temperature range 1-50°C and the sorbent prepared in this way is dried at a temperature of up to 50°C.

Poland

Represented by

Czestochowa University of Technology**PL.24.****Title****Comprehensive disinfection with an anti-infective coating.****Authors**

Marcin Nabiałek, Katarzyna Błoch, Jerzy J. Wysłocki

Institution**Department of Physics/Czestochowa University of Technology****Patent no.**

Application PL

Description EN

Nowadays, protection against bacteria, fungi and viruses is very important. It is known that bacteria and fungi multiply on all kinds of surfaces and in hard to reach nooks and crannies. New viruses can survive under favorable conditions for up to several days, which means that they are easily infected. That is why comprehensive disinfection is so important. It is particularly important to subject such disinfection to all types of public transport, special vehicles (ambulances, police cars, fire trucks, military vehicles, etc.), hospital rooms, school rooms, flats, production halls and offices. Ozone treatment is the first stage of anti-infective purification. After ozonation, anti-infective nanocrystalline coatings are applied by fogging. The proposed preparations provide anti-infective coatings that last for several months. This means that the area subjected to the above procedure will combat any infectious threat for a longer time than traditional decontamination with alcohol-based agents. It is important that the preparation contains nanoparticles with dimensions ranging from fractions of nanometers to several nanometers and shaped like flakes. This dimension and shape ensures unprecedented performance. Commonly used nanosilver are ball, tube or rod-shaped particles whose contact surface is a point and a line. In addition, these particles are large and do not provide as effective action as proposed in this solution. Nanodrobin colloid should be non-ionic, which further improves its effectiveness.

This procedure has been checked for effectiveness and safety for humans. I believe that during the epidemic it is necessary to use it especially in facilities exposed to direct contact with the virus as well as commonly used buildings or communication vehicles. The creation of a long-lasting anti-infective coating is most purposeful and increases human safety.

Class**4, 12**

PL.25.**Title****Filters improving protection against microorganisms and preventing infections.****Authors**

Marcin Nabiałek, Katarzyna Błoch

Institution

Department of Physics/Czestochowa University of Technology

Patent no.Patent application No. **P.433324****Description EN**

The subject of the invention is an active anti-infective filter, a shield for the human respiratory system. The filter is a barrier protecting against viral, bacterial and fungal infections. The air sucked in by man passes through a filter consisting of a textile cover. The textile cover is made of polyester produced by polycondensation of terephthalic acid with hot formed ethylene glycol. Such material is devoid of lint effect and is biocompatible. The middle layer is a HEPA filter with silver particles. The second outer layer is identical to the first one and is a textile cover. After passing through the filter, disinfected and safe human air enters the respiratory tract. The optimal number of layers is three. Increasing them causes difficulty in breathing.

The filter can be used with masks as a supplement or separately. The respiratory cover can be attached with e.g. scarf, etc. In the age of the Coronavirus, innovative solutions that increase our security are very much needed. The filter can be used by the public and special services in difficult conditions, e.g. hospitals. The nanoparticles used in the filter are unique and should not be treated as commonly used ion crystals with nanometric dimensions. The conducted microbiological tests have shown that the silver particles used very effectively fight hospital bacteria and fungi that are difficult to eliminate.

Class

4,12

PL.26.

Title Bulk nanocrystalline iron alloy.
Authors Marcin Nabialek, Katarzyna Bloch, Bartłomiej Jeż
Institution Department of Physics/Czestochowa University of Technology
Patent no. Patent application No. **P.432728**

Description EN

The subject of the invention is a massive nanocrystalline iron alloy classified as magnetically soft, which can be used in electronics, electrical engineering and energy and in particular as: high power transformers for switched mode power supply systems, high accuracy current transformers for energy meters or impulse transformers for communication.

The massive fast-cooled nanocrystalline alloy according to the invention, the main component of which is iron, is characterized in that Si (Si: 0.25 or 0.5 or 0.75 or 1%) was introduced as a structure stabilizer. Increasing the Si content blocks the growth of Fe phase and borides by limiting the diffusion of atoms over further distances.

The massive nanocrystalline alloy was produced in one production step, which means that it was not subjected to additional processing enabling its nanocrystallization.

In the casting process it was cooled at a speed of about 102 K / s, which at this speed causes a significant relaxation of structure and gives the alloy the expected properties. The Fe₆₅Co_{11-x}B₂₀Si_xZr₂Hf₂ alloy material according to the invention contains (atomically) respectively: Fe - 65%; B - 20%; Zr - 2%; Si - from 0.25% - to 1%; Co - from 10% to 10.75%, Hf - 2% when meeting the Co_{11-x}Si_x relationship (where x = 0.25 or 0.5 or 0.75 or 1) with permissible contamination not more than 0.09%.

The advantage of the proposed alloy according to the invention is also that in relation to the produced amorphous materials of thin alloy strips they can be made in one production stage with a thickness of 0.5 mm while maintaining a low coercive field value, high saturation induction and good temperature stability.

Class

6, 14

Russia

RU.1.

Title

Metal removal from nickel-containing effluent using yeast *Saccharomyces cerevisiae*

Authors

Inga Zinikovskaia, Nikita Yushin

Institution

Joint Institute for Nuclear Research, Dubna

Description EN

Yeast *Saccharomyces cerevisiae*, one of the economical biosorbents obtained as a by-product of the fermentation industry, was used to remove metal ions from complex nickel-containing effluent, with initial nickel concentration 143 mg/L. The effect of pH and sorbent dosage on metal removal efficiency was investigated. Maximum removal of Ni, Cu and Sr ions was achieved at pH 6, of Mo, Fe and Cr ions at pH 3 and of Zn at pH 7. Experiment on the effect of dosage of sorbent on metal removal was performed in two stages. On the first stage sorbent in the dosage of 20 to 40 g/L was added to the effluent on the second stage 1.0 g/L or 10 g/L of new biomass were added to supernatant obtained after first stage. According to obtained data the maximum amount of Ni ions (82%) was removed at addition of 30 g/L of sorbent on the first stage and 10 g/L of sorbent on the second stage of effluent treatment.

Class no.

1

Singapore
Represented by
Citizen Innovation

SG.1.**Title****SNIFFER****Authors**

TAN Wei Kok, Joleen Seto

Institution**Citizen Innovation****Patent**

-

Description EN

During early 2019, there has been large scale poison gas exposure in oil refinery port town of Pasir Gudang, Malaysia. Over 4000 were affected by the illegal dumping of chemicals in the river, resulting in release of toxic fumes exposure. More than 940 seek medical treatment for breathing difficulties at its peak and 111 schools was closed for about 2 weeks. All these unfortunate events can be prevented if there was a system in place for early warning detection of toxic gas in place. In SNIFFER, our system utilizes a network of sensors that can monitor a high risk area 24/7. Using 5G or NB-IoT, we can also put the sensors on lamppost of populated areas, giving an accurate reading of the gas safety level. It also ensures that the authorities can trace the direction & source of pollution to take action quickly.

Class no.

2

Sri Lanka

SL.1.
Title
Non-Invasive Screening Tool to Detect Anemia
Authors
Abdul Azees Ajmal
Patent

LK/P/20320

Description EN

Non-Invasive Screening Tool to Detect Anemia – ‘HemoX’. HemoX is a non-invasive device that calculates the hemoglobin concentration to identify the possibilities of having Anemia in patients. Affordable blood checkups where safe and accurate readings can take place without the need to extract blood via a syringe from patients of wider age range. HemoX provides real-time data readings of blood samples in hemoglobin rather than the traditional invasive method. This is the only non-intrusive way to collect samples using cutting edge technology where patients are provided with a pleasant experience. Approval to test the device was obtained from Ministry of Health and Indigenous Medicine and tested the device at 3 hospitals in Sri Lanka.

Sudan

SD.1.

Title

Comprehensive Smart Waste Disposal System (CSWDS)

Authors

ABDALBASIT IBRAHIM ADAM ABDALLA

Institution

www.smartcaretech.org

Patent

Patent application No3916

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

Syria

SY.1.

Title **One Implant kit for All dental implant system**
Authors **Dr Mohamad imad Droubi**
Institution SYRIAN INVENTORS
Patent **Patent No. 5361**
Description EN Dental Implant kit for the practitioner dentist to do implantation without surgery with High success rate and reduced cost. It can be used with all kinds of dental implants without surgical implant motor.
 Class no. **4**

SY.2.

Title Titanium Mesh in implantology
Authors **Dr Mohamad imad Droubi**
Institution SYRIAN INVENTORS
Patent **Patent No. 5700**
Description EN Dental implant to replace posterior teeth of the lower jaw in case of the insufficiency of the bone content above the inferior alveolar nerve for making the implant in it.
 Class no. **4**

Taiwan

Represented by WIIPA

TW.1.

Title

Preparation and use of *Antrodia cinnamomea* mycelia fermentation product for improving nonalcoholic steatohepatitis (NASH)

Authors

Chen Chin-Chu / Ko Wang-Sheng /
Huang Ting-Ting / Lin Ting-Wei / Chen Yen-Po

Institution

Grape King BIO

Patent no.

I620815

Description EN

Antrodia cinnamomea, a unique and endemic medicinal mushroom in Taiwan. The present invention discloses a preparation method of a fermentation product of *A. cinnamomea* mycelium for improving non-alcoholic fatty liver disease.

Class no.

4

TW.2.

Title

The use of *Cordyceps Cicadae* active substances for inhibiting and / or reducing allergic responses

Authors

Chen Chin-Chu / Hsu Jui-Hsia / Li I-Chen /
Chen Yen-Po

Institution

Grape King BIO

Patent no.

I663980

Description EN

In vitro studies have shown the extract of mycelium of *Cordyceps cicadae* inhibits IgE-mediated allergic responses. We utilize patented technology of liquid fermentation to extract *C. cicadae* and develop topical skin products.

Class no.

4

TW.3.

Title

Anti-glare Lampshade

Authors

YANG ,HAO-CHENG / CHANG, YAO-YU/ Anderson
Chung/ HSU, CHIH-YU / KUAN,HSIEN-HSIANG

Institution

Hsinchu County American School

Patent no.

M577479

Description EN

Traditional anti-glare lamps using polarizers are only

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used for desk lamps, with the anti-glare being angle-limited. By contrast, this work uses an innovative polarizer configuration to make the anti-glare effect 360-degrees.

Class no. 4

TW.4.

Title Laser draw line ruler

Authors CHANG, WEN-HSUAN / HUANG, MIN-CHUN / JHAN, CIAO-YING / KUAN, CHUN-I / KUAN, HSIEN-HSIANG

Institution Kuai Ji Junior High School

Patent no. M581269

Description EN Generally the commercially available laser pen can only draw a line. For the marking problem of multiple lines, there is still no way to solve. This work can solve the problem of drawing multiple parallel lines. It can also be adjusted as needed to change size and draw multiple parallel lines.

Class no. 10

TW.5.

Title Magnetic Cannon

Authors JIAN, SHUO-I / CHENG, YU-SHENG / CHENG, I-TE / ZHANG, JI-YOU / LIN, SHAO-HUNG

Institution Kuai Ji Junior High School / Yong-Shun Elementary School / Qing-Xi Elementary School

Patent no. M592335

Description EN According to using the principle of energy conversion, we designed this toy type pinball table with a combination of Gauss rifle shooting method. This work also has many other situational designs. For example, it can also play by double pair or it can change the shooting target, like bowling pins. It is an extremely ingenious, modern parent-child fun toy.

Class no. 12

TW.6.

Title Simulation candles

Authors LIN,TING-WEI / HSU, HO / CHEN,YI-AN / HUANG,YU-CHE / CHANG,YEN-KUN

Institution Kuai Ji Junior High School

Patent no. M590220

Description EN There are a few disadvantages concerning the use of candles, such as burns, pollution, the cause of fire, spread of virus, and candle flame goes out easily. The simulation candles use water to conduct electricity, and the water flows out of the cup to enhance the realism of the candles burning.

Class no. 12

TW.7.

Title Simple cart

Authors HUANG, MIN-CHUN / LIN, WAN-ZHEN/ JHAN, CIAO-YING / HSU, YUEH-MEI / TSAI,TSUNG-LIN

Institution Kuai Ji Junior High School

Patent no. M591056

Description EN The carts on the market are often too huge and bulky to carry. Our product is invented by improving the disadvantages of the traditional carts. It's more convenient to carry and store. It can be also adjusted with the size of the goods.

Class no. 12

TW.8.

Title 3-in-1 Pet Coat

Authors KANG, YU-JUI / KANG, PO-CHUN / WU, MIN-CHE/ KUAN,HSIEN-HSIANG

Institution Kornell Academy

Patent M590355

Description EN This eco-friendly design will enhance the fun when taking care of your lovely pets.
1. STAY DRY : Can be placed on pets when showering so that the owner can remain dry all the time.

2. EASY PEASY : Can be worn in rainy or cold weather to maximize the fun being outdoors regardless of the weather conditions.

3. STAY SAFE THE SMART WAY :

The lighting reflective element provides optimal visibility when walking the pet in dark.

4. HANDY WHEN IT COMES TO POOP: The attached bag makes it handy all the time. Throw the bag and you're ready to go!

Class no. 13

TW.9.

Title Cool Drying Machine

Authors HSU,HSIN-YING / CHUNG,HSING-TSEN

Institution Kornnell Academy

Patent M592702

Description This product is a detachable device. The hangers prop up the clothes to increase ventilation space. The hangers are designed to be hollow inside, Which forms a tube that lets the air from the hair dryer flows to the special-designed holes that were spread evenly on the hanger. When air is blown inside the tube, convection allows hot air to flow from the inside out, resulting the clothes to be dried with high efficiency.

EN Class no. 12

TW.10.

Title Recycle charger

Authors ZHENG, TSAI-CHENG / WU,HSIN-JUNG /

CHANG,CHIN-HSUAN / TAI,JUI-YING

SHIH,YU-CHIEN / LEE,CHENG-CHAN

Institution Kornnell Academy

Patent no. 108216121

Description Nowadays, smartphones are very frequent, and every phone needs to charge when it is out of battery. Our product is using the principle of magnetic sense, turning the handle to generate electricity so that you can charge your phone in a short time. And it is an environmental protection product. You can also use a large solar panel or a dry cell battery to charge your phone.

EN Class no. 10

TW.11.

Title	MAGNETICALLY ATTACHABLE WALL STRUCTURE THEREOF
Authors	YU, WU-ZHOU/ YEH, CHUNG-WEI / HSU, UZU-KUEI /HUANG, MING-CHIH / HSU, CHIA-WEI
Institution	NATIONAL PINGTUNG UNIVERSITY OF SCIENCE AND TECHNOLOGY & AIR FORCE INSTITUTE OF TECHNOLOGY
Patent no.	I654357
	Magnetic objects are able to be attached to the magnetically attachable concrete layer.
Description EN	AFIOT collaborated with Union Steel Development Corporation (Capital 4,000,000USD) firm to develop the product.
Class no.	7

TW.12.

Title	A QUICK-START VAWT WITH WIND COLLECTING AND GUIDING FUNCTION
Authors	HSU, CHIA-WEI / HSU UZU-KUEI / HSUEH, TING-YU /
Institution	CHANG, YUNG-SHENG / YEH, CHUNG-WE
Patent	AIR FORCE INSTITUTE OF TECHNOLOGY
	I684733
Description EN	The general wind turbine subject to " reverse pressure " and " cut speed " issue disturbed, it is not only caused the structure failure of the wind turbine by the high wind speed, but also reduced the wind power transfer by the wind drag. The low efficiency bypass flow is induced by the reverse pressure because the wind flow is not easily through the wind power system, which will reduce the wind energy conversion rate. The present invention is a guide and may have a function of wind-collecting wind turbine design which mainly ameliorate the above problems. Collected by the collector and transmitted to the trailing edge of the fan blade and produces high-pressure tailing jet. For the vertical axis wind turbine, it can accelerate the rotation to increase power output in

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low speed, and produce a stable anti-torque force to fan in high speed. It becomes the all day long operations, not only to overcome the problem of high wind back pressure and cut off wind speed.

Class no. 1

TW.13.

Title 24-Second Training System for Basketball with Whistle Signal Control and Master Control Mode

Authors LU, CHIA-LIANG / HUANG,HUNG-YAO / CHEN, JUI-CHENG / CHU, WEI-CHENG / TESENG, HSIN FU / PO, AN

Institution St. John's University / Hujiang High School

Patent I658852

Description EN By whistle frequency control basketball's 24-second training system, at the same time and the master device can be synchronized with all the control functions, to achieve the master device and wireless remote control device synchronization operation.

Class no. 13

TW.14.

Title AC Control Device for Resistive Load with Power Adjustment by Pulse Width Modulation Method

Authors LU, TAO TING / HUANG, JIAN-JUN / LIN, JI-SHENG / LIN, QI-MIN / PENG, CHIEN-HAO / CHEN, LI-CHIEH

Institution National Taiwan Ocean University / St. John's University/ Hujiang High School

Patent no. M579844

Description EN The control device generates AC DC through a bridge rectifier, and generates a pulse width modulation (PWM) signal by a programmable single chip. The pulse width modulation (PWM) signal controls the solid state via an optocoupler driving circuit. The solid state relay controls the on-voltage area of the full-wave DC output to achieve power control for controlling the resistive load.

Class no. 5

TW.15.

Title Wireless Remote Control Device with Two-Way Confirmation and Display

Authors LU, TAO-CHING / CHANG, HAO-HSIANG / LU, CHAO-WEN / CHAN, CHI-HO / MO, SHUN-CHING / WU, SHU-WEI

Institution LIPS CORPORATION / St. John's University

Patent no. M586492

Description EN The device is composed of a display unit, a main control unit, a controlled unit and a driving unit. The display unit can display and check whether the controlled module is correctly turned on or off, thereby achieving the effect of two-way confirmation and display.

Class no. 10

TW.16.

Title Multifunctional stick

Authors CHANG, CHEN-TZU / TSUNG, HAO-JIH / YANG, WAN-JUNG / LIANG, CHUN-HSIANG / WU, KUAN-TING / CHANG, HUNG-CHUN

Institution ER XIN HIGH SCHOOL

Patent no. M568631

Description EN The only choice to practice filial piety is to make the elderly have a peaceful ending of their life journey. It's a pity that, most of the people are too busy with their job, and don't have spare time to take care of the elderly. While they are working, sometimes unfortunate things happen without enough time to deal with. Based on those perspectives mentioned above, referencing the patent ideas of modern intellectual assistive devices and the application of products nowadays, the product has been invented combining WIFI hotspots, GPS, and cloud drive. The elderly can press the button on the walking stick which can send instant LINE message and indicate their position and further provide family members to handle. With light sensory system, it can save energy by switching the power automatically and be used as warning light and searchlight. The elderly can protect themselves and others without the environmental restrictions with this assistive device.

Class no. 12

TW.17.

Title Multi-function bag\
SHEN,CHIA-YANG / CHANG,KUAN-CHIH /

Authors LIN,CHIH-HSIN / HSIAO,FAN-YU / TSAI,YU-HAN /
TSENG,YI-WEI

Institution ER XIN HIGH SCHOOL

Patent no. M583225

Description EN No doubt, the problem of air pollution has not only been widely spread in Taiwan, but also one of the most concerned issues in the world. Plants and vehicles around the world emit carbon dioxide in abundance, becoming one of the culprits of air pollution. Air pollution is mainly composed of fine particles (PM). Many studies have confirmed that these particles can cause damage to our respiratory system and cardiovascular system, leading to asthma, lung cancer, and dry eye syndrome (DES), etc. Moreover, the learning effects of children and their memory span will be affected, and our work is to fight against polluted air.

Class no. 12

TW.18.

Title Pencil box with sterilization function
LIN,HSING-YU / CHIU,SHIH-YU / CHAN,CHIEN-HUA / YEH,YU-JUI / WU,HAO-KAI / CHEN,YU-CHENG

Authors

Institution ER XIN HIGH SCHOOL

Patent no. M64407

Description EN Nowadays, people have their meals outside, increasing the usage of disposable tableware. Some people consider that using disposable tableware might be more sanitary and safer so as to avoid getting the infection through contacting with the saliva of a sick person. With the awakened sense of environmental protection, more and more people start to think over how to cut down the expense of natural resources.
We use ultraviolet to disinfect the disposable tableware. Then, we can always keep them clean, which benefit our health. We installed a lighting gear to be in reserve.

Class no. 12

TW.19.

Title Study of Mini Self-Driving Car Deep Image Analysis
Based on Architecture of AIoT

Authors Chung-Yen Hsiao / Wen-Tsai Sung

Institution National Chin-Yi University of Technology

Patent no. -

Description EN This research is based on the thinking of Edge Computing architecture in AIoT. Raspberry Pi 4B is used for lane analysis. Jetson Nano uses deep convolutional neural network for object detection. Then the two single-board computer analysis results are transferred to Motoduino U1 through GPIO for data integration and load drive. The load drives are: DC Motor and Servo Motor. The integrated data is wirelessly transmitted to the router using NodeMCU, and then the router transmits it to the terminal smart device through 4G to complete the task of monitoring autonomous driving.

Class no. 10

TW.20.

Title An analysis method and system for the internal accessibility of complex roads based on the middle line of roads

Authors WEI JIN ZHAN / YUE GUO-SEN / CHIEN WEI / WANG LI-JIANG / LIANG JING-ZU

Institution Beibu Gulf University

Patent no. ZL 2018 1 0297842.6

Description EN The invention sums up the traditional space problem to the space thinking solution field, and realizes the fast solution of the problem. Its biggest characteristic is that the complexity of the problem is linearly proportional to the number of nodes, which reduces the multidimensional complexity of the space problem to one dimension.

Class no. 8

TW.21.

Title PET ACCESSORY WITH MODULAR BUILDING BLOCK AND INTELLIGENT POWER DEVICE

Authors FA-SHIAN CHANG / I CHANG HSU / JYH-HAW CHEN / SU SHANG CHI / YA JIN LU

Institution CHENG SHIU UNIVERSITY AND CHUNG SHAN INDUSTRIAL & COMMERCIAL SCHOOL

Patent no. M591405

Description EN The present invention is a modular building block having a remote control, the force following the pet aids, can be applied to various inconveniences size pet action, assist out, walking rehabilitation and many other features, reducing the burden of the owner. The present invention has a universal, relevant, easy to replace, highly scalable, reasonable price, with recycling properties and parts commonality, high integration, use of a wide range of advantages for the pet care market at home and abroad, with a deep business value.

Class no. 4

TW.22.

Title AUTOMATIC SENSING AND FIRE EXTINGUISHING DEVICE

Authors FA-SHIAN CHANG / SHU-SHIUAN CHANG / JYH-HAW CHEN / SU SHANG CHI / YA JIN LU

Institution CHENG SHIU UNIVERSITY AND LI-CHIH VALUABLE SCHOOL

Patent no. 108206482

Description EN A smart motion sensing fire-extinguishing platform that can be combined with various types of wall-mounted fire extinguishers of the existing specifications, uses an array flame optical detection module to determine the flame position, and immediately responds to the sensor-connected fire extinguisher spray start switch, aiming at the fire source point for precise fire extinguishing, which has The battery can function when the power is off, and the power line communication and the wireless remote control coexist in communication.

Class no. 12

TW.23.

Title Whistle Traffic baton

Authors CHEN, HSI / SUNG, YU-HSUAN / CHOU,YEN-CHENG / SU,SHAO-EN / CHEN,RUI-HANG

Institution Keelung Municipal Nuan-Shi Elementary School

Patent no.

Description EN Now traffic baton with whistle is not available on the market. People who direct the traffic need to work at rush hour in traffic, and they breathe in emissions when blowing a whistle. We combine a traffic baton and whistle with the Whistle Traffic Baton. Just press a button on the baton to activate a whistle sound.

Class no. 10

TW.24.

Title Touchless Sterilization Trash Can

Authors PAN, CHEN-FANG / CHEN,YU-AN / HSIAO, CHU-JIU / LEE, GUAN-LUN / CHEN,RUI-HANG

Institution Keelung Municipal Nuan-Shi Elementary School

Patent no.

Description EN Trash cans are necessary but also unhygienic object. We use arduino to modify the manual trash can into an automatic trash can which is touchless. Touchless Sterilization can stop the contagion and reduce the germs on it by UV disinfection.

Class no. 10

TW.25.

Title COUNTERWEIGHT MASSAGE STICK

Authors CHANG HUI LIN, LIN WEN CHIEH, CHUANG SHIH CHING, HSUEH NAI YUAN

Institution KAO YUAN UNIVERSITY

Patent no. M575705

Description EN Our design is a counterweight massager, including a manual massager and a counterweight block. The weight block can be mounted on one end of the massager. The weight of the block is 1 ~ 3 times the weight of the massager. In this way, we can increase the strength of the massager by increasing the weight of the massager, just like helping the user to exert strength, thus helping the user to save energy.

Class no. 4

Thailand

By ATIP

TH.1.

Title

Thai herbal extract-loaded microspheres for prolong release in pain treatment

Authors

Ruttiros Khonkarn

Institution

**Faculty of Pharmacy, Chiang Mai University
Chiang Mai, Thailand**

Patent no.

-

Description EN

In eastern countries, traditional medicines are virtually mainstream practice to treat symptoms including pains. The researches show that many herbs have interesting properties related to pain relief such as analgesic, chondroprotective and anti-inflammatory activities. Besides, combining herbs have synergistic effect that can effectively cure pain equivalent to conventional medicine.

However, conventional topical formulations such as cream, gel and ointment, limit the effective topical therapy. These conventional dosage forms cannot sufficiently penetrate to the target site and do not offer prolong duration of action. Thus, the development of more effective formulation is necessary.

Our research introduces western techniques in the form of nanotechnology to effectively entrap and control the release of the herbal active ingredients to the desired area. This will create a mechanism that allow the active ingredients to active site at full efficiency. Herbs are effective but less side effect in comparison with conventional medicines. Moreover, increasing use of herbal products will create an alternative way to promote income for local farmers, also exporting will increase revenue into the country.

Class no.

4

TH.2.**Title**

Self-emulsifying drug delivery system (SEDDS) for enhanced oral delivery of curcuminoids

Authors

Ruttiros Khonkarn

Institution

**Faculty of Pharmacy, Chiang Mai University
Chiang Mai, Thailand**

Patent no.

-

Description EN

Curcuminoids are yellow polyphenolic compounds obtained from turmeric (*Curcuma longa*) rhizome. Curcuminoids have emerged as powerful nutraceutical with many pharmacological activities including antioxidant, anti-inflammatory, antimicrobial, antitumor, and antiangiogenic activities. The use of curcuminoids is limited because of their low aqueous solubility and poor absorption from the gastrointestinal tract resulting in low bioavailability.

The objective of this study was to improve aqueous solubility and bioavailability of curcuminoids by Self-Emulsifying Drug Delivery Systems (SEDDs). SEDDs are lipid based nano drug delivery systems which are isotropic mixture of oils, surfactants and co-solvents/surfactants.

The results showed that the formulation of SEDDs of curcuminoids which composes of curcuminoids, capryol 90, cremophor RH40 and transcutool is stable. It can effectively improve aqueous solubility of curcuminoids around 40,000 times with small droplet size. These properties of SEDDs allow to improve permeation and bioavailability of the formulated curcuminoids across the gastrointestinal membrane.

Class no.

4

TH.3.**Title**

Electrostatic Eliminate and Generator by Electric Field Intensity Energy

Authors

Siseerot Ketkaew

Institution

Ramkhamhaeng University

Patent no.

-

Description EN

This innovative research project presents the design and construction of static electricity production and disposal machines with energy, electric field intensity by using the corona discharge technique and changing the electric field intensity which relies on the principle of a small converter circuit. And using the IC number TL494 as the pulse signal generator by adjusting the electric field intensity at 5 kV/cm 10 kV/cm and 15 kV/cm and adjusting the switching frequency at 10 kHz, 20 kHz and 30 kHz respectively, using high frequency pulse transformers as ground separators and signal amplification to drive the power MOSFET number IRFP460 to work to control the operation of high frequency flyback transformers TLF14511 numbers can be given as high voltage as 1 kV, 2 kV and 3 kV using load as an electric field cell for producing electric charge.

Class no.

4

Turkey

TR.1.

Title

**NOISE AND CYCLIC REDUNDANCY CHECK
AIDED LIST DECODING OF ERROR
CORRECTING CODES**

Authors

ORHAN GAZİ, AHMET ÇAĞRI ARLI

Institution

Çankaya University

Patent

PCT2019/TR050787

Description EN

The invention relates to Noise and Cyclic Redundancy Check aided List Decoding of Error Correcting Codes that uses forward error correction to enhance bit error rate at the receiver side of any communication system. new approach for the error correction decoding has been described in the following. Noise and Cyclic Redundancy Check aided List Decoding of Error Correcting Codes is presented in this document. This invention proposed a new approach to error correction decoding with the aid of artificially generated noise intensity and CRC check through the concept of list decoding. Novel approach of the invention is based on using virtually generated noise as an aid to correct errors for further bit error rate performance gain. The most significant advantage of using decoding procedure of the invention is boosting bit error rate (BER) performance. The invention is suitable to be used for all decoding schemes to increase biterror- rate and frame-error-rate performances with a margin of complexity or latency increment. Presented scheme is its generalized structure can be applied to all existing coding schemes from firstly discovered Hamming codes to recently discovered polar codes. The invention combines coding schemes with artificially generated noise from the perspective of list decoding. In the invention proposed system there is no processing before adding noise into factor graph nodes. Moreover, artificial noise is added to all factor graph nodes in the invention.

Class no.

10

Ukraine

UA.1.

Title

The methodology of gazebos design in Chinese style with catalog of traditional forms and proportions (for modern landscape projecting)

Authors

Chang Peng, Yulia Ivashko

Institution

Kyiv National University of Construction and Architecture, Kyiv, Ukraine

Description EN

Today, Chinese-style gazebos and pavilions are especially popular in landscape gardening. In order to make the gazebo look harmonious, for every climatic conditions and landscapes, special forms of Chinese elements and proportions have been developed for centuries.

The presented methodology for designing gazebos in the Chinese style is based on a catalog of characteristic forms and proportions compiled by the authors on the basis of historical examples that can be reproduced taking into account compatible materials and building technologies for different climate conditions.

UA.2.

Title

A model of the functional organization of an art-cluster based on a revitalized industrial enterprise

Authors

Ivashko Oleksandr, Mykola Dyomin

Institution

Kyiv National University of Construction and Architecture

Description EN

Today, more and more often, the term “art-cluster” is applied to revitalized industrial facilities. The absence of clear criteria for the art-cluster as a new type of public formation leads to the fact that objects, which are essentially a simple collection of random tenants, begin to mean a common term. It should be understood that the art-cluster, by its nature, given the semantic content of the terms “art” and “cluster”, is not an architectural object, but a way of organizing space for an art function based on intraspecific relationships.

Art formation can be represented in the form of a hierarchical model, where the primary entity is an art object, on the basis of which art-centers and art-clusters can be formed. The peculiarity of an art-object is that such object or several objects are separated and exist independently, and if located under one roof, they are easily replaceable.

An art-centre is made up of several art objects united by a common infrastructure. An art-cluster is a higher level of art formation where art-objects are interconnected and aimed at achieving a common result. Based on the combination of several art schemes, it is possible to create a mega-cluster with a combination of several simple clusters and additional art-objects related to the common infrastructure in its structure.

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



Vietnam

By Dr. Phan Quoc Nguyen, Vietnam National University, Hanoi

VN.1.

Title

Tandem extraction of anticancer and antidiabetic cinammate drugs from *Kaempferia galanga*

Authors

Nguyen Anh Duc, Nguyen Dang Vu

Institution

M.V Lomonosov Middle & High School
Foreign Trade University

Description EN

Tandem extraction strategy was developed to efficiently extract anticancer and antidiabetic cinammate drugs ethyl *p*-methoxy-*trans*-cinnamate and *p*-methoxy-*trans*-cinnamic acid from the rhizomes of the common Vietnamese medicinal plant *Kaempferia galanga* L. The strategy is based on different polarity of the isolates and involves two extraction steps in which the first step extracts and purifies ethyl *p*-methoxy-*trans*-cinnamate and the subsequent step enriches *trans*-*p*-methoxycinnamic acid. Ethyl *p*-methoxy-*trans*-cinnamate is a liver cancer-chemopreventive drug and induces cells into an apoptotic pathway, resulting in the inhibition of human liver Hep-G2 cells. Meanwhile *p*-methoxy-*trans*-cinnamic acid is an antidiabetic drug and strongly inhibits carbohydrate-hydrolyzing α -glucosidase. The tandem production of the drugs in their pure forms and high yields as well as the extraction and purification of ethyl *p*-methoxy-*trans*-cinnamate in a single step have not been reported.

VN.2.

Title

Extraction procedure of *Panax bipinnatifidus* to produce saponin-enriched extract for treatment of stomach ulcers and the obtained product from this procedure

Authors

Ha Hai Duong

Institution

HUS High School for Gifted Students

Nowadays, natural and alternative/complementary medicines become important trend in pharmaceutical sciences for prevention and treatment of various diseases. It is also noticeable that more than 70% of drug molecules are origin from nature.

Gastroenterology impairments, especially stomach ulcer, remain serious threats in human life and more than 10% of population in the World suffer from certain type of gastric lesion and the situation becomes more serious in recent years.

Description EN

Panax bipinnatifidus Seem., known as one among eleven *Panax*/ginseng species and be distributed in the Northern West of Vietnam, is a hygrophilous and shade-enduring plant, preferring cool and wet climate conditions. The root of *P. bipinnatifidus* has been used in local ethnomedicine to increase physical performance, to improve thinking and memory, reduce cancer risks, and lower blood sugar in diabetes. There are very few publications regarding its chemical constituents, especially no report on its benefits for management of the stomach ulcer yet.

The present study on bioactive constituents of the title ginseng against gastric ulcer led to the identification of the saponin extract and the main saponin content, araloside A, for the first time showing significant anti-ulcer effects. The chemical structure of araloside A was elucidated on the basis of spectroscopic data and the anti-ulcer activity was evaluated *in vivo* by ethanol-induced gastric lesion in rats.

The anti-ulcer effects of the saponin extract and the main saponin araloside A suggested that the ginseng *Panax bipinnatifidus* and its constituents are promising for development of natural medicine and molecular drug for the gastric ulcer management.

VN.3.**Title****Automatic Spray device for hand disinfection****Authors**

Trần, Duy Phúc, Đỗ, Ngọc Trâm Anh

Institution

Hanoi Academy International Bilingual School

Foreign Language Specialized School

Description EN

Washing hands by using disinfectant solutions is an important part of prevention of diseases not only during the time of Covid-19 epidemic, but also in hospitals, in customer service areas. Therefore, this invention focuses on the description of a automatic hand-spraying device. When the user places his/her hand under the sensor, the device senses the human hand, the signal is then transmitted to the micro controller unit (MCU) and the MCU will send control signal to pump to pumping solution out in the form of mist. Amount of solutions pumping out is from 3 to 5ml each time as requirement of WHO.

Our development uses E18-D50NK sensor from ODOM manufacturer, this sensor can detect infrared signal caused by motion. When sensor notices the infrared energy that reflected from human hands, object detector is triggered and the sensor turns on an open collector circuit at its signal output pin. The detecting range can be adjusted by a potentiometers soldered on its circuit board, from 3 to 50 centimeter and response speed is faster 0.3s.



NATIONAL EXHIBITORS

Universities

Research Institutes

Companies

Individuals

University POLITEHNICA of Bucharest

RO.1.

Title EN	Nanospun Collagen Rabbit Glue and Antimicrobial Agents Compositions and Method of Obtaining Them
Authors	M. Râpă, C. Gaidău, E. Matei, M.D. Berechet, M. Pantilimon, A.M. Predescu, C. Predescu
Institution	University POLITEHNICA of Bucharest, RO
Patent no.	RO00525/2020(A0)
Description EN	The invention relates to a composition of antimicrobial nanofibres and a process for obtaining it used for making non-active medical dressings for wounds treating. The process, according to the invention, consists in the electrospinning of the mixture of rabbit skin glue in the form of granules, water, acetic acid solution and antimicrobial agents with activity against <i>Escherichia coli</i> , <i>Staphylococcus aureus</i> and <i>Candida albicans</i> .
Class no.	4

RO.2.

Title EN	Orthopedic device for correction of the TALIPES CALCANEUS / TALIPES CALCANEVALGUS DEFECT
Authors	Costoiu Mihnea Cosmin, Semenescu Augustin, Doicin Vasile Cristian, Ulmeanu Mihaela Elena, Cîrstoiu Cătălin, Doicin Ioana Cristina, Mateş Ileana Mariana
Institution	University POLITEHNICA of Bucharest, RO, EU
Patent no.	RO 133750 / 2019-12-30
Description EN	The invention relates to an orthopedic device for the correction of a malposition of the foot expressed by the defects talipes calcaneus and talipes calcaneovalgus, particular variants of Talus valgus, and to the process for obtaining it. The orthopedic device for Talipes calcaneus / Talipes calcaneovalgus defect correction, is composed of a fixed subassembly, which is fixed to the leg of the foot, a movable subassembly, which is attached to the foot of the defective foot, a snail-snail gear and a graduated cap, which is fixed with the help of screws with clogged head.
Class no.	4- Medicine - Health Care - Cosmetics

RO.3.

Title EN	Method and system for anonymously collecting position and mobility information in public passenger transport, based on Bluetooth and Artificial Intelligence
Authors	Minea Marius, Dumitrescu Cătălin, Chiva Ionuț-Cosmin, Minea Viviana - Laetitia, Semenescu Augustin
Institution	University POLITEHNICA of Bucharest, RO, EU
Patent no.	RO A00493/ 2019-08-17
Description EN	The invention relates to a method and system for the anonymous collection of position and mobility information in public passenger transport, based on Bluetooth and Artificial Intelligence, for improving public transport management systems by supplementing the information required by them, providing a simple method of collecting. anonymously (without the possibility of associating the persons with the detected devices) the data on the flows of passengers transported or waiting in the passenger stations, information regarding the position of the public transport vehicles on the route, as well as the density of the private traffic of vehicles on the the route of the means of public transport.
Class no.	8.- Aviation, car industry and transportation

RO.4.

Title EN	Biocompatible Medical Device and Method of Making Same
Authors	Ruxandra Vidu, Augustin Semenescu, Ileana Mariana Mates, Cristian Dragos Vidu
Institution	University DAVIS, CA, USA and University POLITEHNICA of Bucharest, RO, EU
Patent no.	US Patent Application 38170047/2019
Description EN	The invention describes a biocompatible medical device that include two supported meshes for providing mechanical strength and osseointegration properties of implant, and a multilayer porous material in between them loaded with antibacterial compound to promote controlled release of pharmaceutical agents at the site of surgical intervention. The composition gradient in the multilayer porous material is attained by loading successive layers of porous material with different amounts of bioactive materials and then stacking them to create a gradient of composition across the porous material. The present invention describes method(s) to place and fasten the medical device to the bone structure.
Class no.	4. Medicine - Health Care - Cosmetics

RO.5.

Title EN	MULTIFUNCTIONAL MEDICAL DEVICE FOR THE TREATMENT OF ANORECTAL PATHOLOGY
Authors	Suciu Alexandru, Semenescu Augustin, Ficai Anton, Suciu Ioan Alexandru
Institution	University POLITEHNICA of Bucharest & ALEXDOR Medical, RO, EU
Patent no.	RO A00725/2019
Description EN	The invention relates to a multifunctional medical device, reusable, which allows the effective treatment, in safe conditions of the anorectal pathology, with the prevention of its evolution to advanced stages. The medical device is designed as a multi-component assembly with easy use both in medical clinics and by patients for the purpose of increased compliance. The use of the invention allows a complex therapeutic action, by mechanical effect of compression, by the optional application of the therapeutic cold and by the exact dosage and the application in the intra- and perianal area of a suitable pharmaceutical preparation formulated for the topical therapy of anorectal pathology
Class no.	4. Medicine - Health Care - Cosmetics

RO.6.

Title EN	SEMISOLID FORMULATION FOR COMBINATION TOPICAL THERAPY OF COMMON, BENIGN ANORECTAL DISORDERS
Authors	Suciu Alexandru, Semenescu Augustin, Ficai Anton, Suciu Ioan Alexandru
Institution	University POLITEHNICA of Bucharest & ALEXDOR Medical, RO, EU
Patent no.	RO A00726/2019
Description EN	Our novel, semisolid formulation is an effective and affordable combination topical therapy for the common, benign anorectal disorders. This flexible approach to formulation affords customized treatments that can be tailored to a patient's specific clinical findings. At the same time, our formulation yields complex therapeutic solutions that effectively address the overlapping nature of benign anorectal disease preventing its progression towards advanced-stage pathology
Class no.	4. Medicine - Health Care - Cosmetics

RO.7.**Title EN**

Compositions and process for treating paper, parchment or other writing media, for removing pathogens such as fungi, mold or bacteria

Authors

OPREA Ovidiu Cristian; FICAI Anton; FICAI Denisa; MOTELICA Ludmila; ANDRONESCU Ecaterina; TRUȘCA Roxana Doina

Institution

University POLITEHNICA of Bucharest, RO, EU

Patent no.

Patent application A00798_27.11.2019

**Description
EN**

The present invention relates to the production of innovative compositions consisting of ZnO nanoparticles loaded with natural extracts, for the treatment of cellulosic (manual or industrial paper) or protein (parchment) support of documents affected by pathogens (fungi, molds or bacteria). One of the current problems faced by libraries, archives, but also private collectors or occasional customers of antique shops, is the degradation of books or documents, especially those stored in less stringent conditions. Normally the temperature should not fall below 21oC, the humidity should not exceed 50% and the storage place should benefit from good air ventilation. Most of the time, private collectors, but also smaller libraries or institutions, do not have the necessary financial strength to hire a professional restorer and / or to purchase the necessary equipment, which is extremely expensive. Also, this problem of mold and specific odor can be faced by anyone when buying a book from an antique shop or borrowing it. Moreover, in the case of schools that reuse books in several successive years, an advanced sterilization of books can be ensured, either in a regime organized by the educational units or by the direct beneficiaries (parents of the students). If the removal of visible inflorescences is relatively easy, there is always the problem of the subsequent appearance of molds as the spores remain trapped in the cellulosic, fibrillar texture, which acts as a net. The powder formed of ZnO nanoparticles loaded with natural extracts such as essential oils performs a deep cleaning of the cellulosic or protein support (nanoparticles can penetrate the thickness of the sheet of paper, parchment, etc.). It also ensures an increased resistance of the support to subsequent attacks, as some of the nanoparticles will remain in the structure of the sheet of paper or parchment.

RO.8.

Compositions and process for treating the materials devoted for the *manufacturing protective devices with antiviral and antimicrobial activity*

Title EN**Authors**

Anton FICAI, Denisa FICAI, Ludmila MOTELICA, Ovidiu-Cristian OPREA, Ecaterina ANDRONESCU

Institution

University POLITEHNICA of Bucharest, RO, EU

Patent no.

Patent application (transmis prin posta)

**Description
EN**

The present invention presents the technology for modifying protective devices (masks, overalls, gowns, gloves, visors) by applying a polymeric layer loaded with Ag nanoparticles (of various shapes and sizes from spherical nanoparticles to triangular, triangular chamfered, hexagonal nanoparticles, cubic, cylindrical, etc.), Cu, ZnO, etc. stabilized with suitable agents and loaded with antiviral / antimicrobial substances based on pure agents (eugenol, eugenyl acetate, ...), or complex oils or extracts with low volatility to ensure long-lasting action and, in the case of masks protection, in particular, to avoid inhalation of high amounts of volatile components with irritating / inflammatory effects. In the formulations to be applied on the protection devices, the content of nanoparticles can reach 1-2%; the antiviral / antimicrobial components also 1-2% while the polymer content varies in the range of 0.1-100% the difference being solvent. The technology can also be applied on the raw material which is used in the manufacturing of protective devices, following the thermoforming to be performed with the raw material that already contains the antiviral / antimicrobial components and through this process their embedding in the material takes place.

Class no.

12

University of Agronomic Science and Veterinary Medicine Bucharest

RO.9.

Title EN	An In Vitro Study of the Influence of <i>Curcuma longa</i> Extracts on the Microbiota Modulation Process, In Patients with Hypertension*
Authors	Emanuel Vamanu ¹ , Florentina Gatea ² , Ionela Sârbu ³ , Diana Pelinescu ³
Institution	1 Faculty of Biotechnology, University of Agronomic Science and Veterinary Medicine, Bucharest, Romania 2 Centre of Bioanalysis, National Institute for Biological Sciences, Bucharest, Romania; 3 Department of Genetics, ICUB-Research Institute of the University of Bucharest, Bucharest, Romania
Patent no.	-
Description EN	<p>The multiple causes of cardiovascular diseases signify a major incidence and developmental risk of this pathology. One of the processes accountable for this pathologic development is the instauration of dysbiosis and its connection with an inflammatory process. Low antioxidant colonic protection encourages the progression of inflammation, with cardiovascular dysfunctions being a secondary consequence of the dysbiosis. Curcumin is one of the bioactive compounds displaying promising results for the reduction of an inflammatory process. The present study aims at demonstrating the capacity of three extracts drawn from <i>Curcuma (C.) longa</i> through an in vitro simulation process, for microbiota modulation in patients with hypertension. The acidic pH in the extraction process determined a high curcumin content in the extracts. The major phenolic compound identified was curcumin III, $622 \pm 6.88 \mu\text{g/mL}$ for the ethanol/water/acetic acid extract. Low EC₅₀ values were associated ($0.2 \mu\text{g/mL}$ for DPPH scavenging activity) with the presence of curcumin isomers. A metabolic pattern became evident because the relationship between the short-chain fatty acids acted as a clinical biomarker. The curcumin present stimulated the formation of butyric and propionic acids. Microbiota activity control included a high degree of curcumin degradation and biotransformation in the other phenolic compounds. This developmental process was supported by the progression in the enterobacteria with a corresponding escalation in the pH level. The metabolomic pattern demonstrated a performance similar to the administration of dietary fibre, with the positive effects being dose-dependent.</p> <p>*- Research published in <i>Pharmaceutics</i> 2019, 11, 191, under Creative Commons Attribution License</p>

RO.10.	
Title EN	Ecological process for obtaining animal feed from a mixture of indigenous aromatic and medicinal plants waste resulting from aqueous, alcoholic and hydroalcoholic extractions
Authors	Alina Ortan, Narcisa Babeanu, Sorin Avramescu, Simona Spinu, Cristina Dinu-Pirvu, Milen Georgiev
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent no.	A0025/22.01.2020
Description EN	<p>The present invention relates to the ecological process of obtaining animal feed from a mixture of aromatic and medicinal plant waste (<i>Origanum vulgare</i> L., <i>Apium Graveolens</i> L. 1753, <i>Momordica Charantia</i> L., <i>Salvia officinalis</i> L.) obtained after alcoholic, hydroalcoholic or aqueous extraction. The proposed method does not involve the use of chemical synthesis raw materials, does not have a negative effect on the environment and human health, is inexpensive and reduces the amount of waste of native medicinal and aromatic plants obtained from different types of extraction with potential for pollution.</p> <p>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.</p>
Class no.	3
RO.11.	
Title EN	Fibrous material support from oily plants with antioxidant properties, enriched with biologically active compounds obtained from aromatic and medicinal plants waste after extraction and method of obtaining it
Authors	Alina Ortan, Narcisa Babeanu, Sorin Marius Avramescu, Simona Spinu, Manuel Drugulescu, Milen Georgiev
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent	A0026/22.01.2020
Description EN	This invention refers to a fibrous support material from oil plants (<i>Silybum Marianum</i> L., <i>Helianthus Annuus</i> L., <i>Linum</i>

usitatissimum L., *Carthamus tinctorius* (Mohler, Roth, Schmidt & Boudreaux, 1967), enriched with biologically active compounds obtained from waste extracts of *Origanum vulgare* L. from aqueous extractions, from different industries or research activities, in order to increase its antioxidant activity and the method of obtaining it. The proposed solution uses cheap materials that result as residues from different industries (food, pharmaceutical, etc.), does not require toxic and/or dangerous substances and solvents, and has no negative action on the environment and human health.

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.

3

RO.12.**Title EN**

Standardized extracts of *Melissa officinalis* L. - method for obtaining and potential therapeutic use

Authors

Alina Ortan, Narcisa Babeanu, Sorin Avramescu, Simona Spinu, Lia Mara Ditu, Milen Georgiev

Institution

University of Agronomic Sciences and Veterinary Medicine of Bucharest

Patent

A0027/22.01.2020

**Description
EN**

The present invention relates to a vegetable extract obtained from a species of the genus *Melissa*, with concomitant antioxidant and antimicrobial properties. The plant extracts are obtained through a process with good extraction efficiency of the active principles, the product obtained is ecological and natural, it presents simultaneously two types of therapeutic action: antioxidant and antimicrobial, it has potential applications in natural treatments for topical use, which does not involve the use synthesis substances against which high resistance has developed over time.

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.

Technical University of Cluj-Napoca, România

RO.13.	
Title EN	Capacitor DC-link arrangement
Authors	Teodosescu Petre Dorel, Vintiloiu Ioana, Pop Adrian Cornel, Rusu, Tiberiu, Pop-Piglesan, Florin-Adelin, Daramus, Mihai-Alexandru
Institution	Technical University of Cluj-Napoca
Patent no.	Patent EPO: EP3300462-B1/11.12.2019
Description EN	The present invention provides a capacitor DC-link arrangement, in particular for high current ripple applications. The capacitor DC-link arrangement comprises a substrate such as a PCB-based substrate, a first terminal and a second terminal which are both arranged on the substrate, a plurality of ceramic capacitor elements, wherein: each of the ceramic capacitor elements is connected as well to the first terminal and the second terminal, the plurality of ceramic capacitor elements are connected in parallel, and the ceramic capacitor elements are arranged and connected in a similar current path and in particular in the same resistance current path.
Class no.	2

RO.14.	
Title EN	Electronic device for led lighting systems
Authors	Teodosescu Petre Dorel, Sabău Madalina Sabina, Szekely Norbert Csaba, Bojan Mircea, Marschalko Richard
Institution	Technical University of Cluj-Napoca
Patent no.	Patent OSIM: RO131169-B1/28.06.2019
Description EN	The invention relates to an electronic device for controlling light emitting diodes - LED used in lighting systems. According to the invention, the device comprising a single electric energy conversion stage, without rectifier circuit on the input side, consists of an input filter, an alternating current converter, which consists of a capacitive divider and a half-bridge electronic circuit comprising two bidirectional electronic devices, enabling the direct connection to an alternating voltage source and the generation, at the output, of high frequency alternating voltage signals, which supply a resonance circuit LC, a LED load and a control circuit generating control signals for the converter.
Class no.	2

RO.15.	
Title EN	Method and equipment for the electrostatic separation of nonconductive granular material mixture
Authors	Adrian Samuila, Mihai Bilici, Alexandru Iuga, Lucian Dascalescu, Laur Calin
Institution	Technical University of Cluj-Napoca
Patent no.	Patent OSIM: RO128979-B1/30.07.2019
Description EN	In order to separate in electrostatic field granular mixtures of non-conducting materials, we use a common tribocharging and separation chamber. The components of the granular mixture get electric charge of opposite sign in fluidized bed and are deflected in opposite directions due to the electrostatic field obtained by two high voltage electrodes of circular type. The charged granules are removed from the separation chamber by two insulating cylinders rotating in opposite directions and are collected as separated fractions.
Class no.	1
RO.16.	
Title EN	Orientation module with modular structure and multiple bends
Authors	Vaida Călin, Plitea Nicolae, Pîslă Doina, Gherman Bogdan, Suciu Marius
Institution	Technical University of Cluj-Napoca
Patent no.	Patent OSIM: RO129923-B1/30.08.2019
Description EN	The patent refers to an orientation module with modular structure and multiple bends useful for surgical instruments. The solution offers multiple possible configurations which can be customized based on the specific needs of a certain procedure. The solution intends to increase the workspace of the instruments providing a solution for the avoidance of areas or elements which block the direct access towards the surgical field. This solution can be integrated also in the structure of instruments which allow the orientation of the active tool. Consisting of only four different components, and a very simple construction, the patent can be implemented for any type of instrument dimensions.
Class no.	4

RO.17.**Title EN****Intensifier system for high pressures****Authors**

Cornel Ciupan, Emilia Ciupan, Rares Petruș

Institution**Technical University of Cluj-Napoca****Patent no.**

Patent OSIM: RO131458-B1/30.10.2019

**Description
EN**

The invention relates to an intensifier system for high pressures, which can be used in the manufacturing of water jet cutting machines or in other industrial applications requiring high pressures. According to the invention, the system consists of the following components:

- a sonic generator comprising a shaft with a cam which moves a rod that pushes on a membrane fixed with some screws between a lower casing and an upper casing that generates pressure waves in a liquid (oil) found in the pipe connected to the sonic amplifier;
- a sonic amplifier made of a chamber having the membrane (D-oil) coupled, by a rod to another membrane (d-water), where the pressure waves generate a reciprocating motion of the two membranes, the pressure amplifying ratio being given by the square of the ratio between the diameters (D/d).

Class no.

5

RO.18.**Title EN****Device for noise conversion in electric energy****Authors**

Filip Nicolae

Institution**Technical University of Cluj-Napoca****Patent no.**

Patent OSIM: RO128582-B1/29.11.2019

**Description
EN**

The device for converting noise into electricity, according to the invention, is composed of a panel containing several electromagnetic and piezoelectric transducers, each transducer being provided with a convergence guide, conical in shape, which has the role of transforming the spherical waves captured in flat waves, having the effect of increasing the power of the mechanical vibrations that are discharged on the transducers and producing electrical signals that are collected by a multichannel system with rectifier circuits with double alternation to an accumulator or to a consumer, the broad spectrum of absorption and conversion of the noise obtaining -se is differentiated by the conical elements and the translators used in a painting.

When recovering noise and obtaining electricity, the

following sequence of phenomena is detailed: the conversion of the acoustic signal into mechanical vibration and the conversion of mechanical vibration into electrical signal.

Class no.

2

RO.19.

Title EN

Portable device for the rehabilitation of the upper limbs

Authors

Giuseppe Carbone, Elio Matteo Curcio, Diego Mazzei, Doina Pîslă

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application UIBM Italy: 102020000003563

**Description
EN**

This patent proposes an electrically powered portable device, for the rehabilitation of the upper limbs with reduced dimensions and weights. The proposed system allows to perform automated and/or semi-automated mono-dimensional, bi-dimensional or three-dimensional assisted exercises. The device is characterized by a lightweight structure, equipped with a simple kinematic mechanism, aimed at assisting the work done by the physiotherapist during the rehabilitation phases in the clinics and/or at patients' homes. The device has a movable base, which can be placed on any flat surface and, accordingly, the device can be easily portable and re-positioned on any table or desk of daily use. The proposed device is equipped with a specific sensorized interface that allows to identify the user's intentions of movement in the Cartesian directions as well as to monitor and record the rehabilitation session for an assisted execution of the exercises. The device can be equipped with a video interface, which can be used for an autonomous or semi-autonomous interaction by the user, for example, through the implementation of interactive gaming tasks with manipulative targets of increasing difficulty. In addition, it can be equipped with a remote control and telemonitoring interface by an operator, in order to have historical clinical data of the patients, to carry out clinical assessments of the rehabilitation progress and for tuning and tailoring the rehabilitation plan.

Class no.

4

RO.20.	
Title EN	Innovative paralel robot for lower limb rehabilitation
Authors	Pîslă Doina, Gherman Bogdan, Nadas Iului, Pop Nicoleta, Crăciun Florin, Tucan Paul, Vaida Călin, Carbone Giuseppe
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A00391/27.06.2019
Description EN	RECOVER is a parallel robotic system designed for the post stroke rehabilitation of the lower limb for bedridden patients. The robotic system consists of two parallel robotic modules which are connected to each other to achieve the rehabilitation of the main joints of the lower limb. The first rehabilitation robotic module (the hip/knee module) is based on a 2 DOF planar mechanism and it is designed for hip and knee flexion and extension. The second rehabilitation robotic module (the ankle module) is based on a 2 DOF spatial mechanism which guides a mobile platform together with the patients' foot in spherical motion achieving the ankle flexion/extension and inversion/eversion motions.
Class no.	4

RO.21.	
Title EN	Parallel robot for the recovery of lower limb mobility
Authors	Pîslă Doina, Birlescu Iosif, Vaida Călin, Gherman Bogdan, Tucan Paul, Carbone Giuseppe, Plitea Nicolae
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A00752/15.11.2019
Description EN	RAISE is a parallel robotic system with which you can recover the mobility of the 3 main joints of the lower limb (hip, knee and ankle), by moving them, each segment of the lower limb being supported and moved in a controlled manner. RAISE presents a modular structure, having two modules, namely: a module designed to recover the flexion / extension and abduction / adduction of the hip and flexion / extension of the knee; the second module is attached to the first and is intended for the recovery of the dorsiflexion / flexion and inversion / eversion movements of the ankle.
Class no.	4

RO.22.	
Title EN	Automated medical instrument for inserting multiple needles on linear and parallel trajectories in interstitial brachytherapy cancer treatment
Authors	Gherman Bogdan, Bîrlescu Iosif, Burz Alin, Pîslă Doina
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A00806/28.11.2019
Description EN	<p>The present innovation is a medical robotic instrument designed to insert percutaneously multiple needles on a straight trajectory in brachytherapy procedures for liver cancer treatment. The instrument has 3 degrees of freedom, having a serial kinematic chain of type PPP and a specially designed gripper. It uses Gantry architecture to position the brachytherapy needle in the XOY plane. The brachytherapy procedure usually requires the precise placement of up to 6 brachytherapy straight needles inside the tumor in a matrix form, at a distance of 10mm from each other (both on OX and OY axes). The needles are taken from the needles rack, which is attached to the robotic instrument, one by one using the needle gripper. The first needle is placed in the middle of the tumor, followed by the others, using the pre-planned trajectories.</p>
Class no.	4
RO.23.	
Title EN	Thermal management passive device for a battery that equips an electric vehicle
Authors	Mariașiu Florin Emil, Varga Bogdan Ovidiu
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A/00448/2019
Description EN	<p>The problem of achieving a proper thermal management of a battery that equips an electric vehicle, is given by the process of thermal demand (heating) of the electrochemical cells that form the battery, during the operation of the electric propulsion group of the electric vehicle. Battery thermal stress is directly related to the required electric power required by the powertrain to achieve dynamic parameters (speed, acceleration, torque to the wheels, etc.) required by operating conditions. The invention relates to a passive device for performing the thermal management of a battery that equips an electric vehicle, by automatically maintaining the temperature (within predetermined limits) inside the housing of a battery that equips an electric vehicle.</p>
Class no.	8

RO.24.**Title EN**

Passive device for ventilation of a battery equipping an electric vehicle

Authors

Mariașiu Florin Emil, Varga Bogdan Ovidiu

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: A/00449/2019

**Description
EN**

The functional performance of a battery equipped with an electric or hybrid vehicle is directly influenced by the ambient temperature in which they operate. At present, it is considered that for the functioning of a battery built on Lithium-ion technology (the most used at present) under optimal conditions, the temperature range of the internal environment in which the electrochemical cells are located must be between -15 oC and +60oC. The invention relates to a passive ventilation device of a battery that equips an electric vehicle, by automatically maintaining the temperature (within predetermined limits) inside the battery housing of an electric vehicle.

Class no.

8

RO.25.**Title EN**

Thermal management active device for a battery that equips an electric vehicle

Authors

Varga Bogdan Ovidiu, Mariașiu Florin Emil, Buidin Thomas

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: A/00703/2019

**Description
EN**

The problem solved by the invention by the active control device of the thermal management of a battery that equips an electric vehicle is maintaining a preset temperature (desired by the manufacturer depending on the dynamic performance of the electric vehicle) inside the battery housing, by natural ventilation with air at the ambient temperature of the electrochemical cells, by controlling some ventilation holes adjustable as air flow allowed. The active control device for the thermal management of a battery that is equipped with an electric vehicle is characterized by the fact that the principle of active operation is based on the sequential opening of some ventilation holes that allow the elimination of the heat inside the housing of a battery that equips an electric vehicle, in depending on the thermal charge of the battery.

Class no.

8

RO.26.	
Title EN	Decontamination Process by washing of heavy metal polluted soils using potassium salts of humic acids and chitosan as washing agents
Authors	Dr. ing. Damian Gianina Elena, Prof. dr. ing. Micle Valer
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A 00557/2019
Description EN	<p>The process uses a suitable mixing and shredding installation where the contaminated soil together with the washing solution containing potassium salts of humic acids and chitosan is introduced into the attrition chamber, inclined at 1° with respect to the horizontal plane. The stirring of the mixture in the attrition chamber is performed with 12 mixing blades arranged on a rotating shaft and inclined at 3° with respect to the rotating shaft. The rotating shaft is driven by an electric motor. This decontamination process by washing of heavy metal polluted soils ensures a high contact of the soil particles with the washing solution, which leads to high efficiency. It also eliminates the need for soil sorting on small particle size prior to decontamination and is also an ecological process due to the nature of the washing agents used.</p>
Class no.	1

RO.27.	
Title EN	Ex-situ bioremediation process of hydrocarbon polluted soils using <i>pseudomonas</i> and <i>bacillus</i> microorganisms
Authors	Prof. dr. ing. Micle Valer, S.L.dr. ing. Sur Ioana Monica, ing. Mitrea Mihai
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A 00683/2017
Description EN	<p>The process consists of treating the soil, after sorting and homogenization, by mixing with nutrients and microorganisms belonging to the genera <i>Pseudomonas</i> and <i>Bacillus</i> and then disposed in the form of a pile on an impermeable surface, at the base of the pile being a drainage layer of gravel that favors the aeration process. By ensuring the aerobic treatment conditions through an aeration system consisting of the blower and the air distribution network, at the temperature of 24–26°C, pH 7.5–8, maintaining the humidity of 28–30%, and an increase in the total number of germs (colony-forming units-CFU) from 151x105 to 213x107 CFU/gram of soil, after 12 weeks of treatment the depollution efficiency reached is 83%. It is a process of reducing the impact on the environment, it has low costs and it is suitable for treating large quantities of soil.</p>
Class no.	1

RO.28.**Title EN**

Rotary-linear motor for the integrated propulsion and assisted steering drive of electrical vehicles

Authors

Szabó Loránd, Ruba Mircea

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: A/00446/24.09.2019

**Description
EN**

The invention relates to the use of a single rotary-linear switched reluctance motor for integrated driving of both the propulsion and assisted steering of electrical vehicles. The motor shaft can perform both a rotary motion, which can rotate the vehicle wheel at a variable speed, and a linear one, which can actuate the electric steering system of the vehicle. The application of the invention offers the advantages of simplification by reducing the number of electric motors required to drive the propulsion and steering system of electric vehicles with the direct and independent driving of the wheels, by reducing the volume and mass required for these two drive systems.

Class no.

8

RO.29.**Title EN**

Active cell balancing system synchronized with the charging process

Authors

NEMEȘ Raul Octavian; RUBA Mircea

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: A/00390/12.08.2019

**Description
EN**

The patent refers to an active cell balancing system synchronized with the charging process, without losses, flexible and capable to charge a specific cell or a group of cells. The connections from the supplying source to each cell is realized through relays. Using these connections each cell can be charged separately. The balancing process is realized during the charging procedure by measuring the voltage of each cell in the pack.

Class no.

2

RO.30.	
Title EN	Circuit and method for balance of phases in a three-phase power supply system
Authors	Prof. dr.ing Ovidiu-Aurel Pop, Conf. dr.ing. Alin Grama, Conf.dr Mihai Gabor, Asist. drd.ing Elena-Mirela Ștețco, Alexandru-George Berciu
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A/00124/03.06.2019
Description EN	The invention relates to an automatic system capable of balancing the power consumption for the three-phases power network. The system consists of current sensors for each phase, a digital control unit, modules for switching consumers between phases, keyboard for the user interface, electronic display and optical warning indicators. The proposed invention achieves a redistribution of consumers during their operation by measuring the electric current from each phase. A switch unit is operated so that consumers are redistributed in a balanced way across the three phases, thus optimizing energy consumption and avoiding disturbances in the electricity supply network. The switches are designed in such a way that the switching time does not affect the entire operation.
Class no.	2
RO.31.	
Title EN	Method of electrodeposition of zinc-nickel alloy on stainless steel substrate
Authors	Vermeșan Horațiu, Chira Mihail
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM: A/00673/23.10.2019
Description EN	The invention relates to a method of zinc-nickel alloy electrodeposition on the stainless steel parts through several stages. Electrodeposition of zinc-nickel alloy on stainless steel is important in applications where stainless steel is in contact with a less noble metal. Electrodeposition of zinc-nickel alloy on stainless steel is used especially in the automotive industry. The method of electrodeposition of the zinc-nickel alloy on a stainless steel substrate according to the invention consists of: chemical degreasing (only if the parts are dirty, oily); washing in water; surface preparation in alkaline solution; washing in water and electrolytic zinc in alkaline Zn-Ni solution.
Class no.	8

RO.32.**Title EN**

Sandwich panel based on hemp shives and fibers, and the modality of obtaining it, applicable in the building sector

Authors

Iștoan Raluca, Tâmaș-Gavrea Daniela-Roxana, Manea Daniela Lucia, Vasile Ovidiu

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: a 2019 00237 din 15.04.2019

**Description
EN**

The invention relates to a sandwich panel based on hemp shives and fibers, and the method to obtain it, which has the applicability in the construction sector. The sandwich panel is designed with three layers: a core and two sheets. The low-density core is obtained from hemp fibers and a cement binder, while the thin skin-layers which cover the core on each side are prepared from hemp shives and hydrated lime-cement binder. The panel is used as a partition element with significant acoustic and thermal properties while is responding to several sustainability requirements. The panel was analyzed in four ways: (a) without perforations, (b) with perforations of 1 cm diameter and 10% degree of perforation, (c) with perforations of 1 cm diameter and 20% degree of perforation (d) with perforations of 1 cm diameter and 30% degree of perforation.

The physical characteristics of the sandwich panel are:

(a) without perforations: sound absorption coefficient $\alpha_{\max} = 0.56$ at 350 Hz, thermal conductivity $\lambda = 0.068$ [W/mK], density $\rho = 413$ [kg/m³].

(b) with perforations: sound absorption coefficient $\alpha > 0.80$ on the range frequencies between 650 - 1080 Hz, with $\alpha_{\max} = 0.97$ (810 - 860 Hz)

(c) with perforations: sound absorption coefficient $\alpha > 0.80$ on the range frequencies between 970 - 1350 Hz, with $\alpha_{\max} = 0.85$ (1090 - 1200 Hz)

(d) with perforations: sound absorption coefficient $\alpha > 0.80$ on the range frequencies between 880 - 1740 Hz, with $\alpha_{\max} = 0.95$ (1140 - 1250 Hz)

Class no.

7

RO.33.**Title EN**

Composite plates of natural fibers and process used for obtaining it

Authors

Florea Iacob, Manea Daniela Lucia

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: A/00084/18.02.2020

The invention relates to obtaining composite plates made from natural fibers of sheep's wool intended for the thermal insulation of building constructions that meet the defining regulations for a thermal insulation material, and the process for obtaining them.

Composite boards are made from a mixture of sheep wool fibers, mixed with glue (adhesive) and various binders (clay, Portland cement, plaster, hydrated lime, hydraulic lime NHL 3.5, lime, washable lime, starch, bone glue, and rosin).

**Description
EN**

By removing the disadvantages of the wool-based insulation products, which come in different forms (mattresses or rollers), the innovative character of this invention consists in ensuring dimensional stability of the insulating material.

The process of obtaining the plates consists in wool fiber loosening, wool dosing, hydrating it by spraying water into wool mass in an equal amount to wool mass, dosing the adhesive and binder, water, spraying the mixture into wool mass, pouring the mixture in-mold, the compression of the composite plate for 24 hours, its stripping and the compression interval of 48-72 h.

Class no.

7

RO.34.**Title EN**

Eco- innovative concrete based on cement and recycled waste glass and PET (polyethylene terephthalate) for applications in construction "BESTIPET"

Authors

Ofelia-Cornelia Corbu, Henriette Szilagyi, Gabriel Pirgariu

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM: RO133833

**Description
EN**

The invention relates to the obtaining of a new eco-innovative, sustainable concrete, based on cement and recycled waste in the form of artificial glass aggregate and PET flakes (Polyethylene Terephthalate), as raw material, which successfully replace the non-renewable natural aggregates (waste involving high storage and storage costs).

The eco-innovative concrete was made within the research-development-innovation project - "CHECKS OF INNOVATION" 266 CI / 2018 in order to develop the SMEs, where the beneficiary company, NEW NCR RECICLARE S.R.L. becomes the final recycler. The beneficiary of the research having the main activity object: collection, recovery of the waste and concrete products manufacturing, obtained the Technical Approval no. 001SC-02/635-2019 for alveolar concrete blocks for the purpose of commercialization.

Class no.

7

RO.35.**Title EN**

Method of optimizing an experimental design for polymer concrete using Voronoi diagrams

Authors

Mihai Ciupan

Institution**Technical University of Cluj-Napoca****Patent no.**

Patent application OSIM: A10003/25.01.2020

**Description
EN**

The patent application regards a method of optimizing a two-factor experimental design focused on determining the properties of polymer concrete (mineral casting) in order to find the optimum material formulation for a given application. The invention solves the problem of maximizing the information regarding one of the properties of the material (the dependent variable) using only a limited number of tests defined by the independent variables (p; q). Variable p is the percentage of resin from the total formulation mass and q is Funk and Dinger's equation coefficient.

The method consists of the following steps: choosing the independent variables and their rectangularly shaped value domain, choosing 4 points (C1, C2, C3, C4) in the corners of the rectangle, choosing the remaining n-4 points (C5 to Cn), in a random way on the surface of the rectangle, calculating the Voronoi diagram for the points and then moving points C5 to Cn inside the rectangle until the corner surfaces are all equal to one another ($S1=S2=S3=S4$) and the inner surfaces are all equal to one another ($S5=S6=...=Sn$).

Class no.

7

RO.36.	
Title EN	Soil stabilization with plastic waste materials (PET)
Authors	Ana-Maria Trîmbițaș (Urian), Nicoleta Maria Ilieș, Andor Csongor Nagy, Ovidiu Nemeș
Institution	Technical University of Cluj-Napoca
Patent no.	Patent pending
	Nowadays, the researchers are trying to find innovative solutions for the reuse of different types of wastes generated by living or by different industries. Wastes like tire shreds, glass fibers, polypropylene, polyester, polyethylene are mixed with soil in order to obtain an increase on the shear parameters.
Description EN	The aim of this research is to observe the variation of the shear parameters for clay mixed with polyethylene terephthalate waste. To investigate the effects of polyethylene waste on the strength of the soil, a series of test have been performed on the mixture. The initial experimental results show that there is a significant improvement on the shear parameters. This increase is depending on the amount of waste plastic added to the clay.
Class no.	7

RO.37.	
Title EN	Innovative use of sheep wool for obtaining new materials with sound-absorbing properties
Authors	Simona Ioana Borlea (Mureșan), Ancuța-Elena Tiuc, Ovidiu Nemeș
Institution	Technical University of Cluj-Napoca
Patent no.	Patent pending
	The aim of this study is to obtain new materials with sound absorbing properties using the sheep's wool as raw material. Seven new materials were obtained by hot pressing ($60 \div 80$ °C and $0.05 \div 6$ MPa) of wool fibers and one by cold pressing. Results shown that by the simply hot pressing of the wool, a new product is obtained which can be processed and easily manipulated. The obtained materials have very good sound absorption properties with acoustic absorption coefficient values over 0.7 for the frequency range $800 \div 3150$ Hz; the results prove that the sheep wool has a comparable sound absorption performance to that of mineral wool or recycled polyurethane foam. Hot pressed materials have a much higher density than cold pressed materials. The density of materials made from hot pressed sheep's wool increases with increasing pressure.
Class no.	7

RO.38.	
Title EN	Special and compatible mortars used in repairing microfisures, fisures and cracks in the case of heritage buildings
Authors	Drd. arh. Veronica Ioana Luca, CS II. dr. Ing. Ofelia Corbu, Prof. dr.Ing. Ildiko Bucur
Institution	Technical University of Cluj-Napoca
Patent no.	<p>Patent pending</p> <p>Some of the main criteria for restoring heritage buildings are related to the appearance, composition and durability of the material used for repairs.</p> <p>The Rimetea Village, Alba county, is one of the known village from Romania because it is the only one with prize from Europa Nostra. This distinction can be seen even today on the houses from the center of the village. Rimetea was resurrected by the renovation of the 19th century houses made of stone masonry. Due to humidity, improper interventions with cement mortar, an uneven load or a structural element degradation, the masonry suffers and as a consequence microfisures, fisures and cracks appear; now we need a diagnose from specialists and the involvement of the owners. The laboratory experiment where we mixed ground Podeni calcar stone, probably with pozzolanic qualities[2][3], with different types of cement[4] or hydraulic lime goal is to make compatible mortars suitable for the natural material masonry and increasing the resistance of the heritage buildings. After first mix design we will make more tests taking in consideration also the way this material will be used on the construction site. Also we will use fibers of polipropilena or natural materials for a better resistance for other mixtures.</p>
Description EN	
Class no.	7

RO.39.	
Title EN	Exploratory study on steel bar dissipating device
Authors	Alin Mihali ¹ , Pedro Basto ² , Corneliu Cismaşiu ³ , Válder José da Guia Lúcio ³ and Cosmin Gruia Chiorean ¹
Institution	¹ Technical University of Cluj-Napoca, Romania ² CCPI, Military Academy (Portuguese Army), Lisbon, Portugal ³ CERIS and NOVA School of Science and Technology, Lisbon, Portugal

Patent no.	Patent pending
Description EN	This research proposes, in the context of blast mitigation in structures, the use of an energy-dissipating mechanism. To assure the structural resilience, the large deformations needed to dissipate the massive energy will be driven towards this non-structural energy-dissipating bars disposed behind panels and fixed to the main structure. When subjected to a blast load the panels will deform and transfer the blast pressure through the energy-dissipating bars to the structure. These bars limit the peak loads transferred to the main structure. After an event, the panels and energy-dissipating bars can be replaced quickly allowing the building to regain its functionality in a short period of time.
Class no.	7

RO.40.	
Title EN	The influence of blast furnace slag on abrasion resistance for road concrete
Authors	Nicula Liliana Maria , Corbu Ofelia, Iliescu Mihai
Institution	Technical University of Cluj-Napoca, Faculty of Civil Engineering.
Patent no.	-
Description EN	In this study, the blast furnace slag was used as a mineral addition in the projected road concrete mixtures, and the blast furnace slag in the form of aggregate at 0/4 mm size was used as a percentage of 20%, 40% and 60%. Three concrete slag mixtures were compared with two other concrete mixtures made with conventional materials. Compared to the first conventional mixture, milled slag used as a 15% addition and compared to the second conventional mixture milled slag was used as a substitute for 13% of Portland cement mass. The wear / abrasion resistance was evaluated at the concrete age of 100 days, respectively 150 days. The results indicated the highest wear resistance for the mixture with 20% aggregates crushed from furnace slag, and the mixture with 60% substitution aggregates from furnace slag was observed the lowest resistance. The tendency of evolution of the wear resistance is similar to that of the compressive strength. Mixtures with the highest compression strength also recorded the lowest volume loss after the abrasion test (Böhme). Compared to the first mixture made

with conventional materials, the wear resistance obtained in blast furnace slag mixtures is lower. However, mixtures with 13% ground slag and up to 40% of aggregates crushed from blast furnace slag have higher wear resistance compared to the second mixture made with conventional materials.

Class no.

7

RO.41.

Title EN

Methods for assessing the frost-thaw resistance of road concrete used in our country and at European level

Authors

Nicula Liliana Maria , Corbu Ofelia, Iliescu Mihai

Institution

Technical University of Cluj-Napoca, Faculty of Civil Engineering.

Patent no.

-

**Description
EN**

The paper addresses three methods of assessing the frost-defrost resistance of road concretes prepared with conventional and artificial materials. The blast furnace slag was used, as an artificial material, in granulated and milled form and in the form of crushed aggregates from the steel industry. The most common method used in our country to determine the frost-thaw resistance is the destructive method by measuring the variation of the compressive strength of the samples subjected to repeated freeze-thaw cycles. The most severe method of testing the frost resistance considered at the European level, is based on the calculation of the amount of exfoliated material in the presence of defrosting agents. Another method used is to determined the values of the dynamic modulus of elasticity after repeated cycles of freeze-thaw. The results obtained were interpreted according to different evaluation criteria and compared with limit values proposed by the standardized methods.

Class no.

7. Buidings and Materials

University of Medicine and Pharmacy, Craiova

RO.42.
Title EN

Femoral component of a modular-adaptive hip stent, using an elastic central rod that encloses several metal spheres and constructive modules

Authors

Tarniță Dănuț-Nicolae, Tarniță Daniela, Ciurea Marius, Rogoveanu Otilia Constantina, Dumitru Nicolae, Popa Dragos Laurențiu, Capitanescu Bogdan, Vaduva Razvan Cristian, Ontica Vladimir

Institution

University of Medicine and Pharmacy Craiova

Patent no.

Patent application No. A00104/2020

The invention consists of a modular hip stent, which allows the adjustable selection and assembly of the component parts before insertion into the medullary canal of the femur, to allow the adjustment of the cervical-diaphyseal anteversion angle as needed, to allow a continuous fixation and partition of the endoprosthesis stent in the medullary canal, to allow a reduction of the tensions and deformations developed in the bone by taking part of them by the elasticity of the central rod and to offer possibilities of resolving the possible fractures of the femur at the tip of the prosthesis.

Advantages :

Description**EN**

is modular and adaptable to any type of femoral diaphysis;
 - does not allow micro movements between the stem and the femoral bone;
 - stability is ensured by continuous compression;
 - it avoids the appearance of degenerative - dystrophic injuries important at the level of the contact surface with the fracture focal point because the metallic spheres have a punctiform contact with the bone and not continuous as in the case of other prostheses;
 - allows original solutions to resolve the femoral fractures at the tip of the femoral component of the stent;
 - allows the extraction of the stem without loss of bone because the contact of the spheres with the bone is minimal.

Class no.

4

„Alexandru Ioan Cuza” University of Iasi

RO.43.
Title EN

Rugidom is a platform that connects producers of organic food with their consumers

Authors

Andrei Ungureanu, Florin Alexandru Luca

Institution

PhD Student, University Alexandru Ioan Cuza Iasi, Doctoral School of Economics and Business Administration
Technical University Gheorghe Asachi Iasi

Following research has the scope of developing a prototype of a mobile application in the agro market field. The primary technology proposed will be blockchain crosslinked with mobile applications functionalities. Organic products have a spectacular growth in demand in Europe and thus in Romania as well. Even if the food market is not dominated by organic food, its social implications are to be considered for further research. The questionnaire design was pre-tested and redesigned through personal interviews using email and platforms during the two months. Chosen samples consisted of young farmers aged 18 to 40 and a large variety of consumers located in the Iasi metropolitan area. The results showed that both Rugidom application model aims to identify the farmers market products with the actual producers geographically and in a time-efficient manner. The scope is solving the ambiguity communication between the bio market and its consumers. The pandemic crisis experienced worldwide with COVID-19 emphasizes such importance, its priority being discussed on a large scale.

Description
EN

The first phase of Rugidom model is increasing public understanding and providing the mechanism and support needed for such technology. The model presented in the prototype has the mission consequently to connect, partner, and increase its benefits to improving the quality of life for Romanian citizens. The higher level of usage of the mobile application is more likely to trigger a favourable evaluation from both farmers and consumers; the interaction between future stakeholders could also be positively amplified.

Class

10

“Gheorghe Asachi” Technical University of Iasi

RO.44.

Title EN	Electrical socket with mechanized pull of the plug
Authors	Seghedin Neculai-Eugen, Chitariu Dragoș-Florin, Bocăneț Ana-Maria, Munteanu Adriana, Luca Alexandra, Cracan Arcadie, Andrusca Liviu, Suditu Gabriel, Dragoi Ina, Vatavu Cristina, Avram Elena
Institution	Gheorghe Asachi Technical University of Iași
Patent No.	Patent application No. 5248/18/06/2019
Description EN	<p>The socket according to the invention is composed of a body in which two diametrically opposed buttons are arranged which act as feathers which move some plungers acting on a plug for extraction thereof, the whole mechanism being withdrawn in the free outlet under the action of springs .</p> <p>The technical problem solved by the invention is to provide a socket for mechanically removing the plug by protecting the connection between the socket and the socket.</p> <p>All the elements of the extraction mechanism are held in tension under the action of springs</p> <p>6</p>

RO.45.

Title EN	Mechanical pull-out electrical plug
Authors	Seghedin Neculai-Eugen, Chitariu Dragoș-Florin, Bocăneț Ana-Maria, Munteanu Adriana, Fodor Dimitrie-Cristian, Rusu Oana, Chicet Daniela, Florea Raluca-Maria, Hudisteanu Sebastian Valeriu, Burlacu Andrei, Diac Maximilian, Parvan Costinela
Institution	Gheorghe Asachi Technical University of Iași
Patent	Patent application No. 5247/18/06/2019
Description EN	<p>The electrical plug according to the invention is formed by a body in which two plungers that move axially under the action of articulated rods which rotate due to levers which are hand actuated, the movement of the plungers is leading to the pull of the plug, the plungers coming into contact with the body of the socket.</p> <p>The technical problem solved by the invention is to provide a plug that can be extracted with one hand in a mechanized manner to protect the connection between the socket and its housing</p>
Class no.	6

RO.46.**Title EN** 4 **Jaws Reconfigurable Gripper****Authors** Păduraru Emilian, Chitariu Dragoș-Florin, Chifan Florin**Institution** Gheorghe Asachi Technical University of Iași**Patent** Patent application No. 5274/25.02.2020

The invention relates to a 4-jaw reconfigurable prehension mechanism (gripper) that serves an industrial robotic arm for complex operations of grasping, manipulating and transferring objects, without having to change the prehension mechanism to perform other tasks.

**Description
EN**

The mechanism consists of two main subassemblies: a subassembly that acts as a prehensor and a subassembly that allows reconfiguration / folding of the jaws thus transforming the four-jaw prehension mechanism, into a two-jaw prehension mechanism, in both constructive forms allowing a parallel linear displacement of jaws.

Class no.

6

RO.47.**Title EN** **Energy efficient equipment for metallic chip fragmentation and compression****Authors** Chitariu Dragoș-Florin, Păduraru Emilian, Chifan Florin**Institution** Gheorghe Asachi Technical University of Iași

Objective of the project:

- designing a family of equipment for fragmentation and compression of metallic chips resulting from the CNC machining of metals in an energy-efficient, modular manner, by applying ecodesign principles according to Ecodesign Directive 2009/125 / EC;

**Description
EN**

- the integration of energy-efficient hydraulic equipments such as mini-booster hydraulic amplifiers, which allow for local pressure increase and reduced energy consumption by reducing the hydraulic power unit's pressure;

- technological optimization of individual parts in the construction of fragmentation equipment, especially the geometry and materials of cutting tools used for waste fragmentation;

- integration of control and control equipment compatible with Industry 4.0;

- manufacture and testing prototypes of fragmentation equipment - waste compaction

RO.48.

Title EN	Formulation of phytocosmetic nanoemulsion for topical therapy of acne vulgaris
Authors	Ana Simona BARNA ¹ , Gabriela CIOBANU ¹ , Oana Teodora CIUPERCĂ ¹ , Constantin LUCA ¹ , Iosif KOSZEGHI ²
Institution	1 “Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection, Iași, România 2 Emergency County Hospital Piatra Neamț, Piatra Neamț, România
Patent	- The objective of the current investigation was to design a nanoemulsion based on phytocompounds like <i>Salix nigra</i> (willow) bark extract and <i>Propolis glycolic</i> extract suitable for topical application in acne vulgaris treatment. The nanoemulsion formulated it is “O/W” emulsion/ waterbased, which have <i>Hamamelis virginiana</i> hydrosol as a continuous phase and a synergistic combination of noncomedogenic oils as a dispersed phase. The phase oil is a combination of wet oils like: <i>Nigella sativa</i> , <i>Azadirachta indica</i> , <i>Cannabis sativa</i> , <i>Avena Sativa</i> and <i>Calophyllum inophyllum</i> . As a surfactant was used a non ethoxylated emulsifier based on vegetable-derived propanediol.
Description EN	We investigated the nanophytocosmeceutical formulation for physicochemical properties (physical appearance, color, texture, homogeneity, phase separation, pH, rheological properties) and antimicrobial activity. 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. Nanoemulsion was found to be stable and exhibited suitable rheological characteristics and have a homogenous texture with no signs of phase separation. Evaluation of the antimicrobial activity of active ingredients <i>Salix nigra</i> (willow) bark extract and <i>Propolis glycolic</i> extract contained in nanoemulsion against <i>Propionibacterium acnes</i> was tested by disc diffusion method. The results from the disc diffusion method showed that the active compounds from nanoemulsion could inhibit the growth of <i>Propionibacterium acnes</i> .
Class no.	4

RO.49.**Title EN**

Green Synthesis of Gold Nanoparticles Using Marined Red Algae Biomass for Technological Applications

Authors

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Institution

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³ Romanian Academy, Filial of Iași, Branch of Geography, 18 Carol I Street, 700506 – Iași, Romania

**Description
EN**

In recent years, nanoparticles have become particularly important for technological applications, but their preparation is often costly and laborious. The research aims to provide a cheap and green preparation of gold nanoparticles using as reducing agent marine red algae biomass. The method is based on the simple mixing of a solution of gold(III) ions with marine red algae biomass (*Callithamnion corymbosum sp.*) in acid media (pH = 2.0), at room temperature (22 ± 1 °C). After 6 hours of contact time, spheric gold nanoparticles are formed and their size is between 20 and 80 nm. The UV-VIS spectrum of the obtained gold nanoparticles showed a broad band in the region 543-547 nm, which corresponds to their surface plasmon resonance. The shape of the UV-VIS spectra does not change even after 15 days, which indicates that the obtained gold nanoparticles are stable at least during this period. FTIR, SEM and EDX methods have been used for the detailed characterization of gold nanoparticles, in order to confirm their size and dispersity. In addition, the kinetic studies allow us to design the mechanism for obtaining gold nanoparticles. Besides the short preparation time, high stability in aqueous solutions and simplicity, this method does not require gold solutions of high purity, wastewater from industrial activities can be also used. All these advantages are in agreement with the principles of green chemistry.

RO.50.

Title EN	Titanium-based alloy
Authors	Vizureanu Petrica ¹ , Madalina Simona Baltatu ¹ , Andrei Victor Sandu ¹ , Bernic Mircea ² , Mihail Balan ²
Institution	¹ "Gh. Asachi" Technical University of Iasi ² Technical University of Moldova
Patent	Pending MD Application The invention relates to the metallurgy of the alloys, namely to a titanium alloy. The titanium alloy, according to the invention, contains molybdenum and silicon. The problem solved by the proposed invention consists in the development of an alloy with high corrosion resistance in SBF solution, with a low elasticity mode, close to that of the human bone, high biocompatibility, ensuring the possibility of manufacturing from this alloy implants for medical applications.
Description EN	
Class no.	6

RO.51.

Title EN	Biocompatible alloy and method of producing the same
Authors	Madalina Simona Baltatu ¹ , Vizureanu Petrica ¹ , Andrei Victor Sandu ¹ , Mohd Mustafa Al Bakri Abdullah ² , Mohd Arif Anuar Mohd Salleh ²
Institution	¹ "Gh. Asachi" Technical University of Iasi ² Centre of Excellence Geopolymer & Green Technology School of Materials Engineering, University Malaysia Perlis
Patent	Pending MY Application A method of producing a biocompatible alloy comprising the steps of blending a composition of substantially impurity-free elements comprising titanium in an amount of 50% and above by weight of the composition, molybdenum in an amount of not more than 30% by weight of the composition, zirconium in an amount of not more than 15% by weight of the composition and tantalum in an amount of not more than 20% by weight of the composition, and subjecting the blend to repeated melting and solidification in an electric arc furnace and in an oxygen-depleted environment for 6-10 cycles to form the alloy.
Description EN	
Class no.	6

RO.52.**Title EN****The Bat-House****Authors**

Neculai Oana, Barbu Marian Bogdan

Institution**Technical University “Gheorghe Asachi” of Iasi****Patent**

in progress

Building space is more and more limited. A solution is placing houses in more unconventional areas, like on water.

The architectural concept called Bat-house (name given by the reflection of the house on water) implies a building situated on water with a ground floor, an eccentrically placed level, and a wild life observation deck under water.

**Description
EN**

The building has a caisson foundation, shaped into four arches, fixed in the bedrock at the bottom of the see or lake. The structure consists in an oval shaped concrete core, and a parabolic roof which is supporting itself on two slim concrete pillars and by using metallic cables, similar to suspended bridges. The metallic cables are inserted in pipes placed in the concrete floor between ground floor and the storey. To create the eccentrically placed level, the cantilever principle is applied.

The innovative system of this building consists in pipes that are placed in the concrete floor and through which metallic cables of 14 cm diameter pass. The idea is to pre-stress the concrete floor, while the metallic cables are subjected to tension. Where the cables go out from the concrete floor, gripping rectangular elements are placed in order to induce the desired stresses.

RO.53.**Title EN****Hyperbolic suspended gardens****Authors**

Neculai Oana, Bodescu Liliana

Institution**Technical University “Gheorghe Asachi” of Iasi****Patent**

in progress

In order to create more space for agriculture purposes, one idea is to look up. The proposed hyperboloid structure is composed of multiple glass panes, interconnected with stainless steel rods or casings which envelope three concrete floors supported by a cylindrical concrete core. The rigid core had a hollow middle, which goes down to the groundwater layer, where a pump brings water to all of the floors, therefore reducing the costs of irrigations. At the top, the glass structure is slanted inwards so that rain and snow to slide into the well, thus collecting it for irrigation purposes. The shape was chosen in order to have a

**Description
EN**

stronger structural integrity. The platforms which compose the elevated floors are suspended as cantilevers fixed on the concrete core, and the concrete wall presents holes placed 90 cm over the level of the platform, where the hoses with the pumped water are placed. Access to the higher floors of the greenhouse is made by either a simple iron stepladder with a pulley system that eases the transport of fertilizers and gardening tools, or a spiral staircase around the concrete core. Another advantage for this system is allowing growing different types of plants, as the soil type, water quantity, humidity and temperature conditions can be modulated for each level and sector.

RO.54.

Title EN

Under the sea opera

Authors

Neculai Oana, Bodescu Liliana

Institution

Technical University “Gheorghe Asachi” of Iasi

Patent

in progress

Description

EN

Being able to admire wild underwater life swim through the sea as you are attending either a conference, a play or a concert, was the main driving idea of this project. As space seems to be a pressing issue, and inspired by salt mines concept, the idea of an underground structure emerged, composed of an arcade beneath the sea floor, emerging through the underwater steep slope as a large dome, a quarter of which being composed of high strength glass. The arcade can host a museum, an art exhibit or even a play area for children, while the dome would hold a large concert hall. On the outside of the glass there are five large spotlights that illuminate the surrounding water. Inside the dome, the floor descends with wide steps in the style of an ancient Greek theater, curving around the sides of the dome. The steps are wide enough to allow either chairs or people can simply sit directly on them. The entrance and exit of the building are through a hydraulic elevator which emerges either in a gift shop or a cafe located at the end of a large platform above the sea, supported by columns that go all the way down to the bedrock layer, into the slab foundation. The roof at the access point is inclined, covered with solar panels to provide electrical energy for the surface structure, while tidal energy generators fuel the underground structure.

**„Grigore T. Popa” University of
Medicine and Pharmacy Iași**

RO.55.

Title EN

Design and Development of Robotic Rehabilitation Device for Medical Therapy

Authors

Corciovă Călin, Fuior Robert, Luca Cătălina, Gheorghiță Andrei

Institution

“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering

**Description
EN**

Rehabilitation is an important key to recovery for patients with neurological related injury and repeated practice of a particular movement appears to be crucial for motor recovery in hemiparesis patients. The use of robotic devices for the rehabilitation has shown promising results for patients to improve their motor functions. The promising fact of robotics therapy is meaningful and motivating for patient which is a key driver towards recovery. The project aims to develop a robotic rehabilitation system of the upper limb to facilitate flexion and extension of the fingers with an aim for faster recovery by motivating through the use of bio-feedback signals together with progress logging facility to store and assess the patient performance. The complete control system comprised of electronic hardware interface and graphical user interface for user interaction and actuating the robotic hand. Electronic hardware interface consists a microcontroller, a flex sensors module and a USB based Data Acquisition (DAQ) device interfaced to a computer.

DAQ device is USB 6009, from National who is configured to send control signal to the microcontroller for activation of the motor based on the mode selection. Signal from each flex sensors is processed to decide the trigger signal level required to activate one of each servomotor for movement each finger to perform therapy. Signals are connected to the DAQ device interfaced to the LabVIEW based GUI developed for control of the entire system. The device could be used for high intensity repetitive task without the presence of therapist which has potential to adopt a home based therapy.

RO.56.**Title EN**

Intelligent device for monitoring the physiological parameters of isolated persons at home

Authors

Fuio Robert, Andrițoi Doru, Luca Cătălina, Corciovă Călin

Institution

“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering

Description EN

Maintaining a high level of health in a population is one of the global challenges for humanity, especially in these days, because the SARS-CoV19 pandemic has forced the rethinking of medical techniques and procedures. In this sense, the care and the remote monitoring of the physiological parameters, for a real diagnosis, requires considerable attention and at present it is in continuous development involving high hardware and software techniques. The aim of this project was to develop an intelligent system for reliable monitoring of patients suspected of COVID 19, allowing healthcare professionals to monitor some of the parameters needed for a firm, remote and isolated diagnosis of the patient. Through the developed system, a series of physiological parameters are measured, such as temperature at two points, oxygen saturation, pulse, dehydration degree of the patient using the specified sensors attached. All of these sensors will transmit data to the Atmega32u4 microcontroller on a Seedeuno Cloud development platform. The purchased data can be stored on an SD card and downloaded later for analysis, but it can also be sent to an analysis center or in a cloud continuously via the Internet using 802.11ac wireless technology on two bands or GSM mode. Following the values received, a daily and hourly report can be made automatically with the patient's evolution during the monitoring days.

RO.57.**Title EN**

Unconventional Method designed to Improve Ergosterol Biosynthesis Process

Authors

Mădălina Poștaru¹, Alexandra Tucaliuc², Dan Cașcaval², Anca-Irina Galaction¹

Institution

¹**“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering**
²**“Gheorghe Asachi” Technical University of Iasi, “Cristofor Simionescu” Faculty of Chemical Engineering**

and Environmental Protection

Ergosterol, known as provitamin D₂, is mainly accumulated in yeast cell membranes (*Saccharomyces* sp., *Candida* sp.), especially in free form in the plasma-membrane. As chemical synthesis of ergosterol does not represent an efficient method for its production, this study aimed to analyze, by considering different levels of mixing intensity, aeration rate, and n-dodecane concentration, the influence of aeration efficiency on ergosterol production by *S. cerevisiae* in batch and fed-batch fermentations.

**Description
EN**

In batch fermentation system, the study indicated that the oxygen mass transfer coefficient is amplified for about 3 times by increasing the volumetric concentration of n-dodecane from 0 to 15%.

In fed-batch fermentation process, the positive influence of hydrocarbon on oxygen transfer rate is amplified mainly at its higher concentration level, as the result of the increased yeasts cells amount. Thus, through the variation of n-dodecane concentration from 0 to 15% vol., the oxygen mass transfer coefficient value increased 4 times for the batch fermentation.

RO.58.**Title EN****COMMUNICATION SYSTEM FOR PEOPLE WITH SPEAKING DISABILITIES****Authors**

Mitocariu Adina-Ecaterina, Atodiresei Irina, Simion Mădălina-Petronela, Robert Fuior

Institution

“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering

**Description
EN**

Hearing plays an important role in the life and mental activity of a person, and is especially appreciated for his contribution to the development of verbal language. The main objective of this device is to raise the social barriers between normal people, and those with hearing and speech impairments. The system architecture is made using a glove by connecting five tensiometric marks, located at the level of each finger of the upper limb, and an LCD as a display system. As a working principle, it is based on the translation of sign language into written words, which can be understood by each person. Once the person with disabilities performs different movements of the hand, representing certain letters of the sign language, at the same time, at the LCD level, the letters corresponding to each sign will appear. The letters appear on the LCD according to the degree of

bending of the tensometric marks, attached to the glove. This device also improves the quality of life of people with speech impairments, because they can be understood much more easily by the people around them, who do not know the sign language. As improvements, in the future, besides the display system of the text translated from sign language, we would like to add an audio system, which will exactly reproduce the words, intended for the blind people.

RO.59.

Title EN **Novelty in the non-surgical treatment of pressure ulcers using combined biostimulation low-level laser therapy and TENS electrostimulation**

Authors Ilie Onu, Anca-Irina Galaction

Institution “Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering

Description EN Pressure ulcers are localized lesions of the skin and / or underlying tissue. They remain a major cause of morbidity and mortality and usually occur over a bony prominence and are caused by pressure, friction or shear forces. The non-surgical care is performed in stage I and II, the healing rate being 70% - 90%. In stage III and IV, the lesions may require surgery. Standard treatment of pressure ulcers is made with wound cleaning solutions, mechanical and enzymatic debridement, transparent adhesive dressings, antibiotics and surgery. The healing process of pressure ulcers is rather slow, the main objective is to accelerate healing reduce pain and infections. Low-level laser therapy (LLLT) and TENS are considered adjuvant treatment techniques, along with other therapies such as ultraviolet, hyperbaric therapy, ultrasound etc.

TENS electrostimulation intervene in the inflammatory, proliferative, epithelialization and remodeling phase. LLLT applied at an appropriate dose stimulates the cellular functions are vital to the progress and evolution of the healing process through tissue biostimulation, such as increased mitochondrial ATP production, activation of lymphocyte and mast cells, and proliferation of fibroblasts and other cells.

The novelty is the conception of an optimal physiotherapeutic protocol using the combination LLLT - TENS during the standard treatment, reducing the local pain and accelerating the healing process in stages I, II and III.

Class

4

RO.60.**Title EN****SYSTEM FOR GAIT ANALYSIS USING KINECT****Authors**

Simion Mădălina-Petronela, Fuior Robert, Mitocariu Adina-Ecaterina, Atodiresei Irina

Institution**“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering****Description
EN**

The analysis of the human walk is one of the most intensively analyzed aspects in different technological activities and maneuvers because it has an important effect on the quality, accuracy and ergonomics of the human activities. The information obtained by measuring the plantar pressures are important in the research activities, in static and dynamic for the diagnosis of foot problems, biomechanics, accident prevention. Our study purposes the evaluation of the movement of the lower limb using force sensors and video camera (Kinect). The subject has attached the force sensors to the soles that will analyze the plantar pressure. In the same time, he has to walk following the doctor's instructions and his movements are monitored by kinect and displayed through a 3D visualization platform, blender. This system combines informations of leg biomechanics and how subject's foot makes contact with the ground during normal walking. The purpose of this study is to make an important contribution to improving the way doctors diagnose and treat mobility problems, giving them additional information on how a patient is going. Normal technology for this kind of devices is quite expensive and we try to lower the cost of the equipment used as much as possible while maintaining the quality of the results at the above average. If this current version of our device will end up helping people our next step will be perfecting it and making it more patient friendly while at the same time creating a better infrastructure.

Class

4

RO.61.**Title EN****PERSONALIZED GLOVER FOR RECOVERY PATIENTS POST-STROKE****Authors**

Luca Cătălina, Nechifor Ana-Maria, Lovin Bianca, Palel Gabriel

Institution**University of Medicine and Pharmacy GRIGORE T. POPA Iasi****Description
EN**

Stroke is the leading cause of adult disabilities and the third leading cause of death worldwide. Hemiplegia is the frequent stroke deficit whereby the survivor loses control of the skills required for daily activities. This prototype aims to combine medical recovery procedures with new technologies in a personalized scheme adapted to the particularities of the disease

and the patient for an optimal, efficient and operative result. Planning a rehabilitation treatment to regain the skills that the patient has lost is necessary to quantify the movements of the hand that he is able to perform. To this end, we have developed a sensory glove and to maximize recovery I have proposed some essential exercises in which the patients get involved during the recovery, both between sessions and after the treatment. The system proposed by us is in the form of a glove with sensors capable of transposing movements captured in hand gestures, as a basis for the control and rehabilitation function. The proposed system is capable of detecting flexion, movement of the fingers and grasping force, which combined with the manual therapy applied in the rehabilitation of the upper limb increase the chances of rapid recovery of hemiplegic patients.

Class

4

RO.62.

INFRARED THERMOGRAPHY USE FOR POSTOPERATIVE MONITORING OF RAT SKIN FLAPS COMPERING EFFECTS OF VASOACTIVE DRUGS

Title EN

Authors

Cătălina LUCA, Ioannis GARDIKIOTIS, Ioana-Cezara CABA, Ionela-Lăcrămioara ȘERBAN, Bogdan CABA

Institution

University of Medicine and Pharmacy GRIGORE T. POPA Iasi

**Description
EN**

The technologies used in flap design and monitoring have progressed significantly in recent years. Extremely variable vascular anatomy, associated with the complexity of modern flaps, require dynamic, real-time intraoperative information about flap perfusion and hemodynamic changes. Unfortunately, most surgeons still evaluate flap perfusion and viability based solely on clinical experience. Incorrect preoperative planning and intraoperative or postoperative assessment of perfusion leads to major complications for the patient. Nowadays, surgeons can use several systems capable of evaluating the flaps. The evaluation of the viability of a flap, especially in the case of clinical studies in which various substances are applied, that may or may not improve microcirculation is of certain importance. The purpose of this experimental study was to show that infrared thermography can be used as a non-invasive method to assess the flap survival and perfusion and to compare the use of various vasoactive drugs in improving the survival of skin flaps, on rats

Class

4

RO.63.

Title EN **Devices associated with occupational therapy used in the recovery of prehension of the handicapped hand/ disabled hand**

Authors Rotariu Mariana, Ionițe Cătălin, Condurache Iustina

Institution “Grigore T. Popa” University of Medicine and Pharmacy of Iasi, Faculty of Medical Bioengineering

ADLs are activities common to all people, which they perform on a regular basis to lead an independent life. An essential role in the achievement of ADLs has prehension – motor skill which helps the hand to grasps objects with the fingers.

Occupational therapy, the branch of medical recovery, has as main objective the re-education of the prehension. The use of various activities such as browsing books, cutting paper and cutting paper in a shorten shape, making paper balls, making toys and handmade objects, making lego-type constructions, sewing, braiding, plasticine modeling and clay proved to be effective in this sense.

Description EN In this direction we designed and realized in the occupational therapy laboratory, from the Faculty of Medical Bioengineering - three devices - ergonomic wall plates, meant to offer a variety of techniques and exercises, a flexible working environment with illustrations and explanations that allows/helps the recovery of pre-tension. The tiles are made of wood, provided with various aids that simulate daily household activities when they are used.

The elements are fixed to three panels: button system, staples system, horizontal laces, cross laces, quick release loop, adjustable strap, zipper, snail screw with adjustable strength, window handle, door handle, rotary latch, sliding latch, electric sliding lock, power plug with an adapter, wall spiral, lego. The sizes of the plates are different and depend on the number of devices attached.

By using the devices attached to the plates during the kinetics sessions, the patients are using known motor skills and they manage to recover much faster the pre-extension including the ADLs becoming independent, independent persons capable of professional reintegration.

Class

4

RO.64.**Title EN****Silicone scleral buckle extrusion in the context of phthisis bulbi****Authors**

Alexa Anisia-Iuliana^{1,2}, Bogdanici Camelia Margareta^{1,2}, Cantemir Alina³, Maxim Oana Georgiana², Sandu Calina-Anda, Severin Florentina^{1,2}, Belibou Madalina Ioana²

Institution

1. “Grigore T. Popa” University of Medicine and Pharmacy Iasi, Romania
2. “Sf. Spiridon” Emergency Hospital Iasi, Romania
3. Oftaprof Clinic Iasi, Romania

**Description
EN**

A 70-year patient presents in our service accusing intermittent pain and discomfort of the right eye with the onset approximately two years ago. The ophthalmologic examination reveals in the right eye a visual acuity of no light perception and in the left eye no pathological changes.

The right eye is congested, with muco-purulent discharge, the globe has aspect of phthisis bulbi, confirmed by echography. In the inner angle we observed a brittle, translucent, foreign body eroding the conjunctiva. We insist in our discussion with the patient about her medical history and she remembers that 10 years ago she underwent surgery in the right eye for a retinal detachment. We decided to operate, extract the silicone band that was wrapped on 360° around the eye and reconstruct the integrity of the conjunctiva. The fragments from the silicone band were extracted and evaluated microbiologically with no evidence of gram-positive and gram-negative bacteria. The patient received preoperative and postoperative treatment both oral with ceftriaxone and local with instillations of moxifloxacin, tobramycin and dexamethasone. The evolution was favorable in the 6 months follow up period.

Scleral buckling is an ophthalmological surgical procedure used for treating rhegmatogenous retinal detachment. In the case presented above the buckling procedure was done with a silicone band attached to the sclera with sutures. Silicone is a biocompatible material and our case highlights a rare complication.

We address the possibility of a correlation between the extrusion of the band and phthisis bulbi: while the diameter of the eye is reduced, the arc of circle formed by the band wrapped around the eye maintains its diameter, this results in a disproportion and leads to the erosion of the conjunctiva by the band. In conclusion, patients with scleral buckling on an atrophic globe need a long term follow-up in order to be able to observe a potential extrusion of the silicone scleral buckle band and treated it promptly.

Class

4

RO.65.**Title EN**

Impacted canine transplatation an alternative option to orthodontic anchorage

Authors

Lungu Bogdan Vasile¹, Dodi Andreea¹, Ciureanu Ioan Adrian², Alexa Anisia-Iuliana^{2,3}

Institution

1. Evosmile Dental Clinic Iasi, Romania
2. “Grigote T. Popa” Univeristy of Medicine and Pharmacy Iasi, Romania
3. “Sf. Spiridon” Emergency Clinic Iasi, Romania

**Description
EN**

Dental transplantation is a surgical procedure in which an extracted tooth is replanted in a new alveolus in the same patient. A 12-year-old patient presents mandibular and maxillary dento-alveolar incongruence and persistence of the temporary canines on the lower arch. Radiological examinations Cone Beam Computer Tomography shows the definitive inferior canines located horizontal intraosseously on the mandibular midline with the dental crowns in relation to the apical part of the roots of the lower central incisors. Temporary lower canines show physiological resorbition. Preparatory orthodontic treatment for transplant surgery has been initiated. Extraction of the impacted canines and temporary left canine and preparation of a neoalveolus, endodontic treatment of permanent left canine, apical sealing with Aggregate Mineral Trioxide and transplantation of the tooth were performed. In the remaining bone defects we performed bone augmentation. The tooth transplanted is immobilized orthodontically. The postoperative evolution is favorable for a follow-up period of 2 years.

The particularity of the case is given by the topography of the dental inclusions, less common at the mandibular level, but also by the therapeutic approach. In the scientific literature, some orthodontic treatments by anchoring the impacted teeth and alignment on the arch have been reported, but not by dental transplantation as was done in our case. The choice to transplant only the lower left canine was taken because we could create in this case a safe neoalveola in the autologous bone at distance from the resulting cavity after the canine odontectomy.

Therefore, the presented case shows a new perspective on the therapeutical approach of the impacted inferior canines that are not suitable for orthodontic anchoring due to the risk of compromising the lower frontal incisors.

Class

4

RO.66.

Title EN	Venous insufficiency ulcer. Chiva & negative pressure treatment
Authors	<i>Cozmanciuc Gabriela, Olariu Oana, Severin Florentina, Alexa Anisia Iuliana, Ciureanu Ioan Adrian</i>
Institution	Inimed 360° - Cardiovascular Medicine
Description EN	<p>The ambulatory conservative hemodynamic treatment of venous insufficiency, also known as CHIVA method, is a surgical treatment that has been developed in 1988 by dr. Claude Franceschi in France. The philosophy of CHIVA treatment is based on a minimally invasive technique and it is used in the conservative treatment of varicose veins and restores the hemodynamics. There are no surgical contraindications either related to age or associated pathologies. Preoperative the patients were marked during Doppler ultrasound examination. Interventions were performed with sedation and local anesthesia. The patients were discharged two hours after surgery. In the patients with leg ulcers we recommend also the negative pressure treatment (100 - 150 mmHg) and dressing change at 48 - 72 hours. After 14 days we have significant ulcer healing and after 4-6 weeks of the intervention the diameter of affected veins was normalized. In 3 months we obtained great improvement and no varicose veins. With this treatment the venous function is considerably improved and aesthetic results obtained are excellent. CHIVA technique is an ideal treatment of recurrent ulcers.</p>

Class 4

RO.67.

Title EN	Computer tomography as a positive prognostic factor in complex cervical trauma
Authors	<i>Severin Florentina, Alexa Anisia-Iuliana, Dan Mihail Cobzeanu</i>
Institution	Universitatea de Medicină și Farmacie “Grigore T. Popa”, Iași
Description EN	<p>Computer tomography examination with or without direct laryngoscopy is sufficient to diagnose laryngeal or laryngotracheal lesions. Classically, digestive lesions were diagnosed by esophagography, a method with 70-80% specification, but computer tomography and angiographic examinations have a diagnostic sensitivity and specificity of almost 100% Indication of surgical exploration of a penetrating cervical trauma, after performing preoperative computer tomography, is an approach, who is related to the affected</p>

NATIONAL

cervical area and to the lesion described in order to avoid formal and unnecessary surgical exploration. In view of the above studies, compared to the results obtained in our study, we can use computer tomography scans to record a sensitivity and specify with 60% and 98%, respectively, falling within the value range of the studies exposed.

The use of imaging paraclinical explorations in the diagnosis of complex cervical traumatic lesions is a positive prognostic factor in the evolution of this pathology.

Class

4

RO.68.

Title EN

The role of T-scan in the assessment of patients with orofacial dysorders

Authors

Dragoș Frățilă, Dragoș Virvescu, Claudiu Topoliceanu

Institution

U.M.F. "Grigore T.Popa" Iasi, Faculty of Dental Medicine
 AIM OF STUDY was to demonstrate the possibilities to use the device T-SCAN III (TekScan, USA) in the evaluation of the force, timing and distribution of the occlusal forces in a group of patients with orofacial dysfunctions. MATERIAL AND METHODS. Study group included 20 patients with orofacial dysfunctions (muscular/ATM pain or discomfort, laterodeviations) due to partially edentations or iatrogenic fixed partial dentures. Patients were programmed for prosthetic treatment with fixed partial prosthesis or removable partial denture. T-SCAN was used to record on graphs the distribution of occlusal forces on molars, premolars and anterior teeth. The system T-SCAN allowed the calculation of occlusal forces intensity and their distribution on all dental groups. The results were statistically analyzed. RESULTS. The use of T-SCAN measurements indicate the existence of orofacial disorders in 95% of edentulous patients. T-SCAN graphs recorded the distribution of occlusal forces intensity as follows: 54% right arch vs 46% left arch. Significant statistical differences were recorded between the intensity values of occlusal forces recorded on right arches and left arches. CONCLUSIONS. T-SCAN use for patients with orofacial disfunctions proves the existence of different intensity of relative occlusal forces between homologous teeth, significantly statistic only for premolars. T-SCAN use allows detection of premature occlusal premature contacts and interferences to patients with orofacial disfunctions.

**Description
EN**

Class

4

RO.69.**Title EN****MECHATRONIC DEVICE FOR BREATHING FLOW SIMULATION WITH FIRST AID APPLICATION****Authors**

Dimitrie-Cristian FODOR

Institution**Faculty of Medical Bioengineering, “Grigore T. Popa” University of Medicine and Pharmacy Iasi, Romania****Description EN**

Medical emergency simulation provides a learning opportunity for controlled clinical practice without putting real patients or others subjects at risk. Simulation of cardiopulmonary resuscitation (CPR) maneuvers allows training to be targeted to the need of the future rescuer, not the patient, allowing multiple practice attempts in order to achieve necessary competence. Learners are given “permission to fail” and to learn from these exercises, something which is undesirable in medical clinical practice.

The basic life support (BLS) provides that the rescuer checks the presence of the victim's breathing and determines its frequency, in order to respect the resuscitation protocol. For this, we were able to design and implement a breath simulator in an innovative, interactive and easy-to-use form in first aid training centers at an affordable price. The simulator contains a microcontroller that controls an air supply source (negative pressure for inhalation, respectively positive pressure for exhalation). The respiratory medium is aspirated or evacuated to the outside through artificial superior airways using a solenoid valve system. With the help of this simulator, which is implemented in an anatomical model, the resuscitator exercises and learns to differentiate normal breathing (when the victim will be placed in the recovery position - RP) from superficial or irregular breathing (gasping - in which case it is performed CPR).

The system comes to the aid of the rescuer who needs to be trained on how he can detect breathing: tracking chest movements, listening to respiratory sounds, and sensing air flow from peripheral airways. We appreciate that the Technology Readiness Level is 5 (out of 7), as the prototype was validated by specialists in the field of emergency medicine (the system was tested within the Romanian Red Cross – Iasi Branch).

Class

4, 12

**“Carol Davila” University of Medicine and Pharmacy,
Bucharest, Romania**

RO.70.**Title EN**

Biocompatible oil in water microemulsions with hyaluronic acid and salicylic acid and method for obtaining thereof

Authors

Dinu-Pîrvu Cristina Elena, Popa Lăcrămioara, Ghica Mihaela Violeta, Anuța Valentina, Prisada Răzvan-Mihai, Velescu Bruno Ștefan, Talianu Marina-Theodora

Institution

“Carol Davila” University of Medicine and Pharmacy, Bucharest,

Patent

A 176 / 01.04.2020

The invention refers to a biocompatible oil in water (O/W) microemulsion, with hyaluronic acid and salicylic acid, designed for topical application in dermatologic therapy of acne and a method for obtaining thereof.

The technical issue solved by the invention consists in: (i) designing a topical system as oil in water microemulsion, (ii) selection of two phases, an aqueous and an oil phase, a surface active mixture formed by two surfactants and a cosurfactant, the selection of a biopolymer and an antiacne active, combined in various ratios in order to obtain stable systems characterized by adequate physico-chemical parameters, which can ensure the topical application and the obtaining of a superior action in acne treatment.

Description EN

The following advantages result from the invention:

- the topical use of a biocompatible O/W microemulsion which may incorporate (i) an antiacne active, namely salicylic acid 0.5%, due to a surface tension modulator system with solubilization capacity and diffusion promoting properties through stratum corneum;
- minimizing the adverse reactions of salicylic acid like erythema or dryness by the integration of (ii) hyaluronic acid as a biopolymer with hydrating, protective and resurfacing properties;
- the biocompatibility of surface tension mixture is also defined by (iii) the association of Tween 80 as a non-ionic surfactant with lecithin as a natural zwitterionic surfactant; the tensioactive mixture content is selected under the maximum required value of 70 %.

Class

4. Medicine - Health Care – Cosmetics

RO.71.**Title EN**

Collagenated textile meshes impregnated with minocycline for surgical use and process for their preparation

Authors

Marin Ștefania, Albu Kaya Mădălina Georgiana, Ghica Mihaela Violeta, Udeanu Denisa Ioana, Constantin Vlad Denis

Institution

Division Leather and Footwear Research Institute, National Research and Development Institute for Textile and Leather, University of Medicine and Pharmacy “Carol Davila”, „Sf. Pantelimon” Emergency Clinical Hospital,

Patent

A 00755 / 27.09.2017

Description EN

The invention refers to the use of collagenated meshes impregnated with minocycline in general surgical procedures for the treatment of abdominal hernia and the formulation process. The technical issue solved by the proposed invention consists in the formulation of a delivery system of an antibiotic with broad spectrum (minocycline) from a polymeric support developed as textile mesh functionalized by collagen and cross-linked in a specific manner to simultaneously ensure controlled drug delivery and collagenic film degradation, in order to treat the potential infection and to regenerate the damaged tissue after the surgical intervention.

The following **advantages** result from the invention:

- providing a topical treatment for abdominal hernia or associated postoperative infections consisting of drug delivery systems ensuring the minocycline local and improved release to affected tissues and maintaining an optimal and effective concentration of antibiotic to the application site, from a polymeric film obtained from collagen as natural biopolymer added on a surface of a synthetic textile mesh;

- the antibiotic topical use is more advantageous compared to the systemic administration due to the avoidance of adverse and toxic reactions, of first hepatic passage consequences, elimination of intravenous therapy risks and inconvenients therefore increasing the patients compliance.

- the synthetic collagen meshes provide a favorable environment for tissue regeneration, their biocompatibility decreases the rejection risk by the organism, while their biodegradability promotes the cells matrix regeneration in a couple of months. Also such meshes are toxicity free and release the drug in a controlled manner.

Class

4. Medicine - Health Care – Cosmetics

RO.72.**Title EN**

Trivalent chromium compound with antiadipogenic activity and process for synthesis

Authors

Uivarosi Valentina, Galateanu Bianca, Munteanu Alexandra-Cristina, Hudita Ariana, Velescu Bruno Stefan, Vatavu-Ghitoi Valeria Nicoleta

Institution

“Carol Davila” University of Medicine and Pharmacy, Bucharest,

Patent

A 00177 / 01.04.2020

**Description
EN**

The invention refers to a chromium(III) complex, to a process for its synthesis and to the evaluation of the antiadipogenic action, with respect to the therapeutic potential.

Cr (III) compounds, especially complex combinations due to their improved absorption, have been found to cause weight loss, increase muscle mass and improve the symptoms associated with type II diabetes. Given that the development of adipose tissue results in part from the differentiation of cellular precursors, the development of compounds capable of inhibiting adipocyte differentiation is of practical interest in the fight against excess weight, but also related diseases.

The Cr(III) compound which is the subject of the invention is a Cr(III) complex with 5-hydroxyflavone (Primuletin, Pri) with the general formula: Cr(Pri)_3 .

The process of preparing the complex consists in dissolving the 5-hydroxyflavone ligand (Primuletin, Pri) in ethanol in the presence of triethylamine, adding the solution thus obtained to an ethanolic solution containing CrCl_3 , for a ligand:metal ion molar ratio of 3:1 and refluxing the final mixture until a red crystalline precipitate is obtained. The obtained hardly soluble compound was filtered off, washed with ethanol and dried by storage in a dessicator at room temperature. Another object of the invention is the use of the chromium(III) compound with 5-hydroxyflavone as an agent with antiadipogenic activity, useful in the treatment of obesity. The influence of the Cr(Pri)_3 compound in the dynamics of the adipogenic differentiation process is highlighted by the evaluation of intracytoplasmic lipid accumulations (characteristic for mature adipocytes) and the expression of perilipine as a marker of adipogenesis.

Class

4. Medicine - Health Care – Cosmetics

RO.73.**Title EN**

O-aryl-carbamoyl-oxymino-dibenz[b,e] oxepines, a pharmaceutical composition containing them and their use

Authors

Uivarosi Valentina, Galateanu Bianca, Munteanu Alexandra-Ilinca Margareta VLAD, Carmen LIMBAN, Diana Camelia NUȚĂ, Cornel CHIRIȚĂ, Dana Cristina MARINECI, Emil ȘTEFĂNESCU, Miron Teodor CĂPROIU, Constantin DRĂGHICI, Florea DUMITRAȘCU, Mariana Carmen CHIFIRIUC, Luminița MĂRUȚESCU, Speranța AVRAM, Cristina Elena DINU-PÎRVU, Alexandru Vasile MISSIR

Institution

“Carol Davila” University of Medicine and Pharmacy, Bucharest

Patent

A00859/01.11.2018

Description EN

Development of original prototype molecules representing effective therapeutic solutions in the case of infections with micro-organisms with multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria and in the same time to prevent the permanent risk of the emergence of new resistance mechanisms, is a priority direction for research into new antimicrobial chemotherapeutics with maximum efficacy and low toxicity.

The invention relates to O-aryl-carbamoyl-oxymino-dibenz[b,e]oxepines having in a single molecule several biologically active fragments: the condensed heterocyclic system having an oxygen in the bridge (dibenz[b, e]oxepinic system) and carbamoyl pharmacophore and oximine groups.

The new O-(arylcarbamoyl)oximes of 2(un)substituted 6,11-dihydro-dibenz[b, e]oxepin-11(6H)one have been synthesized and physico-chemically and biologically characterized, in order to develop new compounds and new strategies to combat pathogens biofilms frequently involved in the etiology of chronic infections as well as in the treatment of infections caused by strains that have acquired antibiotic resistance. The new compounds were in silico analyzed, in vivo evaluated for the determination of acute toxicity and tested for antimicrobial activity on bacterial and fungal strains in planktonic and adherent state, as well as for the in vitro determination of their cytotoxicity.

The problem which the present invention solves consists in the synthesis of new compounds with low toxicity and demonstration of their antimicrobial effect on reference strains, as well as on microbial strains recently isolated from the clinic with multidrug phenotypes in the main classes of known antimicrobial agents for which there is no therapeutic alternative.

Class

4. Medicine - Health Care – Cosmetics

RO.74.

Title EN

New miniplate for osteosynthesis of mandibular angle fractures designed to improve formation of new bone

Authors

Teodora Silagieva Pituru

Institution

“Carol Davila” University of Medicine and Pharmacy, Bucharest

Patent

131308/17.02.2015

**Description
EN**

A miniplate was designed to obtain maximum strains developed in the cortical bone near the fracture line during biting to keep values below the threshold causing bone resorption. Its geometry minimizes the peak forces that can develop during most cases of mandible biomechanical loadings. A three-dimensional osteosynthesis finite element model for a human mandible confirmed the operational effectiveness of the miniplate. Prototypes, were tested on fractured sheep mandibles, fixed in a purpose-built jig, to loads up to 150% of the maximum forces developed by human patients. The tests indicated good fracture stability at more than 350N. The new design is has the potential to reduce stain near the fracture line to a minimum by controlling the direction and reducing the value of the forces in the screws near the fracture line. It reduces healing time and allows good quality of the newly formed bone.

Class

4. Medicine - Health Care – Cosmetics

RO.75.

Title EN	Supporting excellence in Health domain by optimizing preclinical experimental models
Authors	
Institution	“Carol Davila” University of Medicine and Pharmacy, Bucharest, 37 Dionisie Lupu Str., 020021, Bucharest, Romania, e-mail: rectorat@umfcd.ro
Patent	Project FDI-2020-0526 The aim of the project is to offer an adequate support for research activities within "Carol Davila" University of Medicine and Pharmacy in Bucharest (UMFCD), emphasizing the optimization of preclinical experimental models (<i>in silico</i> , <i>in vitro</i> , <i>in vivo</i>) used in Health domain, in order to increase the complexity of research, and ensuring an efficient transition between basic and applied research.
Description EN	Project objectives: O1. Stimulating interdisciplinary excellence activities. O2. Optimising the performance of research infrastructure by improving functionality of existing equipments. O3. Ensuring the proper functioning of the biobase within the UMFCD. O4. Providing support for excellence in research based on increasing the results impact, through publication in red/yellow journals or patents.
Class	

RO.76.

Title EN	Toothpaste with bee bread (fermented bee pollen)
Authors	Ioniță Ana Corina, Mititelu Magdalena, Dogaru Elena, Dinu-Pîrvu Cristina Elena
Institution	“Carol Davila” University of Medicine and Pharmacy, Bucharest,
Patent	126742/2014 The invention refers to a toothpaste composition containing natural compounds, with antifungal, anti-inflammatory, immunomodulatory, healing and calming effects, intended for oral cavity hygiene. The product has homogeneous macroscopic aspect, white-yellowish color, sweet taste, aromatic characteristic smell.
Description EN	The natural origin products present in the toothpaste composition are Bee Bread (Naturally fermented bee pollen) and Clove essential oil. The bioactive components were

incorporated into a base containing carboxymethylcellulose, glycerin, propylene glycol, sodium bicarbonate, calcium carbonate, sodium lauryl sulphate and sodium metabisulfite.

The product antimicrobial and antifungal effects of was proved against *Staphylococcus aureus*, *Bacillus subtilis*, *Candida sp.*, *Cryptococcus neoformans* and *Aspergillus niger*.

Class

4. Medicine - Health Care – Cosmetics

RO.77.

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

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 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).

Class

4. Medicine - Health Care – Cosmetics

Transilvania University of Brasov

RO.78.

Title EN

Towards Environmental, Social, Governance Marketing: a new way to satisfying the needs of consumers.

Authors

VLAD Vicentiu Cosmin¹, LUCA Florin-Alexandru²

Institution

¹ *Universitatea Transilvania Brasov (ROMANIA)*

² *Technical University "Gheorghe Asachi" of Iasi (ROMANIA)*

**Description
EN**

Incorporating driven forces as environmental concerns into marketing strategies, principles and values is a practice that developed in the 80s. Meanwhile, marketing has gained traction and importance bringing a deeper understanding of the relationship between the environment, society, and the economy. It evolved over time, shaping continuously the concept of "Green marketing" and moving into another dimension of "Sustainable marketing". Marketing and marketers are not statics and the evolution has continued to adapt to the needs of customers and consumers, taking into consideration more components as the governance one, and designing the new field for "Environmental, Social, Governance (ESG) marketing". The research analyzes this transition through these three stages and their implication for marketing: 1) Green marketing, a wider initiative concentrated to reduce the consumers' dependence on non-green products or services and to normalize the environmental damage creating green opportunities with competitive advantage; 2) Sustainable marketing, a broader approach with the aim to create a sustainable economy that is sustainable maneuvering with the environmental costs of the product life cycle. 3) ESG marketing, the holistic management process responsible for identifying, anticipating, and satisfying the needs of customers and society, focusing on Environmental, Social, and Governance factors that generate positive and measurable impact.

Class

14

Ștefan cel Mare University of Suceava

RO.79.	
Title EN	Device for continuous skeletal traction
Authors	CENUȘĂ Mihai, POIENAR Mihaela, MILICI Laurențiu Dan, RAȚĂ Mihai, IRIMIA Daniela, PENTIUC Radu Dumitru, LUPU Elena Daniela, AFANASOV Ciprian
Institution	Ștefan cel Mare University of Suceava
Patent no.	Patent application No. A/00579/2019
Description EN	The device for continuous skeletal traction consists mainly of an electromagnet, an adjustable voltage source controlled by a voltage, a potentiometer, a programmable automatic with a display panel, a distance sensor, a support and guide system and a towed element, whose tensile strength is established according to the instructions of the specialist doctor for the correct positioning of the limb.
Class no.	4

RO.80.	
Title EN	Automatic de-icing device for power transmission lines
Authors	CENUȘĂ Mihai, POIENAR Mihaela, MILICI Laurențiu Dan, GRAUR Adrian, UNGUREANU Constantin, ATĂNĂSOAE Pavel, BOBRIC Crenguța Elena, POPA Cezar Dumitru
Institution	Ștefan cel Mare University of Suceava
Patent no.	Patent application No. A/00580/2019
Description EN	The automatic device for opening the overhead power lines consists of a metallic cylindrical part, a helical spring, dynamometric compression springs, a movable part and a guide system. When the layer of ice (rime) reaches the set weight (calculated), the dynamometric spins release the moving part that strikes the fixed part, and the impact between the moving part and the fixed part leads to the release of ice from the conductor of the electric line.
Class no.	2. Energy and sustainable development

RO.81.

Title EN	Automatic command control system
Authors	TOADER Eusebiu, POIENAR Mihaela, MILICI Mariana Rodica, RAȚĂ Gabriela, PRODAN Cristina, VLAD Valentin, NIȚAN Ilie, UNGUREANU Constantin
Institution	Ștefan cel Mare University of Suceava
Patent no.	Patent application No. A00581/2019
Description EN	The automatic control system consists mainly of a lever system, provided with a microcontroller acquisition of the electrodermal signal, taken with two electroconductive sensors from a biocompatible material, an adapter circuit and a force sensor through which determines whether the user commands are valid or the lever was accidentally triggered.
Class no.	5: Industrial and laboratory equipments

RO.82.

Title EN	System for monitoring the activity of a person in the office
Authors	MILICI Laurențiu Dan, POIENAR Mihaela, NIȚAN Ilie, UNGUREANU Constantin, GROSU Oana Vasilica, POCRIȘ Marcel, TOADER Eusebiu Vasile, MEDRIHAN Dumitru Nicolae
Institution	Ștefan cel Mare University of Suceava
Patent no.	Patent Application No: A/00146/2020
Description EN	The system of monitoring the activity of a person in the office consists of a chair that has the seating area made of two overlapping plates, separated by four fittings, between which are placed, on the corners of the plates, four force sensors and an acquisition microsystem microcontroller that transmits the acquired data to a computer for storage and processing.
Class no.	2: Energy and sustainable development

Regele Mihai I al Romaniei
Banat University of Agricultural Science
and Veterinary Medicine, Timisoara

RO.83.	
Title EN	Tomato hybrid USAB 29- Romanian Tomatoes for supermarket and industrialization
Authors	Ciulca Sorin, Sumalan Radu, Popescu Cosmin, Bodnarescu Florin, Sumalan Renata
Institution	Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara
Patent no.	4022/20.05.2019- certificate regarding the registration of the USAB 29 tomato hybrid, issued from "The State Institute for Testing and Registrating of Varieties" from Romania
Description EN	Tomato hybrid USAB 29- is the result of the breeding work for improvement of romanian tomatoes old varieties and heirlooms. The main qualities following the breeding of this hybrid were related to the nutritional value, the fruits firmness, the post-harvest storage period and the tolerance to biotic and abiotic stressors. The tomato plants have indetermined growth type, with the medium stem and anthocyanin coloring in the upper third. Leaves of large size, bipenate, coloured intense green. The fruits have large size, flattened shape, intense red color, glossy, with thick pericarp and a strong firmness. The flowering and ripening period is medium. The hybrid was created especially for intensive cultivation in field and greenhouse conditions, for fresh consumption or processed, having very good nutraceutical qualities (ascorbic acid, lycopene, beta-carotene and phenols).
Class no.	3
RO.84.	
Title EN	Sorada tomato hybrid - tasteful tomatoes from the grandma's garden
Authors	Sumalan Radu, Ciulca Sorin, Radulov Isidora, Bodnarescu Florin, Ciulca Adriana
Institution	Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara
Patent no	4019/20.05.2019- certificate regarding the registration of the

Description EN	<p>Sorada tomato hybrid, issued from "The State Institute for Testing and Registrating of Varieties" from Romania.</p> <p>Sorada is a tomatoes hybrid obtained by crossing some old local populations from Banat. He has inherited from the parental forms the tolerance to diseases and pests, the high adaptability to the specific conditions of climate and soil, the taste, the aroma and the special flavor, specific to the tomatoes from the grandmother's garden. The plants of this hybrid have indetermined growth, with the strong stem and anthocyanin coloring in the upper third. Leaves of large size, bipenate, coloured intense green. The fruits have medium size, intense red color, glossy, with thick pericarp and reduced firmness. The flowering and ripening period is medium.</p> <p>The Sorada hybrid was created especially for growing in family and small vegetable farms, with traditional technologies, organic fertilizers and minimal pesticide treatments. It ensures good and quality productions, both by cultivating in protected areas (greenhouses) as well as in the field. Tomatoes that respect the concept - "from the household directly to the plate ..."</p>
Class no.	3
RO.85.	
Title EN	<p>Natural preparations with antifungic action used as protection agents in leguminous cultures</p>
Authors	<p>Alexa Ersilia¹, Sumalan Renata Maria¹, Lintia Vasile², Negrea Monica¹, Obistioiu Diana¹, Poiană Mariana Atena¹, Rus Cristian¹, Tulcan Camelia¹</p> <p>¹<i>Banat's University of Agricultural Science and Veterinary Medicine "King Michael I of Romania" from Timisoara, Romania</i></p> <p>² <i>S.C.Panetone S.R.L.</i></p>
Institution	<p>¹<i>Banat's University of Agricultural Science and Veterinary Medicine "King Michael I of Romania" from Timisoara, Romania</i></p>
Patent no.	OSIM RO 133305 A0, RO-BOPI 5/2019.
Description EN	<p>The invention relates to natural products with antifungal action (NPA) based on essential oils (UEs) from medicinal and spicy plants belonging to Lamiaceae and Umbelifere families which exert a protective effect against the species of fungi Verticillium dahlie from vegetable crops developed in</p>

protected areas or open fields, as well as to a process for obtaining the NPA through a method compatible with organic farming. Verticilliosis is an infectious disease of plants, affecting over 300 plant species, mainly caused by *Verticilium dahliae*, whose mycelium develops in the driving organs and blocks the circulation of sap. The use of natural preparations in the prevention of biological pollution of products of plant origin is of particular importance in promoting organic farming and a healthy lifestyle.

Class no.

3

RO.86.

Title EN

Apricots Delights

Authors

Drugă Mărioara, Dumbravă Delia Gabriela, Moldovan Camelia, Botău Dorica, Ștef Ducu Sandu, Hădărugă Nicoleta Gabriela, Mișcă Corina Dana, Alexa Ersilia Călina

Institution

Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timișoara

Patent

M2020/00776/04.02.2020

**Description
EN**

Apricots Delights is an innovative product in the category of sweet-sour-spicy sauces, obtained from apricots and natural spices. The product has a fine consistency, is aromatic, gives a special flavor to the food with which it is consumed. The product is rich in polyphenols and has high antioxidant activity. Contains no preservatives or other synthetic food additives.

Class no.

3

RO.87.

Title EN

SEA FLAVOR

Authors

Dumbravă Delia-Gabriela, Alexa Ersilia-Călina, Botău Dorica, Cocan Ileana, Dogaru Diana- Veronica, Drugă Mărioara, Mișcă Corina-Dana, Moldovan Camelia, Negrea Monica, Popa Viorica Mirela, Raba Diana Nicoleta, Rinovetz Alexandru Erne

Institution

Universitatea de Științe Agricole și Medicină Veterinară a Banatului "Regele Mihai I al României" din Timișoara

Patent

Marcă înregistrată OSIM nr. M2020/00811/ 04.02.2020

Description

A range of innovative pate obtained from seafood, vegetable

EN	oils, natural spices and vegetables, in different assortments according to the manufacturing recipe. The products are both tasty and healthy, being rich in polyphenols, unsaturated fatty acids, quality proteins and having good antioxidant activity.
Class no.	3

RO.88.**Title EN****V-PASS-F****Authors**

Bordean Despina – Maria, Alda Liana Maria, Borozan Aurica Breica, Catargiu Andrei Dorel, Dumbravă Delia Gabriela, Hădărugă Nicoleta Gabriela, Moldovan Camelia, Pintilie Georgeta – Sofia, Pîrvulescu Luminița Cornelia, Popescu Roxana, Raba Diana Nicoleta, Raican Dan – Dorin, Velciov Ariana Bianca

Institution

Banat's University of Agricultural Sciences and Veterinary Medicine" King Mihai I of Romania" from Timisoara, Romania

M2020/00935

**Description
EN**

The product V-PASS-F refers to a functional dietary supplement, semi-prepared, in powder form, obtained from broad bean and soybeans with *Portulaca oleracea* and *Artemisia dracunculus*, without the addition of sugar or salt. The product is obtained at a temperature in which the active ingredients are protected and is intended for people who want to consume healthy functional food, prepared quickly by adding water or milk, or as a base for other foods.

Total antioxidant capacity (TAC) spectrophotometric analysis was performed using CUPRAC method; the absorbance being recorded at 450 nm wavelength. TAC is 2311.215 $\mu\text{mol TE}/100\text{ g Product}$

Total Polyphenols content (TPC) spectrophotometric analysis was performed using Folin–Ciocalteu method the absorbance being recorded at 750 nm wavelength. TPC is 136,71 mg GAE/100 g Product.

RO.89.

Title EN	The development of DNA analysis for taxonomic evaluations on genus <i>Thymus</i>
Authors	BEICU Rodica, BOTĂU Dorica, POP Georgeta, IMBREA Ilinca, IHOS Salvina, POPESCU Sorina
Institution	Banat's University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania” Timișoara The taxonomic interpretation of the species belonging to the genus <i>Thymus</i> (Lamiaceae Family) is very difficult due to the increased variability of the populations, with extremely varied morphological characteristics, but also due to the hybridization of the species. Therefore, DNA analyzes could be a solution for species identification. In our studies 6 ISSR (Inter Simple Sequence Repeats) and 4 ScoT (Start Codon Targeted) markers were used. Based on statistical evaluation of the results (ANOVA) the similarity coefficients were established and a dendrogram was developed emphasizing the correlation both by species and by the location from which they were collected. The analyzed ISSR markers revealed high polymorphism and reproducible genetic profiles, providing a reliable and convincing analysis method for assessing the genetic variability and relatedness of <i>Thymus</i> species.
Description EN	Some ISSR primers (eg UBC855) may be used more effectively in diversity assessment at <i>Thymus</i> . ScoT primers can be used with higher efficiency for estimating interpopulation diversity at <i>Thymus</i> compared to ISSR primers. It seems that between these chromosomal regions there is a higher degree of similarity due to the geographical location, compared to the species / subspecies of which it is considered to belong. Dendrograms allow the assessment of the degree of relatedness of <i>Thymus</i> species. So far no conclusions have been reached regarding the studied subspecies but the analyzes are conclusive at the species level.

RO.90.	
Title EN	Demonstrative model for the calculation of hay production in traditional pastoral systems
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 paper presents a descriptive model, applicable in agricultural practice, for determining the volume of hay obtained on a surface unit, by geospatial methods. Images taken using UAV (drone) technology, processed with specialized software, are used. From point clouds obtained, is created the 3D model of haystacks, based on which the volume is calculated. The geomatic model replaces field visits, as well as empirical measurements and calculations. With this working algorithm, it is possible: volume calculation with very high accuracy, regardless of the objective shape; application on large surfaces; reuse of measurements in other theoretical or practical research or evaluations.
RO.91.	
Title EN	Workflow applied to aerial images to identify invasive species from grassland and changes detection
Authors	Loredana Copăcean, Luminița Cojocariu, Mihai Simon, Cosmin Popescu
Institution	Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara
Description EN	The design of the analysis model was based on problems from agricultural practice: spatial expansion of invasive species, with repercussions on the useful surface of grasslands, but also their dynamics in time. High spatial resolution aerial images and spectral classification procedures were used to identify invasive species. The land cover map with different plant formations was obtained. To analyze the changes, images from different time periods were used. Using the proposed workflow, they can be highlighted. the areas occupied by invasive species, the dynamics of the formations in time and space, the areas that present major risks.
Class no.	4

RO.92.**Title EN**

Technical algorithm for implementing UAV technology in the investigation of pastoral space

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

The idea of investigating grasslands using drones was based on the following considerations: the size and complexity of pastoral space and the need for data acquisition in hard-to-reach areas and in a short time. Point clouds and detailed images, usable in different applications, are obtained. The workflow implies: identifying the areas of interest, planning and setting the flight parameters, "photographing" the area, downloading and processing the images and subsequently processing the results in Geographic Information Systems. It results as follows: topo-cadastral information, pratical information or information useful in territorial planning, with high accuracy and with spatial location, thus represented cartographically.

RO.93.**Title EN**

Model for using LIDAR - Mobile Mapping technology for topographic detail elevations in urban space

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

Regarding the topographic details, usually carried out by GNSS equipment and total stations, the use of Mobile Mapping - LIDAR technology is a real advantage, by: the large size of the investigated area, the complexity of the acquired data, reducing the working time. To exemplify and test the proposed model, an area of Lipova city, Arad County was chosen, which was investigated by mobile scanning with Leica Pegasus Backpack equipment, along with a GNSS Leica Viva GS08 Plus equipment. The model of using LIDAR - Mobile Mapping technology, implies the following workflow:

1. Land recognition to determine how many scans will be made and where the reference station will be located.

2. Scanning the area of interest.
 3. Determination of control points that were subsequently verified on the point cloud.
 4. Post-processing was performed using Pegasus Manager v.2019.1 software and accuracy checking was performed with Novatel Inertial Explorer v.8.8 software.
 5. Extraction of topographic data into Leica Cyclone Model v9.3 software.
 6. Providing the final result using the AutoCAD Map 3D v2016 software.
- Advantages and applicability of using the proposed model:
- The speed of the measurements;
 - Obtaining point clouds, therefore a detailed image, in coordinates of the area of interest;
 - Accuracy of the data obtained;
 - The high degree of detail, gives the possibility to use the images obtained in projects such as construction, design, road infrastructure, geodesy, architecture, cartography, etc.
 - The possibility of using the data obtained in the GIS environment.

Class no.

3

RO.94.**Title EN**

Remote sensing in the analysis and characterization of spatial variability of the territory

Authors

COSMIN ALIN POPESCU, MIHAI VALENTIN HERBEI, FLORIN SALA

Institution

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description
EN**

The present research project used satellite images analysis to evaluation and characterization of land spatial variability in the Livezile-Dolat Protected Area, Timis County, Romania. Based on the spectral information, the indices NDVI, SAVI, NBR, GLI, GNDVI and CIGreen were calculated. On the basis of ISODATA algorithm, an unsupervised analysis was performed, and 15 classes resulted. The coefficient of variation (CV) expressed a high variability in terms of the surfaces size on the set of 15 obtained classes ($CV_{\text{Class}}=43.2658$). Based on the NDVI index, 8 groups of values were obtained, covering an area of 6542.801 ha; 9 groups of values covering the surface of 6555.21 ha in the case of SAVI, and 6 groups of values covering the area of

6542.955 ha in the case of CIgreen were obtained. Data series for each index studied (654361 values per series) were analyzed to evaluate the variance (V) and coefficient of variation (CV). The highest value of the variance was identified for the CIgreen index ($V_{CIgreen}=0.892885$), and the lowest at the GLI index ($V_{GLI}=0.001912$), the other indices having intermediate values of the variance ($V_{GNDVI}=0.013837$, $V_{NDVI}=0.028027$, $V_{SAVI}=0.063048$). Based on the values of the coefficient of variation (CV), a high degree of spatial variability was found in the set of GLI index values ($CV_{GLI}=80.40968$) and the lowest spatial variability in the GNDVI index data set ($CV_{GNDVI}=23.85455$), and intermediate values for the other studied indices ($CV_{NDVI}=28.76762$, $CV_{SAVI}=28.76861$, $CV_{CIgreen}=57.57606$).

Class no. 3

RO.95.

Title EN **Fe₃O₄ – Water based magnetic nanofluid influence on weight loss of wheat seedlings under controlled conditions**

Authors FLORIN SALA, MARIUS BOLDEA, DORICA BOTĂU, AMEDEU PÎRVULESCU, IOSIF GERGEN

Institution Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

Description EN The research project explored the effect of a biocompatible aqueous magnetic nanofluid (MNF) with Fe₃O₄ nanoparticles on wheat seedling, *Triticum aestivum* L. ssp. vulgare, Alex cultivar. The magnetic nanofluid was added in different concentrations (0.0%, 0.05%, 0.1%, 0.5% and 1%) for obtaining water solutions which were used for treating wheat grains by imbibition. Positive effects were registered under MNF on the parameters analyzed, which describe the total drying time (Tt), the drying time needed for reaching the maximum weight loss rate (tm), medium rate (RWLavg), and maximum rate (RWLmax) of weight loss.

Class no. 3

RO.96.

Title EN **Model of Color Parameters Variation and Correction in Relation to “Time-View” Image Acquisition Effects in Wheat Crop**

Authors	FLORIN SALA, COSMIN ALIN POPESCU, MIHAI VALENTIN HERBEI, CIPRIAN RUJESCU
Institution	Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara
Description EN	Many images of agricultural crops are made at different times of the day, images with different spectral information about the same crop in relation to conditions when the picture was taken. A set of 30 digital images of a wheat crop in the BBCH 3-Stem elongation code 32–33 stage was captured between 9 am and 14 (UTC+3), in the 0°-180° variation range of the image acquisition angle on the E-W axis (cardinal directions). A high variation of the spectral data given by the combination of the hour (h) and angle (a) at which the images were captured was found. The interdependence relationship between the analyzed parameters (r, g, and b), and the time (t) and the angle (a) of image acquisition was assessed with the linear correlation coefficient. By calculating the roots of the mathematical expressions of the correlation coefficients dependence on the angles (a) or times of day (t), the optimal angle and time were determined as a combination of the two variables for capturing images and obtaining optimal r_o , g_o , b_o values. The correction coefficients of the normalized r, g, and b values obtained out of the optimal field were determined. To this end, the multiplication of the $r(a,t)$, $g(a,t)$, and $b(a,t)$ values with the $\rho_{a,t}$, $\gamma_{a,t}$, and $\beta_{a,t}$ correction coefficients was suggested to reach the optimal values for sustainable decisions.
Class no.	3

RO.97.

Title EN	Assessment model for the imbalance in n and pk fertilization for maize: case study for the western part of Romania
Authors	FLORIN SALA, CIPRIAN RUJESCU, ANDREA FEHER
Institution	Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara
Description EN	The main aim of the research project was to assess the profit increase in maize, starting from the yield response according to the nitrogen quantity applied on different PK backgrounds. Answers were searched for on the causes for the low interest in applying nitrogen fertilizers for maize in

Romania. Maize yield response curves were determined according to quantities of N and PK. The production functions obtained facilitated the determination of adjusted yield values, based on the N quantities in the 0-200 kg range, active ingredient (a.i.) ha^{-1} for multiples of 50 for different PK levels, within the 0-150 kg range, a.i. ha^{-1} . Four distinct cases were analyzed, the average during 2013-2015 and each year independently. The slope (m), indicating the tangent the straight line creates with the abscissa axis, represented an indicator of the growth speed of the dynamic process represented by the yield in relation with the allotted N and PK doses. The slope related to the PK = 0 up to PK = 150 levels, displayed a growing trend ($m_{2013-2015} = 11.4-23.4$; $m_{2013} = 11.2-27.73$; $m_{2014} = 9.8-24.8$; $m_{2015} = 13.1-19.1$), as the four sets of data analyzed strengthen the level of trust in a well-known principle of physiology and nutrition of plants - the synergic effect of nutrition factors.

Class no.

3

RO.98.

Title EN

Morphology characterization of a plowed land through fractal analysis

Authors

FLORIN SALA, MIHAI VALENTIN HERBEI, CIPRIAN RUJESCU

Institution

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description
EN**

The present research project aimed to evaluate the micro-morphology of a plowed land surface by fractal analysis based on aerial images taken at different heights. The images were collected in March and at the altitudes of 1m, 5m, 10m, 15m and 20m using a drone DJI Phantom 3. Fractal analysis was done using box-counting method. Between the fractal values and the height of image acquiring, interdependency relations have been identified in conditions of statistic certainty. These relations have been described by polynomial equations of 2nd degree in the case of fractal dimension D ($R^2 = 0.991$; $p = 0.009$), fractal dimension D_{BW} ($R^2 = 0.998$; $p = 0.002$), and of the fractal dimension D_{W+BW} ($R^2 = 0.984$; $p = 0.016$) and by a sigmoid function in the case of fractal dimension D_{B+BW} ($R^2 = 0.994$; $p < 0.001$). Fractal analysis facilitated the characterization of the studied area compared to the micro-morphology particularities of the plowed land

and the altitude of image acquiring, the cluster grouping of the fractal dimension based on Euclidean distances being performed in conditions of statistical certainty (Cophenetic coeff. = 0.843)

Class no.

3

RO.99.

Title EN

Management of *Hibiscus rosa siensis* L. propagation by optimizing the growth substrates and biostimulators combination

Authors

MARIA BĂLA, FLORIN SALA

Institution

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description
EN**

The aim of the research project was to evaluate the influence of biostimulators and growth substrates on rooting of cuttings, in order to improve the vegetative propagation through cuttings in *Hibiscus rosa sinensis* L.. Three varieties of *Hibiscus* (red flowers - R, yellow flowers - Y, and orange flowers - O), two growth biostimulators (Radistim - R, and Atonic - A) and four rooting substrates were used (sand - S1, sand:perlite - S2, sand:peat - S3, sand:peat: perlite - S4). From the combination of the three variables (biological material, biostimulators, and rooting substrates) resulted in 24 experimental variants. Cluster analysis facilitated for each studied hibiscus genotype obtaining a dendrogram in statistical safety conditions. In the case of the red hibiscus variety, there was a high affinity between R.S2.R (LSD0.5%) and R.S4.A (LSD5%), and between R.S3.R (LSD5%) and R.S3.A (LSD5%) variants, under conditions of Coph.corr = 0.899. In the case of the yellow hibiscus variety, a high affinity was found between Y.S4.R (LSD5%) and Y.S4.A (0.1%), and between Y.S2.R (LSD0.5%) and Y.S2.A (LSD5%) variants, in conditions of Coph.corr = 0.809. In the case of the orange hibiscus variety, there was a high affinity between O.S4.R (LSD0.5%) and O.S4.A (0.5%), respectively between O.S2.R and O.S2.A (LSD0.5%) variants, under conditions of Coph.corr = 0.859. By PCA analysis, PC1 explained 76.122% of variance and PC2 explained 23.878% of variance, and was obtained a distribution chart and a breakdown of variants in relation to the quality indices of the rooting process.

Class no.

3

RO.100.	
Title EN	USING GIS TECHNOLOGY IN PROCESSING AND ANALYZING SATELLITE IMAGES
Authors	MIHAI HERBEI, FLORIN SALA
Institution	Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara
Description EN	The purpose of this research is the analysis and classification of the land from National Park Cheile Nerei Beusnita, Romania, based on satellite images and GIS. Analysis and classification of the land corresponding to the reference area was based on satellite images LANDSAT 8. Processing and analysis of the images was performed using ArcGIS software, by means of two algorithms, ISO Data and K Means, with a variation in the number of iterations in order to evaluate the precision of the analysis process. In order to characterize the reference area we used 2 combination of spectral bands RED-GREEN-BLUE and NIR-RED-GREEN
Class no.	3
RO.101.	
Title EN	CHARACTERIZATION OF THE ARBOREAL VEGETATION FROM DENDROLOGICAL PARK BAZOȘ, ROMANIA, BASED ON SATELLITE IMAGES
Authors	MIHAI HERBEI, FLORIN SALA
Institution	Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara
Description EN	The purpose of this research is to create a spectral analysis of arboreal vegetation in Dendrological Park Bazoș, Romania. The survey is based on Landsat 8 satellite images, over a period of 258 days including inactive and active growing time periods. From the analysis of satellite images we obtained the spectral bands based on which the vegetation indices NDVI, NDBR and NDMI were calculated. The indices recorded minimum values during the inactive vegetation periods and they had an ascending distribution in the early stages of active vegetation, over the course of March and April.
Class no.	3

RO.102.**Title EN****Fractal characterisation of the cork cambium in *Fraxinus angustifolia* Vahl. depending on image caption distance****Authors**

ALMA L. NICOLIN, COSMIN ALIN POPESCU, CIPRIAN I. RUJESCU, MIHAI V. HERBEI, FLORIN SALA

Institution

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara

**Description
EN**

This research project aimed at characterising and analysing the geometry of bark in the species *Fraxinus angustifolia* Vahl. (ash) through fractal analysis. Binarised images of the ash bark captured from a caption distance between 10 and 50 cm every 5 cm were analysed through box-counting. Depending on the pixels analysed (black and white – BW, black + black and white – B+BW, and white + black and white – W+BW) we obtained fractal dimensions D_{BW} , D_{B+BW} , and D_{W+BW} , respectively. There was a high positive correlation between fractal dimensions and image caption distance: $r = 0.895$ for D_{BW} , $r = 0.787$ for D_{B+BW} , and $r = 0.820$ for D_{W+BW} , respectively. The relationship of interdependence between fractal dimensions and image caption distance was described by second degree polynomial equations with statistic safety, as follows: $R^2 = 0.882$, $p = 0.00165$, $F = 22.371$ for D_{BW} , $R^2 = 0.918$, $p = 0.00055$, $F = 33.498$ for D_{B+BW} , and $R^2 = 0.932$, $p = 0.00031$, $F = 41.292$ for D_{W+BW} , respectively.

Class no.

3

RO.103.**Title EN****ANTIMICROBIAL APPLICATIONS OF *Linaria vulgaris* L. EXTRACTS IN THE MEDICAL AND COSMETIC FIELD****Authors**

Borozan Aurica Breica, Popescu Sorina, Dumbrava Delia, Botau Dorica, Moldovan Camelia, Bordean Despina, Popa Mirela, Miscă Corina

Institution

Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Romania

**Description
EN**

The species chosen for this study is *Linaria vulgaris* L. which has a composition rich in polyphenols, terpenes, alkaloids, organic acids, mineral salts, sugars, pectins etc. with beneficial, unexplored effects. It has anti-acne, emollient, anti-inflammatory, depurative, cleansing urinary properties etc. and is recommended for internal and external use. It grows in a diversified habitat, from the lowland areas to the mountains,

being considered a weed. It can be easily harvested from unpolluted areas without additional costs.

The main objective was the antimicrobial screening of the extracts of *Linaria vulgaris* L. and the establishment of the extracts with possibilities for use in the medical and cosmetic field.

Although phytotherapy only recommends flowers, we microbiologically analyzed alcoholic extracts from all parts of the plants of *Linaria vulgaris* L, namely roots, stems, leaves and flowers in comparison with solvent and antibiotics. Microorganisms that produce internal and external (cutaneous) diseases have been selected for testing. The bacteria most affected by the linaria alcohol extracts were *E. coli* and *S. epidermidis*. Molecular analyzes have shown that short-term treatment with linaria extract products does not induce resistance in *Staphylococcus epidermidis* cells.

Besides the flower extracts, good antimicrobial effect also had the extracts from the stems.

Class no.

3

RO.104.

Title EN

Antimicrobial properties of the essential oils obtained from medicinal species belonging to the Lamiaceae family

Authors

Gabriela Valentina Ciobotaru², Dorica Botău, Ilinca M. Imbrea¹, Cristina A. Dehelean, Zinuca I. Pavel², Georgeta Pop¹

Institution

1. Banat's University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara
2. Victor Babeş University of Medicine and Pharmacy, 2 Eftimie Murgu Square, Timisoara, Romania

Description EN

The purpose of this study is to determine the antimicrobial activity of volatile oils obtained from species of the *Lamiaceae* family. To achieve this goal, the following objectives were set: cultivation of microbial strains in cultured plaques, evaluation of diameters of inhibition zones obtained after application of essential oils, use of gentamicin and fluconazole as reference substances, determination of minimum inhibitory concentrations after application of essential oils, determination of concentration bactericidal minima after application of essential oils.

Class no.

3

University of Agricultural Sciences and Veterinary Medicine "Ion Ionescu de la Brad" Iași

RO.105.

Title EN Fermented beverage from blackberries

Authors Taran Madalina Elena

Institution Universitatea de Stiintie Agricole si Medicina Veterinara

Patent -

Description

EN

The product has been designed taking into account the requirements of our current eating habits and harnessing the potential in terms of superior capitalization of berries which currently is recovered in the rough without bringing added value to a percentage of the national economy.

Works of obtaining the product or held in Alba Iulia The results show the special qualities of the fermented beverage of blackberries, both in terms of antioxidant capacity and in the high content of polyphenols. This drink can be classified in traditional groups for traditional products.

Class no.

3



„Nicolae Bălcescu” Land Forces Academy Sibiu, Romania

RO.106.

Title EN

Electric generator with adapted magneto and heat source obtained from exhaust gases

Authors

Jerlăianu Marian

Institution

“Nicolae Bălcescu” Land Forces Academy Sibiu

Description of the research.

The efficiency of the thermal engines has determined the development of a technological product meant to produce heat and electricity. Its organology is based on a metal chassis on which the heat engine and the generator with tensioner have been attached. The rotation is achieved by means of a trapezoidal belt that moves on two tightener pulleys.

The construction of the generator is simple; it has a central shaft on which two bearings are fixed; at one end there is a pulley fixed on the wedge and a screw screwed on the shaft. At the other end of the shaft, fixed by a taper screw, is the rotor with permanent magnets.

Description EN

The engine represents a complex structure that can transform the thermal energy from combustion into mechanical energy. The valorization of the calorific capacity resulting from the combustion process is achieved by means of an installation that is attached directly to the evacuation of the cylinder.

Field of application

The innovative technological product has a good and important use in the military environment. It can be used under bivouac conditions and at low temperatures. It can be used for lighting or for charging various batteries of energy storage devices. At the same time, the heating system based on the exhaust gases can be inserted into a confined space,

RO.107.**Title EN****MB-UGV-1****Authors**

Murar Bogdan Ionut

Institution*„Nicolae Bălcescu” Land Forces Academy SIBIU***Description of the MB-UGV-1**

The MB-UGV-1 (Murar Bogdan, Unmanned Ground Vehicle, version 1) is an unmanned robot, with the purpose of special missions. It allows checking high risk areas in theatres of operations from a safe distance. It also detects possible threats, without endangering the personnel.

The robot is equipped with a suspension system in order to maintain the precision of the arm, as well as a system for stretching the track. The tracks give the robot flexibility in its movement. Each track has a drive wheel located to the back, a tension wheel to the front and 3 wheels on the bottom, in order to make the contact of the track with the ground. Each track consists of 67 skates.

The hull is made of 3mm thick plastic plywood, and component parts such as the turret, the tracks, the suspension system and the wheels were designed using the SolidWorks software, saved with the .stl extension, and then printed with a 3D printer with PLA filament, 1.75mm thick.

**Description
EN**

The MB-UGV-1 is built using the developed Raspberry Pi 4 board, 3 Nema 17 Stepper engines, 3 DRV8825 drivers for motor control, a camcorder, a Velleman KSR10 robotic arm, 2 L298N drivers and an Arduino Nano development board.

The main circuit is controlled via the Raspberry Pi 4 board. Two Stepper motors are used to move the robot, being connected to the Raspberry via the DRV8825 drivers. The third engine, Nema 17, is used for turret rotation. The rotation system of the turret uses gear wheels. Thus, the gear module is 2.25 and the pressure angle is 14.5.

The robot's turret is meant to amplify the range of the Velleman's arm. The robotic arm is located on the turret, which has the 4 motors connected to the Raspberry Pi 4 board via the L298N drivers for remote manipulation.

Petroleum-Gas University of Ploiești

RO.108.	
Title EN	Method and security system for civil airports protection against terrorist attacks with portable ground-to-air missiles
Authors	Octavian Narcis IONESCU, Emil PRICOP, Gabriela Cristina IONESCU
Institution	Petroleum-Gas University of Ploiesti, Romania
Patent no.	<p>RO 129740 B1</p> <p>The invention relates to a system for protecting the civil airports against terrorist attacks with portable soil-air missiles and to a method for its implementation in the existing missiles. The proposed system consists of an electronic rocket launch locking device mounted on the launch tube and an identification device installed on the missile. Each device has a unique code stored in the internal memory that cannot be altered. System operation is based on emitting the declared lost equipment codes and checking the coincidence between the received codes and the ones stored in the memory of launch device. In case of code correspondence, the launcher automatically locks up.</p>
Description EN	
Class no.	8; 10; 12
RO.109.	
Title EN	<i>Process for separation of disulfides from used caustic soda from MEROX installation</i>
Authors	Florin Oprea, Elena-Mirela Fendu, Marilena Nicolae, Victor Vlad
Institution	Petroleum-Gas University of Ploiești
Patent no.	<p>RO130690/30.10.2018</p> <p>The patent discloses a process for removal of disulfides from caustic solutions resulting from the elimination of mercaptans in the mercaptan oxidation process. The process is carried out in two contacting steps, each consisting of a static mixer or centrifugal mixer (centrifugal pump) and a horizontal separator vessel. The extraction solvent, used in the same ratio in both steps, consists in a fraction of hydro treated gasoline.</p>
Description EN	
Class no.	1

Vasile Alecsandri University of Bacau

RO.110.	
Title EN	Process for preparing asymmetrical polymeric membranes with permanent wettability to be used in water ultrafiltration for pharmaceutical and food industry
Authors	NEDEFF Valentin, SANDU Andrei Victor, NEDEFF Florin Marian, SANDU Ioan Gabriel, BARSAN Narcis, TĂTARU Laurențiu, SANDU Ion
Institution	Vasile Alecsandri University of Bacau
Patent no.	Pending RO133608 (A0) — 2019-09-30
Description EN	The invention relates to a process for preparing asymmetrical polymeric membranes with permanent wettability to be used in water ultrafiltration for pharmaceutical and food industry. According to the invention, the process consists in dispersing 0.3% mixture of silica nanoparticles and colloidal silver, in a gravimetric ratio of 98:2 in a hydrophilic polymeric solvent, such as 1-methyl-2-pyrrolidone, followed by adding 30% polysulphone dispersed in polymeric solvent, while stirring, the stirring being continued for 24 h at 240 rpm, at the ambient temperature, to result in a stable homogeneous dispersion which is cast on an unwoven textile carrier made of yarns of less than 100 μ m, to result in polymeric membranes having a thickness of 100...200 μ m and a pore diameter asymmetrical stratigraphic profile.
Class no.	3

Politehnica University of Timișoara

RO.111.	
Title EN	W SUPER ABSORBING AIR FILTER
Authors	Corneliu Birtok Băneasă
Institution	UNIVERSITATEA POLITEHNICA TIMIȘOARA
Patent no.	Patent application – US 14/121674; The technical problem that the air filter W solves for internal combustion engines according to the invention, is to increase the volume of filtered air available to supply the internal combustion engine. 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.
Description EN	
Class no.	8. Aviation, car industry and transportation
RO.112.	
Title EN	CYLINDRICAL MULTI-HOLLOW BRIQUETTE PRODUCED OF FERROUS PULVEROUS WASTE
Authors	HEPUȚ TEODOR, CRIȘAN EUGEN, ARDELEAN ERIKA, SOCALICI ANA, ARDELEAN MARIUS
Institution	Universitatea Politehnica Timișoara
Patent no.	Patent No. 127756 / 30.08.2019 The invention relates to a cylindrical multi-hollow briquette obtained from ferrous pulverous and small waste with a grain size of less than 2 mm, said briquette being used in ferrous metallurgy in the wind furnaces producing the refining iron or in the installations for direct reduction of iron in order to produce iron sponge. The multi-hollow cylindrical shape of the lighter ensures the growth of the reaction surfaces, respectively of the speed of reduction of iron oxides, compared to conventional lighters, with positive effects on productivity, energy consumption and on the degree of usage of the reductant.
Description EN	
Class no.	6. Mechanical Engineering - Metallurgy
RO.113.	
Title EN	Analysis of the fluid dynamic behaviour through the air collector following the installation of pressure outlets.
Authors	Robert Bucevschi, Ana Socalici, Adina Budiul Berghian, Corneliu Birtok Băneasă

Institution **Universitatea Politehnica Timișoara**
Patent no. PhD thesis

Description On the intake route of internal combustion engines there are
EN two categories of losses: gas-dynamic and thermal. In order
to increase the fresh air flow, each element of the intake
must be analyzed from this perspective. This study is based
on the results of CFD simulations and aims to analyze the
influence of two pressure sockets mounted on the inner
surface of the air filter inlet diffuser.

Class no. 8. Aviation, car industry and transportation

RO.114.

Title EN **DRIFT super-aspirating air filter**
Authors Corneliu Birtok Băneasă
Institution **Universitatea Politehnica Timișoara**
Patent no. 125034

Description DRIFT or multifunctional super-aspirated air filters are
EN dedicate for Drift competition cars. These reduce the
thermal, the gas and dynamic losses by contributing to the
increase of the filling degree of the motor cylinders. In
addition to the main air filtration task, the DRIFT super-
aspirating air filters perform the following functions:

- captures air;
- increase the speed of suction air flow;
- prairie the air.

Class no. 8. Aviation, car industry and transportation

RO.115.

Title EN **Educational program DEXTER'S laboratory**
Authors Corneliu Birtok Băneasă
Institution **Universitatea Politehnica Timișoara**
Patent no. **Educational program**

Description Creative projects, teaching materials, experimental stands for
EN 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.116.

Title EN **CP4 experimental stand - "DEXTER" Laboratory**
Authors Corneliu Birtok Băneasă, Tudor Dinu Ioniță, Adina Budiul Berghian
Institution **Universitatea Politehnica Timișoara**
Patent no. License project
 The experimental stand CP4 is intended for the maintenance and repair in laboratory conditions of the injection pumps CP4, respectively to determine the degree of wear of the component elements: the drive shaft; injection pistons; injection cylinders; follower etc. The CP4 stand is designed and realized with the support of the CorneliuGroup Association research-innovation through the educational program "DEXTER" Laboratory.
Description EN
Class no. 8. Aviation, car industry and transportation

RO.117.

Title EN **Engine cylinder head experimental stand - "DEXTER" Laboratory**
Authors Adina Budiul Berghian, Robert Popa, Corneliu Birtok Băneasă
Institution **Universitatea Politehnica Timișoara**
Patent no. License project
 Engine cylinder head experimental stand is intended for the maintenance and repair in laboratory conditions of the cylinder heads, respectively to establish the degree of wear of the component elements: valves; guides; valve seats; tappets; knobs etc. The engine cylinder head experimental stand is designed and realized with the support of the CorneliuGroup Association research-innovation through the educational program "DEXTER" Laboratory.
Description EN
Class no. 8. Aviation, car industry and transportation

RO.118.

Title EN **Air by Corneliu – Weekend inventions**
Authors Corneliu Birtok Băneasă
Institution **Universitatea Politehnica Timișoara**
 Health & Care Project
 Weekend Inventions - Air by Corneliu are innovative creative concepts for a wide range of consumers and aim to increase the quality of life by using environmentally friendly products.
Description EN

- MicroU, an ecological and multifunctional alternative to glasses pouch, with a protective and cleaning function, without resorting to wet napkins;
- BircoR is a soap support made of natural materials (stone) of different shapes and sizes. BircoR: reduces stress, improves dexterity, brings us closer to nature;
- The soap AIR by CORNELIU an explosion of imagination, originality, inventiveness, colors, harmony, fragrances and shapes. The soap includes a wide range of essential oils, antioxidants, bee products, vitamins, natural pigments without SLS/SLES.

Class no.

RO.119.

Title EN

RoboFIH Team

Authors

Ovidiu Gelu Tirian

Institution

Universitatea Politehnica Timișoara

Patent no.

**Description
EN**

RoboFIH - The robotics team of the Faculty of Engineering Hunedoara. The main purpose of the team is for the study and construction of autonomous robots (light trackers, obstacles detection sensors, etc.) and flexible production lines under laboratory conditions.

Class no.

5. Industrial and laboratory equipments

RO.120.

Title EN

Power Steering - "DEXTER" Laboratory

Authors

Amalia Dascăl, Corneliu Birtok Băneasă

Institution

Universitatea Politehnica Timișoara

Patent no.

License project

**Description
EN**

Experimental stand intended for the study in laboratory conditions of the respective steering system of the electric power steering module within the cars. The stand is designed and realized with the support of the CorneliuGroup Association research-innovation through the educational program "DEXTER" Laboratory.

Class no.

8. Aviation, car industry and transportation

RO.121.**Title EN****Double table flywheel clutch and hydrotransformer - "DEXTER" Laboratory****Authors**

Camelia Pinca Bretotean, Stanciu Andrei Marius, Corneliu Birtok Băneasă

Institution**Universitatea Politehnica Timișoara****Patent no.**

License project

**Description
EN**

Teaching stand for the study in laboratory conditions of the clutch with double flywheel and the hydrotransformer four internal combustion engine. The stand is designed and realized with the support of the CorneliuGroup Association research-innovation through the educational program "DEXTER" Laboratory.

Class no.

8. Aviation, car industry and transportation

RO.122.**Title EN****SeptoBirCor****Authors**

Corneliu Birtok Băneasă

Institution**Universitatea Politehnica Timișoara****Patent no.**

Health & Care Project

**Description
EN**

SeptoBirCor hand sanitizer based on natural ingredients (alcohol, bee products, antiseptic oils). SeptoBirCor has a dual effect: the hands are disinfected and at the same time are hydrated, eliminating side effects such as dehydration, irritation and cracks in the skin. The SeptoBirCor is an environmentally friendly product from the range of Weekend Inventions under the brand Air by Corneliu, with the aim to increase the quality of life.

Class no.

4. Medicine - Health Care - Cosmetics

RO.123.**Title EN****LPG fueling system for the car - "DEXTER" Laboratory****Authors**

Sorin Aurel Rațiu, Corneliu Birtok Băneasă

Institution**Universitatea Politehnica Timișoara****Patent no.**

License project

**Description
EN**

Teaching stand for the laboratory study of the LPG gas fueling plant of internal combustion engines. The stand is designed and realized with the support of the CorneliuGroup Association research-innovation through the educational program "DEXTER" Laboratory.

Class no.

8. Aviation, car industry and transportation

RO.124.**Title EN**

The attempt to traction of the insulation of the cable lay-ups from cars

Authors

Teodor VASIU, Adina BUDIUL BERGHIAN, Corneliu BIRTOK BANEASA

Institution

Universitatea Politehnica Timișoara

Patent no.

-

**Description
EN**

The correct operation of the cars is the result of correctness output of the execution and the fitting ensembles, building blocks and the marks components. After make, each among these are submissive of a specific testing which have the fate to confers them a certainty of good operation in exploitation. The cable lay-ups, as components of the electric plant, are submissive of attempts which visa the workstations and the insulation. In this work are analyzed the insulations of a cable lay-ups. The results, obtained abaft their attempts to traction, are processed with specialized software Weibull+ + 7, who permits the determination of reliability parameters of the cable lay-ups and therewith we can do appreciations about material quality used to the manufacture of the coatings and the correctness they were made.

Class no.

8. Aviation, car industry and transportation

RO.125.**Title EN**

Electronic time relay with all the usual functions

Authors

Popa Gabriel Nicolae, Popa Iosif, Deaconu Sorin Ioan

Institution

Universitatea Politehnica Timișoara

Patent no.

RO 129042

**Description
EN**

The electronic time relay with all the usual functions performs, depending on the position of some setting switches, the delay of the attraction or the release or the retention in the attracted state for a certain time or the delay of the attraction or the release of the electromagnetic relay's mobile armature, the electronic relay having three AND-NOR gate performing with the setting switches, an electronic switch, through which the control is transmitted from an external electrical contact to the electromagnetic relay, the delays being realized by means of two time electronic circuits made of resistors, capacitors and diodes.

Class no.

5. Industrial and laboratory equipments

RO.126.**Title EN** **Mechanical calliper****Authors** Nekula Fridrich, Popa Gabriel Nicolae, Popa Iosif**Institution** **Universitatea Politehnica Timișoara****Patent no.** RO 130441**Description
EN**

The patent relates to a mechanical calliper with slider, with the possibility of digital display, intended mainly for measuring the large outer diameters. The shaft, according to the invention, is composed of a fixed part, provided with a scale formed by a linear area and a non-linear area, on the fixed part being mounted, by means of a beam perpendicular to the fixed part, two outer arms and from a movable part on which an outer arm is fitted, provided with a linear scale and with a locking screw.

Class no. 5. Industrial and laboratory equipments**RO.127.****Title EN** **DC linear voltage-sinusoidal signal variable frequency converter****Authors** Popa Gabriel Nicolae, Popa Iosif, Deaconu Sorin Ioan**Institution** **Universitatea Politehnica Timișoara****Patent no.** 2013 00795**Description
EN**

The DC linear voltage-sinusoidal signal variable frequency converter provides a periodic sinusoidal signal at the output that depends on the DC voltages applied on two inputs: a DC voltage is applied to one of the inputs, which linearly modifies the frequency of the output signal, and on the other of the inputs applies a DC voltage which linearly changes the amplitude of the signal from the output of the converter. The DC linear voltage-sinusoidal signal variable frequency converter comprises seven functional blocks: two analog multiplication circuits, two analog difference circuits, one non-inverting amplifier and two integration circuits.

Class no. 5. Industrial and laboratory equipments

RO.128.

Title EN **Device for measuring the large inner or outer diameters**
Authors Popa Gabriel Nicolae, Diniş Corina Maria, Popa Iosif
Institution **Universitatea Politehnica Timișoara**
Patent no. 2015 00543

**Description
EN**

The device for measuring parts of large inner or outer diameters is formed by a rectangular metal frame, four metal arms having the same height, a comparator, which can be mechanical or with digital display, with the non-linear scale dial (for the mechanical comparator), from a movable rod with a ball contact piece at the end. The non-linear scale has two areas: for measuring the inside diameters (concave surfaces) and for measuring the outside diameters (convex surfaces). The comparator is mounted in the center of the rectangle (at the intersection of the diagonals) of the support of the measuring device.

Class no.

5. Industrial and laboratory equipments

RO.129.

Title EN **Novel modular stack design for high PREssure PEM water elecTrolyzer tEchnoLoGy with wide operation range and reduced cost PRETZEL**

Authors

German Aerospace Center, Stuttgart, Germany
 Westphalian University of Applied Sciences, Gelsenkirchen, Germany
 Armines, France
 Politehnica University Timisoara, Romania
 Adamant Composites Ltd., Greece
 GKN Sinter Metals Filters GmbH, Germany
 Centre for Research and Technology Hellas, Thessaloniki, Greece
 Soluciones Catalíticas IBERCAT S. L., Madrid, Spain
 iGas energy GmbH, Germany

Institution**Patent no.**

Universitatea Politehnica Timișoara
 WO2014040746A1

**Description
EN**

The overall objective of PRETZEL project is to develop a new polymer electrolyte membrane electrolyzer (PEMEL) based on the novel principle of hydraulic compression. To achieve this goal, innovative components that can operate at high

temperature and current density are manufactured. Finally the stack with the new components will be integrated into a high pressure PEMEL test facility to validate the overall performance and operational criteria. PRETZEL consortium will develop a 25 kW water electrolysis system, with a production capacity of 4.5 m³ H₂ / h at rated power, at a pressure of 100 bar and water temperature of 90°C.

Class no. 2. Energy and sustainable development

RO.130.

METHOD FOR TREATMENT OF MUNICIPAL SOLID WASTE INCINERATION RESIDUES BY STABILIZATION/SOLIDIFICATION INTO FLY ASH ROCK

Title EN

Authors

Reinhold WÄCHTER, Ioana IONEL, Adina NEGREA

Institution

Universitatea Politehnica Timișoara

Patent no.

RO131486A0

**Description
EN**

The patent focuses on inertization of municipal solid waste incineration residues, through stabilization into ash rock matrix resulted from coal power plants. The method is used to encapsulate harmful chemical compounds by absorption, hydration or precipitation reactions, using a binder matrix. The aim of the process is to create new compounds, in a stabilized form, which retain the harmful elements that are non-hazardous or less hazardous than the raw (initial) material.

Class no.

7. Buildings and Materials

"Lucian Blaga" University of Sibiu**RO.131.****Title EN****Individual personal electrical car****Authors****ȚÎȚU Aurel - Mihail, OPREAN Constantin, MĂRGINEAN Ioan, ȚÎȚU Ștefan, MOLDOVAN Alexandru, BOGORIN-PREDESCU Adrian****Institution****"Lucian Blaga" University of Sibiu****Patent no.****Patent application A 2015 00552****Description
EN**

The invention relates to a car intended for economic and non-polluting travel in the city in cases where it is necessary to move only his own person. The car is composed of a compact body in the form of a half-ovoid sectioned along the length, at the elliptical chassis being symmetrically arranged four wheels at the ends of an imaginary rhombus oriented so that the maximum diagonal coincides with the direction of travel

Class no.**8****RO.132.****Title EN****Decontamination reactor of aflatoxin M in milk****Authors****KETNEY Otto, ȚÎȚU Aurel - Mihail****Institution****"Lucian Blaga" University of Sibiu****Patent no.****Patent 130818 - 28.02.2020****Description
EN**

Many dairy products may contain several compounds that have a toxic effect on human health, among these substances there are also listed as aflatoxin M. The invention is characterized in that it has the advantage of reducing aflatoxin M from milk in continuous flow to large volumes of milk, can be applied at industrial level and guarantees food safety.

Class no.**3**

RO.133.

Title EN Plastic parts in the automotive industry
Authors ARION Delia Aurelia Cristina, HAȘEGANU Elena Maria
Institution "Lucian Blaga" University of Sibiu
Patent no. -

Description EN Injection molding has been one of the most popular ways for fabricating plastic parts. They are used in automotive parts, housewares, medical equipment, compact discs. This performance is due to notable qualities: they are anticorrosive, electro-insulating, good mechanical properties, low cost, pleasant external appearance, they can be processed both by traditional mechanical means and by injection technology, can be covered with paint or by galvanizing, which allows each executed product to achieve the desired look by the designer. We have chosen 2 components of the armrest system from the first generation of VW-TUAREG 2001 vehicles and the molding for them.

RO.134.

Title EN Device for checking and interpreting the geometrical condition of radial stroke
Authors BUICĂ Marin - Cristian, MARIN George Adrian
Institution "Lucian Blaga" University of Sibiu
Patent no.

Description EN The research and innovation project presented was carried out within ULBS, the engineering faculty, the laboratory Tehnological Devices. The research carried out is based on the constructive and functional design of a control device that measures the radial beat of some functional diameters (functional dimensions) for the reference "crankshaft" within a car. The control device is made of a base plate with threaded holes, two short prisms, a side plate and a special support chosen to support the comparator clock. The rotation of the crankshaft oriented with the help of the two prisms and of a pin fixed in the side plate will be done manually.

RO.135.

Title EN Device for PVC processing and fluidization
Authors BUICĂ Marin - Cristian, BUNEA Dumitru, MARIN George Adrian
Institution "Lucian Blaga" University of Sibiu

Patent no.

The proposed research and innovation project refers to a device designed to transform plastic waste into granules of different sizes and then to melt them in order to create a "plastic filament" type material that is necessary for later use in specific printer technologies. 3D. The diameter of the "plastic filament" obtained can be variable, as desired, with the possibility of adjustment by changing some elements specific to the device. The device for processing and fluidizing the PVC was realized within ULBS, the Faculty of Engineering, the Laboratory "Device design" in order to use it in the form of a prototype, in order to be further refined.

**Description
EN****RO.136.****Title EN** 3D Printer**Authors** BUNEA Dumitru**Institution** "Lucian Blaga" University of Sibiu**Patent no.****Description
EN**

The invention (3D Printer) is intended to copy or create 3D prototypes of an extremely complex piece or toy of a plastic material such as PLA (Polylactic Acid), ABS (Styrene Butadiene Acrylonitrile) or newer photopolymerizing resin. A 3D printer is a limited type of industrial robot, which is capable of creating 3D models of parts under computer control.

RO.137.**Title EN** Improving the quality of an industrial fabrication process**Authors** BUNESCU Daniel**Institution** "Lucian Blaga" University of Sibiu**Patent no.****Description
EN**

The research aimed for improving the quality of a technological process of manufacturing a flange that was recently launched in production at S.C. COMPA S.A. Sibiu, a company with a long tradition in the production and development of automotive components. The main purpose of the research was to reduce the internal scrap rate, which was realised by using statistical process control, calculation of process capability index and gage R&R analysis. The main defects and their source were identified using these quality management methods. The measures taken reduced the scrap rate in only three months with 16,32%.

RO.138.

Title EN Statistical data processing from measuring
Authors COSTEIU Emilia-Stefania, MITOI Roxana-Emanuela
Institution "Lucian Blaga" University of Sibiu
Patent no.

Description
EN

Learning some notions about: first types of statistical processing performed on a sample of values from experimental measurings or from aquisition operations of datas, areas of applicability of the respective processing, algorithms and the ways of working. Applying statistical tests presented in the study on a sample of values and draw conclusions. In situations that follows value determination of a sample from a certain process when we want to eliminate or reducing effects caused by various types of errors, experimental values obtained are submitted on some tests that evaluates influential induced by error generators factors of measuring.

Class no.**RO.139.**

Title EN Waterjet cutting
Authors DAVID Mario – Ioan
Institution "Lucian Blaga" University of Sibiu
Patent no.

Description
EN

Water jet cutting is an ideal alternative for milling or traditional cutting techniques. The advantages of water jet cutting are: Flexible production, efficient production of unique parts, no thermal effects or stresses, is a precise and productive technology, there is no thermal load, even hard and rigid materials can be cut, environmental protection , during cutting does not pollute the environment. Materials that can be processed by this process are: Aluminum, stainless / acid-resistant materials, steel, rubber, sealing materials, stones. The most important parameters of this technology are the pressure and the quantity of water.

RO.140.

Title EN The accuracy of the analysis of a measuring system within a tolerance laboratory and dimensional control
Authors MITOI Roxana-Emanuela, COSTEIU Emilia-Stefania
Institution "Lucian Blaga" University of Sibiu

Patent no.

The quality of a product will depend on a complex of sizes including geometrical parameters, linear and angular, are basic factors, which in machine constructions they are granted a particular attention both in technical design and in the technological one. The execution of a sample to an exact rigorous size it is hard to obtain. On the other hand, the practice shows that a sample could fulfill its functional role in good conditions and if the dimension of this is executed in certain limits. For example, if we consider a sample with a reaming in which should rotate a certain spindle, ensemble of the two samples works approximate as well for a closer scope of values for a reaming

**Description
EN****RO.141.****Title EN**

3D printing with biodegradable materials

Authors

HICIU Sebastian – Traian

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

3D printing it is a training process of a solid three-dimensional object of any shape, made by an additive process, where successive layers of material are established in different forms. 3D printing it is, also, distinct from the traditional processing techniques, which is mainly based on removal of materials such as cutting or drilling. Main biodegradable materials used in 3D printing are: ABS – Acrylonitrile butadiene styrene; PLA – Polylactic acid; PET – Terephthalate polyethylene; PC – Polycarbonate. These types of materials have different printing temperatures, each material has advantages and disadvantages. From the respective materials a variety of printed products can be obtained.

RO.142.**Title EN**

Design and construction of a 4x4 truck

Authors

LANGA Mihai

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

The research and innovation project aims at research and development of a 4x4 truck based on vehicles produced by Tatra, Volat, Oshkosh, LiaZ, MAN and Kamaz, being capable to carry a load up to 10 tons and reaching a speed of

110kmph. The truck will have a high mobility level and can travel on any type of terrain, including rough terrain. The first part refers to characteristics of existing trucks and a parametrized and simulated CAD model according to the aspects investigated, so the second part is the presentation of a model based on it, which fulfills all applications of model.

RO.143.**Title EN**

Design of a new type of hydraulic double-sided shock absorber

Authors

LIMBĂȘAN Laurențiu Vasile

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

The research project refers to a new type of hydraulic double-sided shock absorber manufactured at thyssenkrupp Bilstein SA Sibiu and its improvement by mitigating some disadvantages such as: the reduced potential for compression adjustment at the external adjustment system and the reduction of the number of uncontrolled leaks compared to the monotubular system.

RO.144.**Title EN**

Laboratory stand used for drilling and milling operations

Authors

MĂTUȘA Ionuț Alexandru

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

The research project refers to a new type of hydraulic double-sided shock absorber manufactured at thyssenkrupp Bilstein SA Sibiu and its improvement by mitigating some disadvantages such as: the reduced potential for compression adjustment at the external adjustment system and the reduction of the number of uncontrolled leaks compared to the monotubular system.

RO.145.**Title EN**

Method of automatic control of axial radial bearings

Authors

POPA Constantin-Denis

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

The purpose of the research is to reduce the times in which the bearing control is performed on an automatic technological line. With the reduction of verification times, a

reduction of the consumed resources is realized, therefore, implicitly of the production cost. In a first phase, a check of the efficiency of all the elements of the line will be carried out in order to establish the components that will be kept and the elements that will be replaced / optimized. In the second phase, the cycle times will be recalculated, depending on the specifications of the new components and the times of the remaining components will be optimized.

RO.146.**Title EN**

Studies replacement thermochemical treatments of type Tenifer

Authors

POPESCU Luciana, Sebastian MĂRĂSCU

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description**

EN

The research includes, among others, general information related to the thermal treatments and at the same time thermochemical, a classification of them, but also the most used processes of heating and cooling of the thermochemical treatments. We will analyze the TENIFER type heat treatments, the nitriding process and the temperature variation depending on the thickness of the layer. Finally, a pragmatic analysis of the possibilities of replacing TENIFER-type thermochemical treatments will be performed

RO.147.**Title EN**

The research study of the design of a passive bitubular shock absorber used in the automotive industry

Authors

ȘCHIOPU Eduard-Florin, HERCIU Andrei - Ioan

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description**

EN

The special feature of the two-tube damper is the existing one of the tank, or as it is called: the clearing chamber. At the compression stroke, the rod is inserted into the working cylinder, thus displacing a volume of oil equal to the portion of the rod that enters the cylinder. This surplus is pushed through valves in the clearing chamber, the space between the inner cylinder and the reservoir tube. In the upper part of the compensation chamber is pressurized gas (approx. 6 bar), which is used to prevent the occurrence of oil circulation noises.

RO.148.**Title EN**

Improvement of the technological parameters in the processing by electrical erosion

Authors

URSACHI Bogdan Grațian

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

The research project presents a very current practical study regarding the optimization of the process of processing by electrical erosion with massive electrode for different types of metallic materials. The experiments were carried out in an industrial organization in Sibiu where there is a real interest in using the process of dimensional processing by electric erosion both classical and magnetic activation. The research is based on an experimental program based on all the methodologies of an experimental research. The resulting conclusions are drawn from a concrete experimental study given that the metal materials processed are the ones used in the chosen industrial organization to carry out the research.

RO.149.**Title EN**

Prototyping

Authors

TUREAN Alexandru

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

Prototyping is a process of building a model or a draft version of an idea. It is a method of product designing that is used in various applications in mechanical engineering. It is also a stage where preliminary changes and product fixes occur before fabrication happens. Engineers and prototyping specialists seek to understand the limitations of prototypes to exactly simulate the characteristics of their intended design. It is important to realize that by their very definition, prototypes will represent some compromise from the final production design. Due to differences in materials, processes and design fidelity, it is possible that a prototype may fail to perform acceptably whereas the production design may have been sound. A counter-intuitive idea is that prototypes may actually perform acceptably whereas the production design may be flawed since prototyping materials and processes may occasionally outperform their production counterparts.

RO.150.**Title EN**

Clamping device for milling the water evacuation channels on brake discs

Authors

BUICAN George

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

The device is used to clamp and orientate brake discs to aid the milling of shallow channels on the active surfaces, channels used to eliminate water during difficult operation conditions. It is composed of a base plate, orienting elements, clamping elements (screw and lever action device) and a system that allows the rotation and angular spacing of the milling process, in order to ensure the correct placement of said channels so that the specifications are met. After the machining the clamping and indexing system can be retracted to enable the finished product to be removed and a new one to be placed so that the process can be continued. The device allows for easy handling of the clamping components, without the need of tool usage, the operation being facilitated by the telescopic handle, which can be retracted and remains so during milling thanks to a built in magnet.

RO.151.**Title EN**

Contributions concerning the use of smartphone applications in higher engineer education

Authors

DANCIU Vasile-Andrei

Institution

"Lucian Blaga" University of Sibiu

Patent no.**Description
EN**

In this scientific research project, we tried to look for a way to integrate modern methods and smartphones into the higher engineering education. Throughout the project we studied the smartphone application market, trying to figure out what already exists, but especially what could be improved or even innovated. The research resulted in an application integrated into a course. The main purpose of the paper was to find or modularize an application that could help us with education.

RO.152.

Title EN Clamping device for drilling processing
Authors MESAROȘ Adriana, DANCU Florin Radu
Institution "Lucian Blaga" University of Sibiu
Patent no.

Description
EN

The student research project presented refers to the clamping of component which have the C120 material, which is used in the automotive industry. The clamping device for drilling it must ensure well-determined position to the direction of certain movements, in the case of machining on machine tools. This device is the constructive and functional technical system that must ensure the orientation and fixation of the semi-finished product.

National Research&Development Institute for Chemistry and Petrochemistry - ICECHIM Bucharest

RO.153.

Title **Phonoabsorbant structure from polyurethane wastes**

Authors Rodica – Mariana Ion, Laurentiu Marin, Nelu Ion

Institution ICECHIM, Bucharest

Patent no. **A 2020-00057/07.02.2020**

The invention relates to a stratified type structure and its process for obtaining it. According to the invention, the structure consists of gypsum panels between which an anti-breakage element such as fiberglass mesh bonded together with a polyurethane binder and a sound-absorbing layer made up of mills of polyurethane foam having the particle size of 7 ... 10 mm and polyurethane binder in 50:50 gravimetric proportion, used in civil or industrial constructions, Fig.1. The process of obtaining the sound-absorbing structure according to the invention consists in bonding the plates with fiberglass nets, preparing and depositing the mixture of polyurethane foam milling polymeric binder between the plates and drying the structure.

Class

7

RO.154.

Title **Recycling process of non-metallic wastes of printed circuit board and recovered polypropylene as shock-resistant composites**

Authors Paul Niculae Ghioca, Ramona-Marina Grigorescu, Lorena Iancu, Rodica Mariana Ion, Nelu Ion, Mădălina-Elena David, Elena Ramona Andrei, Mircea Ioan Filipescu, Bogdan Norocel Spurcaci

Institution ICECHIM, Bucharest

Patent no. A2020 -0080/17.02.2020

The invention describes a process for simultaneous recycling of non-metallic fraction of waste printed circuit boards and of recovered polypropylene as impact-strength composites. The recycling of these polymers is a stringent requirement both for the protection of the environment and for reducing the use of fossil materials. Extraction and processing of these fossil resources are costly and polluting. Polypropylene is one of the most used polymers and its industry was highly developed. It is known that most of polypropylene sorts have a low impact-strength, property that becomes even more

NATIONAL

deficient for the recovered polymer due to the degradation of the products during their exploitation. The process according to the invention removes this disadvantage by melt modifying the recovered polypropylene together with the non-metallic fraction of printed circuit boards and with a mixture of two styrene-butadiene block-copolymers. Thus, polypropylene composites with similar impact strength with the assortments available on the market, but cheaper are obtained by an ecological method. Another advantage of the invention is the use of a powder from printed circuit boards waste with a size of 0.2 ... 0.8 mm, whose less advanced milling is achieved with reduced energy consumption. The polypropylene composites obtained according to the invention can be used in the production of technical parts and packages.

Class

1

RO.155.

Title

Alginate microcapsules with encapsulated magnetite for photocatalytic degradation of anti-tumoral drugs

Authors

Ana –Alexandra Sorescu, Alexandrina Nuță, Rodica Mariana Ion, Nelu Ion

Institution

ICECHIM, Bucharest

Patent

A2020-00029/23.01.2020

The present invention relates to a process for obtaining magnetite nanoparticles for use in the retention / destruction of antitumor drugs present in wastewater.

Description

According to the invention, the process of obtaining involves two steps, as follows: the extraction of phytocomponents from vegetal-source as non-toxic resources, followed by the contact with the precursors of Fe^{3+} and Fe^{2+} at a pH appropriate to obtain the iron-ferric oxide, isolation and drying.

Class

1

RO.156.

Title

Elastomeric films for the degradation of anti-tumor drug wastes in photocatalytic reactors

Authors

Rodica Mariana Ion, Paul Niculae Ghioca, Ramona-Marina Grigorescu, Lorena Iancu, Madalina -Elena David, Nelu Ion

Institution

ICECHIM, Bucharest

Patent

A2020-00030/23.01.2020

Description

The invention provides an elastomeric film used for the

degradation of anti-tumor drug waste in photocatalytic reactors (Fig.1) and the process for obtaining it. The elastomeric film according to the invention comprises particles up to 200nm of titanium dioxide 2-6% relative to the mass of the elastomer, which is dispersed in block styrene-butadiene copolymer with stellate structure and with 32% polystyrene and molecular weight of 196,000 g / mol - SBS, with a resistance to thermo-oxidative degradation of the styrene-butadiene block copolymer up to 60°C.

Class

1

RO.157.

Title

Natural fungicidal composition for combating grapevine downy mildew and method of obtaining it

Authors

Irina Fierascu¹, Radu Claudiu Fierascu¹, Toma Fistos¹, Liliana Cristina Soare², Camelia Ungureanu³, Diana Vizitiu⁴

Institution

¹National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest/
²University of Pitesti/ ³University Politehnica of Bucharest/ ⁴The National Research and Development Institute for Biotechnologies in Horticulture Stefanesti

Patent

A00073/2020

Description

The present invention relates to an ecological composition for combating pathogenic strains that affect grapevines (*Plasmopara viticola* (Berk. & MA Curtis) Berl. & De Toni, (1888), responsible for the grapevine downy mildew), based on phytosynthesized silver nanoparticles using alcoholic extracts of *Dryopteris filix-mas* (L.) Schott rhizomes. This environmentally friendly composition for combating pathogenic strains that affect crop uses non-toxic solvents, has no adverse reactions, is cheap, and has no adverse effect on the environment and human health, and has the property of direct application in culture without requirement of other chemicals as transport vectors. 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.

Application: Materials, nanotechnology, environment protection

Class

3

RO.158.

Title	Antimicrobial coating and with protective role for the natural stone surfaces with cultural value and method of obtaining it
Authors	Radu Claudiu Fierascu ¹ , Irina Fierascu ¹ , Roxana-Ioana Brazdis ¹ , Anda Maria Baroi ¹ , Alina Ortan ²
Institution	¹ National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest/ ² University of Agronomic Sciences and Veterinary Medicine of Bucharest (USAMVB)
Patent	A00072/2020
Description	The present invention relates to a coating material with antimicrobial and protective properties, for natural stone objects (limestone or magmatic rocks) with cultural value, and not only, based on an antimicrobial component (consisting of a hydroxyapatite derivative) in a solution of organosiloxane oligomers (at different concentrations). The solution uses compounds whose synthesis is fast, economical, and without negative action on the environment and human health under normal conditions of use, having an antimicrobial component easily to synthesize. In addition, the influence on the treated objects is insignificant from an aesthetic point of view. 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.
Class	14

RO.159.

Title	Adsorbent with magnetic properties based on apatitic material for treatment of impurified waters with organic and inorganic compounds and method of obtaining it
Authors	Radu Claudiu FIERASCU, Irina FIERASCU, Valentin RADITOIU
Institution	The National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent	A00380/2019
Description	Multiple sources pollute the environment, such as the textile industry, mining activities, the use of pesticide, liquid waste discharges, etc. Inorganic and organic pollutants present in water can cause dysfunctions of the circulatory system; they

can alter the DNA structure etc. The present invention relates to an adsorbent material composed of an active phase (apatitic material) and a magnetic phase, for the adsorption of organic and inorganic pollutants present in aqueous media, at ambient temperature and atmospheric pressure. This work was supported by Romanian Ministry of Research and Innovation MCI through INCDCP ICECHIM Bucharest 2019-2022 Core Program PN. 19.23 - Chem-Ergent, 2018 Project No.19.23.03.01.

Application: Materials, nanotechnology, environment protection

Class 1, 12

RO.160.

Title **Antimicrobial pulverisable solution for restoration / conservation of leather supports and method of obtaining it**

Authors Radu Claudiu Fierascu¹, Irina Fierascu¹, Roxana-Ioana Brazdis¹, Anda Maria Baroi¹, Alexandru Stirban², Ariana Codruta Leahu², Alina Ortan³

Institution ¹National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest/
²National Museum of Union Alba Iulia (MNUAI)/
³University of Agronomic Sciences and Veterinary Medicine of Bucharest (USAMVB)

Patent A00074/2020

Description The present invention relates to an antimicrobial pulverisable solution based on a mixture of hydroxyapatite, calcium oxalate and zinc apatite (composed from a hydroxyapatite derivative in which calcium has been completely dissociated from zinc), used for conservation/ restoration of heritage objects. on leather support. The solution uses compounds whose synthesis is fast, economical, and without negative action on the environment and human health under normal conditions of use, having an antimicrobial component easily to synthesize and nontoxic, and doesn't influence the treated objects from an aesthetic point of view. 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.

National Institute for Research and Development in Electrical Engineering ICPE-CA Bucharest

RO.161.

Title	Experimental model for testing the biomethane potential of biomass
Authors	Mateescu Carmen, Lipcinski Daniel, Lungulescu Eduard Marius, Tanase Nicolae, Török Liliana Paraschiva
Institution	National Institute for Research and Development in Electrical Engineering
Patent no.	Patent application No. A/00053/2018
Description	The invention relates to a demonstration experimental laboratory model for testing the biomethane potential of biomass, which integrates into a unitary system two anaerobic fermentation bioreactors operating in parallel in a mesophilic temperature regime, adaptable for thermophilic regime. Each bioreactor is equipped with an electric heating jacket, a biogas purification line and a purified biogas harvesting recipient, while allowing biogas production to be quantified by volumetric, manometric and chromatographic methods. Also, the model allows manual or automatic sampling of raw and purified biogas samples for laboratory analysis. Applications: lab-scale experimental research for developing waste-to-biogas projects.
Class	1, 2

RO.162.

Title	Recovery of thermal energy released during the braking process of a drilling rig belonging to a drilling plant for oil and natural gas wells
Authors	Dobre Adrian, Stoica Victor, Marin Marcel Dorian.
Institution	INCIE ICPE-CA
Patent no.	Patent application No. A00869/2017
Description	The invention relates to the recovery of the thermal energy released in the braking process of a drilling winch belonging to a drilling plant for oil and natural gas wells, with its use in auxiliary activities for example for heating the radiators in the barrels arranged according to the location plan, as well as ensuring the consumption of domestic hot water for the social group. At present, water is used as a cooling agent for three-phase

asynchronous electric motors of actuation, of disc brake, respectively of electromagnetic brake with turbulent currents for the period of time corresponding to the braking process. The disadvantage of the classic solution is that the thermal energy absorbed by the cooling water is lost, by dissipation in the environment.

The technical problem to be solved by the invention consists in the recovery of the thermal energy resulting from the cooling of the drilling rig equipment, with the help of a heat exchanger with the mantle and the bundle of pipes, with a single passage in the mantle and several bundles, respectively in counter current.

The recovery of the thermal energy released during the braking process of a drilling rig belonging to a drilling plant for oil and natural gas wells, according to the invention, is carried out in three stages: in the first stage the hot thermal agent at 74 ° C enters the mantle of the heat exchanger ; in the second stage the cold thermal agent enters the pipe bundle belonging to the heat exchanger; In the third stage the heat agent at 50 ° C enters the radiators and the reservoir of the social group.

Class

2

RO.163.**Title**

Small hydropower plant with two cross-flow counter rotating turbines

Authors

Nicolaie Sergiu, Mihăiescu Gheorghe Mihai, Bunea Florentina, Popescu Mihail, Chihaia Rareș-Andrei, Băbuțanu Corina Alice, Dumitru Constantin, Macamete Elena, Guțu Mihai, Ilie Cristinel Ioan, Fuiorea Ion

Institution

National Institute for R&D in Electrical Engineering ICPE-CA

Patent no.

Patent application No. A/00615 din 28.08.2018

Description

The invention relates to a small hydropower plant with two cross-flow counter rotating turbines, equipped with two turbines, with transverse flow, with the rotor blades facing each other, located in separate, lateral chambers of the housing. The turbines are mounted with an oblique entry, on both sides towards the water inlet direction, that the hinged construction elements of the housing divide into the two chambers, causing the turbines to operate separately. Due to the reverse orientation the two chambers, the adjusting

valves and the blades, the turbines rotate in opposite direction, respectively, counter-rotating.

Class

2

RO.164.

Title

Magnetostrictive motor.

Authors

Ignat Mircea, Alexandru Dalea

Institution

National Institute of Electrical Engineering Research-Advanced Researche

Patnet

A/00605/2017

Description

Short description of your invention. Invention presents a electromechanical rotative motor which is based on the magnetostrictive effect (when a magnetic field is applied to a magnetostrictive material is produced a modification of the dimensions). This motor include an magnetostrictive actuator which drives tangential an cilindrical rotor with a periodical movement .

Applications on the fine electromecanical drives. The main experimental parameters are: Speed ;30 rpm, Torque : 5 Ncm, Voltage domain ; 10Vdc- 150Vdv, Frequency; 50Hz-200Hz.

Class

5

RO.165.

Title

Magnetostriction Actuator System

Authors

Mircea Ignat

Institution

National Institute of Electrical Engineering Research-Advanced Researche

Patnet

Patent application No.A/01067/2017

Description

Short description of your invention. This invention includes a system of linear actuators based on magnetostriction effect (when a magnetic field is applied to a magnetostrictive material is produced a modification of the dimensions). The structure of this magnetostrictive has : a magnetostrictive core, a coil for magnetic field generation and a concentric permanent magnet. This system includes an actuator on each axes

Applications . On electromechanical drivers which necessity a very fine domain 1 micron-0,1 mm. Others parameters; Force domain ; 50 cN- 2 N, Voltage domain ; 20- 250 V, Frequency : 50 Hz- 1kHz.

Class

5

RO.166.

Title	Incremental displacement positioning system by means of two position securing/releasing piezoelectric systems with parallelogram mechanism
Authors	Ovezza Dragoș, Tănase Nicolae, Chiriță Ionel, Ilie Cristinel Ioan, Popa Marius, Lipcinski Daniel, Nedelcu Adrian
Institution	INC DIE ICPE-CA
Patnet	A/01066/2017
Description	<p>The positioning system is of “inchworm” type with an advance/retraction system and two clamping devices, driven by low voltage piezoelectric actuators. The clamping devices have compliant parallelogram mechanisms that allow for securing/releasing the current position. In order to compensate for the large mechanical play which is inherent to long travel guideways the compliant mechanisms also behave as mechanical displacement amplifiers. The advance system voltage can be varied in order to adjust the size of the step.</p> <p>The drive can be used as an ultra precise positioning system (less than 1 micrometer) when a long travel (hundreds of millimeters or more) is also required.</p>
Class	1. 5

RO.167.

Title	Obtaining procedure and description of the concerned multiferroic material
Authors	Jana PINTEA, Alina Dumitru
Institution	INC DIE ICPE-CA
Patnet	A/00487-2017
Description	<p>The invention refers to a multiferroic material based on $\text{BiFeO}_3 - \text{BaTiO}_3$ and its obtaining process for various applications in the field of physics and of multifunctional devices like: sensors, biosensors etc.</p> <p>This material has both magnetic and ferroelectric properties in the same phase.</p> <p>These properties are found in completely different materials in terms of properties. Thus a magnetic material can be both conductive and insulating, while a ferroelectric material can only be an insulating material.</p> <p>The procedure for obtaining this multiferroic material,</p>

according to our invention, needs to go through a series of steps. During the first step, the raw materials are dozed and homogenized in a humid environment obtained by using ethyl alcohol. The materials are kept inside of agate mills with agate balls for 16 hours. The fraction material: balls: alcohol is 1:1:1. The entire product is then dried at temperatures between 80 - 105°C, and briquetted under a pressure of 200 daN/cm². The briquets are presinterized at a temperature between 850...900°C. In the third phase, the briquettes are ground again and mixed with polivinilic alcohol of 5% concentration. The powder obtained is then pressed in the form of disc, sinterised at a temperatre comprised between 1050-1150°C for 2h leading to a material with the following characteristics: density of 6.4725...6,945 g/cm³; dielectric losses of: 0.002...1; Curie temperature: 350....500°C; dielectric permittivity: min. 200. (max 250 words)

Class Invention Classification 7

RO.168.

Title Isotropic sensor for determining the low frequency electromagnetic pollution
Authors Mihai Bădic, Cristian Morari
Institution National Institute for Research and Development in Electrical Engineering ICPE-CA
Patnet Patent application No. A/00995/2017

Description This invention refers to an isotropic sensor for determining electromagnetic pollution at low frequency by measuring the electrical (E) and magnetic (H) components of electromagnetic radiation related to electric energy transmission lines (50/60 Hz).
 The isotropic sensor is based on constructive solutions with inductor as magnetic (H) field sensor and capacitor as electric (E) field sensor correctly arranged in order to measure perpendicular \vec{E} and \vec{H} pairs, according to theory, without the need of integrating amplifiers (which makes it easier to calibrate). It is able to measure the electrical and magnetic components of electromagnetic radiation (the six vector sizes characteristic to electromagnetic radiation in Rayleigh/Fresnel area) in the frequency range 10 Hz – 10 kHz (preferentially at 50/60 Hz, which corresponds to areas

affected by transmission and distribution of electricity) with a sensibility better than 5 nT for magnetic field and of 1 V/m for electrical field, with the possibility of identifying the radiation sources due to the dependence of quantities – including the phase difference between E and H – on r (the distance from the perturbation source) shown by the equations of elementary electric dipole superimposed on the elementary magnetic dipole (elementary loop antenna).

Class

1

RO.169.**Title**

System for electromagnetic shielding of built enclosures in 100 kHz - 18 GHz frequency range

Authors

Mihai Bădic, Cristian Morari, Aristofan A. Teişanu

Institution

National Institute for R&D in Electrical Engineering ICPE-CA

Patnet

Patent application No. A/00145/2018

Description

The invention refers to a system for electromagnetic shielding in the 100 kHz - 18 GHz frequency range of already built enclosures, with applications in the industrial, medical, communications, information security and research-development fields. The electromagnetic shielding system in the 100 kHz - 18 GHz range of built enclosures uses a very lightweight modular structure (specific mass of 5.7 kg/m² for a structure with aluminum foil with 200 µm in thickness), easy to mount, resistant to moisture, with panels covered on both sides with metal foil, which allows the use almost entirely of the space of the enclosure where it is applied, without the need to modify the installations for supplying electricity, water or gas, ventilation systems, communication, or other installations, and without penetrating the wall of the shielded room for mounting filters; it ensures the shielding of the windows so as to benefit from the natural light, it ensures an electromagnetic shielding effectiveness (SE_{dB}) between 60 and 120 dB in the frequency range 100 kHz to 18 GHz.

Class

1

RO.170.**Title**

Obtaining Method of Carbon Nanoparticles Designed for Carbendazim Detection

Authors

Gabriela Hristea

Institution

INC DIE ICPE CA

Patnet

A/00560/2017

Description

Concern about the presence of pesticide residues in water, soil and food has led to the identification of new alternative methods capable of detecting trace levels of these compounds in a simple way. Progress in the dimensional control of nanoparticles, reactive surfaces and nanoparticle assembly mechanism will open real opportunities for the development of new detection solutions (sensors) as portable instrumentation of detection. Most applied processes used to obtain carbon nanoparticles used in detection systems consist in: electric arc discharge, laser ablation, plasma methods, chemical vapor deposition (CVD), super-growth CVD, sol-gel methods followed by pyrolytic treatments. The advantages of the method described by this invention relay on the following:

- does not require expensive equipment (as in the case of physical methods);
- the number of processing steps is reduced;
- the synthesis conditions do not involve high temperatures or pressures, no special installations are required, but only usual laboratory equipment;
- the size of the nanoparticles is controllable by controlling the parameters of the synthesis conditions;
- the size of obtained nanoparticles: 10-20 nm;
- homogeneous dispersions;
- carbon nanoparticles electrical conductivity : 0.1-1 Ω ;
- increased sensitivity of nanoparticles by functionalisation in detection of carbendazim; (real detection of carbendazim up to concentrations of 10 nM);
- the use of these particles allows the design of a sensitive interface so that the analyte of interest interacts with the sensitive surface;
- efficient translation of the recognition process (of carbendazim);
- development of electroactive labels adapted for electrochemical stripping techniques to generate an electrochemical signal.

Class

RO.171.

Title	Process for obtaining an insulating material for electrical machines
Authors	Gabriela Telipan, Traian Zaharescu, Mircea Ignat, Bogdan Varaticeanu, Mihaela Chefneux
Institution	NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN ELECTRICAL ENGINEERING ICPE-CA Bucharest, ICPE SA Institute of Electrotechnical Research
Patnet	Patent application No. 00559/2017 The invention relates to a process for obtaining an improved slot insulating material for electrical machine, the insulating material consists of a sheet with a thickness of 0.20 mm, of polyethylene terephthalate. The initial insulating material is impregnated by immersion for 24 hours in a mixture of impregnating varnish alkyd-epoxy-melamine + phenolic antioxidant pentaeritritol tetrakis (3-(3,5-dithert-butyl-4-hydroxyphenyl) propionate 0.5% + SiO ₂ nanoparticles 5%.
Description	The tests were performed on 2 electric machines M1 with untreated insulation and M2 with treated insulation - Figure 1. The tests were performed as follows: the electrical capacity between the windings was measured at the frequency of 1 kHz, the insulation resistance was measured at 1 minute and 10 minutes at an applied voltage of 500 Vcc.
Class	

National Institute for Research and Development in Environmental Protection - INCDPM

RO.172.

Title **INTEGRATED SYSTEM FOR THE PRODUCTION OF
RENEWABLE ENERGY IN COASTAL AND
MARITIME AREAS**

Authors Apostol Valentin Gheorghe, Poteraş George, Pop Horaţiu,
Déak György, Dobre Cătălina Georgiana, Sîrbu Cristina,
Tănase Elena-Beatrice, Raischi Natalia

Institution **National Institute for Research and Development in
Environmental Protection Bucharest
University Politehnica of Bucharest**

Patent no. Patent application No. A / 00656 / 2019

Description The invention relates to a platform that integrates technologies for the production of electric and thermal energy by exploiting several renewable sources: hydraulic, wind and solar. The platform is provided with three modules. The solar hot water preparation module (1) consists of a right longitudinal solar collector (1.1), a transverse solar collector (1.3), a left longitudinal solar collector (1.2) and a technological space (1.4). The cylindrical aerial module (2) captures both wind and solar energy, being constituted of a wind turbine (2.1) with a central vertical axis with eight rows of blades. The aerial module generators are provided with vertical slots (2.2) for the airflow concentration, which are adjustable through the system (2.3) being also a support for the photovoltaic cells used to capture the solar energy. The aerial module has also a photovoltaic solar panel with a conical shape (2.4). The cylindrical submersed module (3) captures the hydraulic energy. A coupling for multiplying and transmitting the rotational speed is provided at the intersection of the central vertical axis of the aerial module with the horizontal axis (3.1) of the submersed module which. The partially submersed module has the same diameter as the aerial module. 16 rectangular paddles are fixed on the horizontal axis, eight by each sides of the coupling. All the equipment is connected by a floating platform (4).

Class 2. Energy and sustainable development

RO.173.

Title **WIND TURBINE BLADES WITH GEOMETRY
INSPIRED BY THE BIOENGINEERING MODEL OF
THE THISTLE SEED**

Authors GEORGE POTERAŞ, DEÁK GYÖRGY, IONEL NEACŞU

Institution **National Institute for Research and Development in
Environmental Protection Bucharest**

Patent no. Patent application No. A / 2019 / 00765

Description The invention relates to a wind turbine equipped with blades based on a bioengineered model inspired by nature, namely the thistle seed (*Carduus nutans*). According to the invention, the wind turbine is provided with 8 blades arranged radially on 3 levels. The blades are fixed on a vertical axis and can be both intubated in a cylindrical turbine provided with slots and deflector or arranged radially and embedded in a sphere, with vertical or horizontal axis, the number of blades being variable in this case, from 8 to 16 blades, depending on the diameter of the sphere. The blades obtained by applying the bioengineering solution, imprint to the turbine axis an improved rotational motion compared to other blade geometries, regardless of the air flow speed. The highest increase (+ 88%) was achieved at low air flow speeds.

Class 2. Energy and sustainable development

RO.174.

Title	IN-SITE EXPERIMENTAL STAND FOR PHYSICAL MODELLING FOR THE DETERMINATION OF THE HYDRODYNAMIC AND HYDROMORPHOLOGICAL PARAMETERS OF A RIVER / WATER COURSE
Authors	Ing. Deak Gyorgy PhD Habil., Raischi Marius, Matei Monica, Lumânariu Lucian, Cornățeanu Gabriel, Silion Mădălin, Gheorghe Petrache Ionuț, Boboc Mădălina, Olteanu Marius, Badea Gabriel, Cristea Alexandru
Institution	National Institute for Research and Development in Environmental Protection – INCDPM Bucharest
Patent no.	A/00130/2020
Description	<p>The invention entitled „In-Site Experimental Stand For Physical Modelling For The Determination Of The Hydrodynamic And Hydromorphological Parameters Of A River / Water Course” represents an unique method at national and international level, based on the development of physical models, using the natural hydrological conditions of a branch of the Danube, in order to determine the hydrodynamic parameters in the conditions of hydrotechnical constructions (submerged or unsubmerged) development. At the same time, the invention ensures the identification of hydromorphological changes on various river/water courses so that the impact of these changes on the environment can be evaluated, taking into account the effects of climate change. The advantage of this patent is that it provides the input, validation and control parameters for numerical simulations of the hydrological and hydrodynamic conditions, respectively the evaluation of the risks of interruption of the migration routes of the sturgeons tagged with ultrasonic emitters. The control of the input conditions of the hydrodynamic parameters in the physical model is ensured, respectively the determination on the assumed scale of other validation and control parameters based on the curve $Q = f(n)$ (m³/s), based on metadata collected on over 7 years, from the experimental area. Another advantage of applying the physical modelling method is that on a suitable scale can be determined the hydrodynamic parameters over a wide range of variation and can simulate the effects of climate change on the river course.</p>
Class	1

RO.175.

Title **Spongy composite material covered with zinc oxide with photocatalytic activity in the UV and VISIBLE spectrum, for environmental protection applications (SpongeMat/ZnO)**

Authors Burlacu Iasmina- Florina, Deák György, Marcu Ecaterina, Cimpoiu Cristina, Panait Ana- Maria

Institution **National Institute for Research and Development in Environmental Protection (INCDPM- Bucharest)**

Patent no. Patent Application No. A/2019/00386

Description The invention refers to a spongy support material covered with zinc oxide and the process of obtaining it, the obtained material has a high photocatalytic degradation capacity of the organic compounds from wastewater. The spongy support material is based on glass waste from fluorescent tubes, egg shells, Epsom salt fertilizer ($MgSO_4$) and it is coated with a layer of zinc oxide which gives it the photocatalytic properties.

Class

7

National Institute for Research-Development for Non-ferrous and Rare Metals – IMNR

RO.176.

Title	Cu-DOPED BST THIN FILMS DEPOSITION PROCESS BY RF-SPUTTERING METHOD
Authors	Arcadie SOBETKII ¹ , Mihai VIȘAN ¹ , Roxana Mioara PITICESCU ² , Cristina Florentina RUȘTI ² , Adrian Mihail MOTOC ² , Marcel IONICĂ ³ , Dumitru ULIERU ⁴ <i>¹MGM STAR CONSTRUCT S.R.L., Romania</i> <i>²National R&D Institute for Non-ferrous and Rare Metals – IMNR, Romania</i> <i>³IPA S.A., Romania</i> <i>⁴SITEX 45 S.R.L., Romania</i>
Institution	
Patent no.	Patent no. RO 131119 B1 / 30.07.2019
Description	The invention relates to a process for obtaining Cu-doped BST nanocrystalline thin films on commercial substrates which are used in the field of toxic gas sensors. The process uses sintered targets from doped BST powders, and the films are deposited using RF – Sputtering technique.
Class	1

RO.177.

Title	UNCONVENTIONAL RECOVERY PROCESS OF NON-FERROUS METALS FROM SLAGS
Authors	Felicia COSMULESCU ¹ , Florin DRAGOESCU ¹ , Daniela DUMITRESCU ² , Marian BURADA ² <i>¹S.C. COSFEL ACTUAL S.R.L., Romania</i> <i>²National R&D Institute for Non-ferrous and Rare Metals – IMNR, Romania</i>
Institution	
Patent no.	Patent application no. A/00697/2019
Description	The invention refers to a process of non-ferrous metals recovery from slags using direct microwave heating in the field of frequencies of 2000-3000 MHz and applied microwave power density of 15-3500 W/kg, in the presence of a reduction agent. The slags are used in the milled form, 1 μm-30 mm, correlated with the depth of microwave penetration as well as the slag composition. The process involves using a microwave melting furnace in which a

crucible made of microwave refractory ceramics is placed. By this process, nonferrous metals and alloys (Cu, Al, Zn and their alloys) were recovered with 30-60% efficiency, by melting slags mixed with salt fluxes.

Class 6, 1

RO.178.

Title **HIGH ENTROPY ALLOY FOR HIGH TEMPERATURE APPLICATIONS AND PROCESS THEREOF**

Authors Dumitru MITRICĂ, Mihai Tudor OLARU, Radu Robert PITICESCU, Marian BURADA, Gabriel ENACHE, Daniela Violeta DUMITRESCU, Beatrice Adriana ȘERBAN

Institution *National R&D Institute for Non-ferrous and Rare Metals – IMNR, Romania*

Patent no. Patent application no. A/00590/24.09.2019

Description The invention relates to an alloy with high entropy, resistant to high temperatures and a process for obtaining it. The new alloy is intended for the manufacture of parts that work under extreme conditions, at high temperatures. The thermal annealing treatment ensures the structural stability of the material. The material and process according to the invention have the following advantages: an alloy with high structural stability is obtained which confers superior mechanical properties at high temperatures and high resistance to oxidation; phase γ "specific to aeronautical alloys is more stabilized than in conventional alloys; processing of this alloy does not require complex thermo-mechanical treatments to obtain structures with maximum resistance to high temperatures; high operating temperatures with higher combustion yields can be achieved; engine blades made from this alloy will have a longer service life than conventional alloys, which reduces maintenance and replacement costs; the use of these alloys in practice reduces fuel consumption due to the high content of low density elements (Al, Zr).

Class

RO.179.**Title****CONCENTRATED COMPLEX ALLOY, OF LOW DENSITY, FOR EXPLOSION PROTECTION DEVICES****Authors**

Dumitru MITRICĂ, Ioana Cristina BĂNICA, Adrian CARAGEA, Gabriel ENACHE, Denisa VONICA

Institution*National R&D Institute for Nonferrous and Rare Metals – IMNR, Romania***Patent**

Patent application no. A/00815/28.11.2019

Description

The invention relates to a complex concentrated alloy, with low density and a process for obtaining it. The new alloy is intended for the manufacture of explosion protection devices for fuel tanks. The alloy and the process of obtaining according to the invention consists of: elaboration of the complex alloy 82-87% Al, 5-6% Cu, 0.8-1.2% Mg, 2.3-2.7% Si, 5.5 -6% Zn, in an induction furnace with a protective atmosphere (argon), at 800°C; pouring into the preheated molds at 250°C, with cooling in a controlled atmosphere at room temperature; mechanical processing to obtain material bars with a diameter of 1-2 cm, fast melt-spinning solidification at 1500 rpm and final processing of the obtained strips. The fast solidification process ensures a geometric configuration specific to the protective devices and a high structural stability of the material. The material and process according to the invention have the following advantages: the elements used to obtain the alloy are often used in practice; the high structural stability of the complex concentrated alloy confers superior mechanical properties at high temperatures and high corrosion resistance; the intermetallic phases evenly distributed in the material helps to obtain a high hardness without exhibiting fragility. The production of small ribbons is achieved through a relatively simple process

Class

12

RO.180.

Title	HIGH ENTROPY ALLOYS WITH PREDICTABLE MECHANICAL PROPERTIES BY COMPUTATIONAL MODELLING – HEAMODELL
Authors	Dumitru MITRICĂ ¹ , Radu Robert PITICESCU ¹ , Marcel SLUITER ² , Bojan PODGORNIK ³ , Borut ZUZEK ³ , Agnieszka GUSTIN ³ , Peter KLAVER ²
Institution	¹ <i>National R&D Institute for Nonferrous and Rare Metals – IMNR, Romania</i> ² <i>Technical University Delft, Netherlands</i> ³ <i>Institute of Metals and Technology, Slovenia</i>
Description	<p>High entropy alloys (HEA) are recently developed metallic materials, composed of five or more principal elements, which feature high mechanical and oxidation resistance properties at elevated temperatures. The complexity of HEA inherent to the large number of possible elemental combinations represents a serious challenge for industrial implementation. HEAMODELL project is proposing to establish new thermodynamic and kinetic criteria based on composition solidification-heat treatment structure correlations, making use of electronic, atomistic and macro-scale modelling techniques, coupled with a focused experimental and characterization approach. The integrated multiscale model for HEA design is validated at laboratory level including alloy synthesis/processing at pilot scale. Project results will contribute to the improvement of ICME predictive power for high temperature alloys for jet engines and to shorter time-to-market for innovative materials with high market impact.</p> <p><i>Project HEAMODELL is supported by M-ERA.NET (Horizon 2020 Programme), contract no. 75/14.06.2017.</i></p>

RO.181.

Title	INDIVIDUAL AND COLLECTIVE PROTECTION SYSTEMS FOR THE MILITARY FIELD BASED ON HIGH ENTROPY ALLOYS – HEAPROTECT
Authors	Dumitru MITRICĂ ¹ , Victor GEANTĂ ² , Ionelia VOICULESCU ² , Radu ȘTEFĂNOIU ² , Adrian ROTARIU ³ , Elena SCUTELNICU ⁴ , Dănuț SAVU ⁵
Institution	¹ <i>National R&D Institute for Nonferrous and Rare Metals – IMNR, Romania</i> ² <i>Politehnica University of Bucharest, Romania</i> ³ <i>Military Technical Academy, Romania</i> ⁴ <i>"Dunarea de Jos" University of Galați, Romania</i> ⁵ <i>University of Craiova, Romania</i>
Description	<p>The HEAPROTECT project aims to increase the research and technology transfer performance of R&D organisations in the field of obtaining of performing equipment from new and advanced materials, for the protection of military systems. The agenda comprises four sub-projects. First sub-project aims to develop high explosion-proof protection systems for fuel tanks, based on light high entropy alloys. Second sub-project aims to develop collective protection systems based on high entropy alloys from the AlCrFeMnNi system, microalloyed with Ti, Zr, Hf, Y. The third sub-project is planning to develop modern technologies for non-demountable assembly of components of individual or collective protection systems based on high entropy alloys. Forth sub-project aims to achieve high kinetic energy penetrators based on high entropy alloys, from high density chemical elements. Each project involves complex and multidisciplinary research activities and benefits from the significant contribution of human expertise and infrastructure on specific areas: the elaboration and processing of high entropy alloys, material weldability, military systems and complex systems construction.</p> <p><i>Project HEAPROTECT is supported by UEFISCDI (Programme P1 – Development of the National R&D System, PCCDI), contract no. PN-III-P1-1.2-PCCDI-2017-0875.</i></p>

National R&D Institute for Textiles and Leather INCDTP Bucuresti

RO.182.	
Title EN	Protective clothing for interventions in emergency situations
Authors	Toma Doina, Popescu Georgeta, Popescu Alina, Olaru Sabina, Salistean Adrian, Badea Ionela, Neagu Georgeta, Chiriac Iulia
Institution	INCDTP - National Research and Development Institute for Textile and Leather
Patent	<p>Patent application no. A00617/2018</p> <p>The invention refers to a system of protective clothing in the modular structure for protecting emergency responders against the multiple hazards, specific to the intervention missions. The system according to the invention consists of three layers (1,2 and 3) of different clothes, the first layer (1), worn in direct contact with the skin, is an underwear made up of blouse and pants, made of knitted fabric of 70% cotton fiber mixed with 30% regenerated cellulosic fibers with content of phase change materials with a mass of 220-250 g / m², the second layer (2), the base, is a duty uniform, a suit made up of blouse and trousers, made of woven fabric from a mixture of fibers including approximately 30-60% aramid fibers, 20-50% flame retardant cellulose fibers, 10-20% polyamide fibers, 2% antistatic fibers with a mass of 190-220 g / m² and the third layer (3) of protection, on the outside, is a protective suit for firefighters specific to the intervention missions.</p> <p>The protective clothing thus made has performances according to the specifications of the standards: EN 469: 2005/EN 469: 2005 / A1:2006) Protective clothing for firefighters. Performance requirements for protective clothing for firefighting and SR EN ISO 11612: 2015 - Protective clothing against heat and flames; providing: resistance to limited flame spread: the mean value of after-flame time: 0s; the mean value of after-glow time: 0s; water vapor resistance in stationary regime: below 30 m² Pa / W (level 2).</p>
Description EN	
Class	12

National Institute for Research Development and Testing in Electrical Engineering - ICMET Craiova

RO.183.**Title EN**

ADAPTIVE SYSTEM DESIGNED TO ENSURE
ELECTRIC POWER QUALITY IN LOW VOLTAGE
NETWORKS

Authors

Sacerdoțianu Dumitru, Nicola Marcel, Ivanov Sergiu, Ciontu
Marian, Chindriș Mircea Dorin, Cziker Andrei Cristinel,
Radu Alexandru, Dumitrescu Camil-Sorin.

Institution

National Institute for Research Development and Testing in
Electrical Engineering - ICMET Craiova

Patent

RO 132402

**Description
EN**

The adaptive system, according to the invention, consists of an active filter, connected in parallel with the electrical network and with the load and an active filter connected in series with the electrical network. The two active filters consist of two voltage source inverters, interconnected through a joint DC voltage circuit, a sinusoidal filter, 3 single-phase transformers, connected in series to the secondary network, 3 induction coils and 3 power resistors, connected to the same point as the load.

In order to ensure the necessary quantities, the system has a block for measuring the network voltage, a block for measuring the voltage at the output of the inverter serie, a block for measuring the voltage in the intermediate circuit, a block for load current measurement, a block for measuring the current at the output of the inverter sunt. The adaptive system is connected/disconnected to the secondary network by using three 3-phase contactors, a contactor performing the by pass function, a contactor for the pre-loading of the condensers in the DC voltage circuit and a high-pass filter. The system also contains two modules for the control of inverters.

APPLICATIONS

The adaptive system for electric power quality is used in low voltage networks as follows:

- It provides the compensation of the supply voltage distortion (harmonics, unbalance, slow and rapid fluctuations, etc.) and at the same time the compensation of currents distortion: harmonics and unbalance;
- It supplies the reactive power required by users;
- It provides the speed of response.

Class

2

RO.184.**Title EN**

MONITORING METHOD AND SYSTEM FOR THE SAG OF OVERHEAD POWER TRANSMISSION LINES CONDUCTORS

Authors

Sacerdoțianu Dumitru, Nicola Marcel, Vintila Adrian, Nicola Claudiu, Hurezeanu Iulian, Lazarescu Florica, Popescu Paul, Purcaru Ion, Albița Anca

Institution

National Institute for Research Development and Testing in Electrical Engineering - ICMET Craiova

Patent

Patent application No. : A/01090/12.12.2018

Description EN

The invention refers to a method and system for monitoring the sag of electrical conductors related to live overhead power transmission lines. This enables the continuous monitoring of the conductor's elongation due to varying environmental conditions, increased load, as well as its elongation in time, by means of a generally valid method for all types of cables used in electric power transmission.

The proposed invention provides a system for monitoring the sag of power cables, which is simplified, precise, easy to use, generally suitable for all types of cables, exclusively dependent on the conductor tilt.

The following advantages are obtained by applying the invention:

- The method is generally valid for all types of conductors, without introducing specific characteristics thereof;
- The system is simple and easy to achieve;
- The system uses quantities which can be measured with accuracy: the tilt of the conductor and the distance between the poles;
- It is a precise system;
- It detects the faults in their early stages, to prevent the serious failure of electric power transmission and distribution networks;
- A consistent database can be achieved, based on long-term data acquisition;
- The sag calculation relationships can be easily implemented;
- It provides increased efficiency of maintenance technologies;
- It provides the proper protection of the operating personnel and the environment.

APPLICATIONS

Monitoring the sag of the electrical conductors related to the overhead power lines and locating the overhead power line section with potential operating hazard.

Class

2

„Petru Poni” Institute of Macromolecular Chemistry

RO.185.
Title EN

The influence of diisocyanate structure on the crystallization of polyethylene glycol-based polyurethanes

Authors

Violeta Otilia Potolinca, Stefan Oprea

Institution

„Petru Poni” Institute of Macromolecular Chemistry

The aim of this work was to study the influence of the used diisocyanate structure on the thermal and crystallization behavior of new polyethylene glycol-based polyurethanes.

The polyurethanes have been prepared by a two-step solution polymerization procedure. The isocyanate end-capped prepolymer was obtained by reaction of polypropylene oxide with different diisocyanates (1,6-hexamethylene diisocyanate, 2,4-toluene diisocyanate and 4,4'-methylenebis(cyclohexyl isocyanate). The second step was the chain extension with polyethylene glycol. FT-IR and H-NMR spectroscopy was used for structure confirmation.

All polyurethanes have good thermal stability, but polyurethane with aromatic diisocyanate has the best properties (PTP).

**Description
EN**

As the flexibility of the PEG-chains plays a significant role in any crystallization process, we studied the crystallization-driven morphologies evolution of various PEG-based polyurethanes with different diisocyanates by differential scanning calorimetry (DSC) and polarized optical microscopy (POM) techniques.

Aromatic diisocyanate leads to better phase separation and also cold crystallization process was observed. Glass transition temperature was in the range $-56 \div -60$ °C. Sharp endothermic peaks were observed and were attributed to the melting temperature of PEG crystals (~ 40 °C).

From the POM images, large spherulites are evident when it is used aromatic diisocyanates (PTP) and only tiny structural features for the cycloaliphatic one (PHMP). In contrast, no large spherulites, but a homogeneous distribution of nano-crystals was observed for the aliphatic polyurethane (PHP). Spherulites are a morphological characteristic of crystallized polymers and are formed by a large number of chain-folded lamellar crystallites, radiating in all directions from a central nucleus with molecular chains oriented tangentially.

**National Institute for Research and Development in
Constructions, Urbanism and Sustainable Spatial
Development URBAN-INCERC, Bucharest, Romania**

RO.186.	
Title EN	Innovative concept for the integrated management of data flows within the National Network for Seismic Monitoring and Protection of Building Stock at NIRD URBAN-INCERC
Authors	Claudiu Sorin Dragomir, Iolanda-Gabriela Craifaleanu, Vasile Meişă, Emil Sever Georgescu, Daniela Dobre, Adelin Cişmelaru
Institution	National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development URBAN-INCERC
Description EN	<p>The National Network for the Seismic Monitoring and Protection of Building Stock at NIRD URBAN-INCERC performs several activities involving the recording, processing, analysis and interpretation of natural and human induced vibrations. Data coming from 62 permanent seismic stations, distributed all over the country, as well as data from temporary stations, is collected at the Network Data Center. This forms a huge amount of data, given that part of the stations is set for the continuous monitoring of seismic activity. Data comes in various formats, which requires using specific software applications for processing and analyzing it, as well as for unifying the display and presentation of results, for their coherent interpretation, reporting and dissemination. In addition, ensuring the functionality of the network involves permanent hardware and software maintenance, which is performed remotely, as well as by site inspections. The entire management of the network is based on a set of customized hierarchical procedures, that involve task distribution, data flow organization, equipment and software maintenance as well as logging and reporting of activities. The entire set of infrastructure management procedures have been created gradually by the members of the network team, during a work that extended over several years, in order to respond to the needs generated by the specific layout, configuration and functionality requirements of the network.</p>

RO.187.

Title EN	Dynamic modeling of vibro-compaction process on granular soils
Authors	Cornelia-Florentina Dobrescu
Institution	National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development "URBAN-INCERC"
Description EN	<p>The issue of dynamic compaction procedure using vibrations applied to granular soils is considered one of the most recent research topics in the stabilization technologies practice of mineral aggregates with clay. Therefore, the road structures and external platform of buildings with defined functions related to medium loadings can be performed by using mineral aggregates in admixture with clay particles as stabilization binder. Considering this technical framework, the vibro-compaction equipments require accessories and equipping special devices for adjusting the vibration regime in order to achieve parametric requirements of specific rheological modeling. The experimental results obtained in laboratory and in situ conditions reveal that the mixture prepared in optimized gravimetric doses by mineral aggregates (sand, gravel, and crushed stone) with clay can be schematized by Voigt-Klein or Maxwell rheological models. For this approach, the analysis of ground dynamic behavior using vibrating roller in correlation with the increase of compaction degree requires both a dedicated and specific studies to acquire a parametric optimization. The research is aimed to highlight the experimental data of several studies performed in the working plan of research projects, with useful conclusions to be considered by design and execution specialists in the field of road infrastructure.</p>

RO.188.

Title EN	Sound absorbing characteristics of some modern and recyclable materials with macromolecular compounds structure
Authors	Marta Cristina ZAHARIA , Ioana Mihaela ALEXE, Ciprian ENE
Institution	NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTION, URBAN PLANNING AND SUSTAINABLE SPATIAL

DEVELOPMENT „URBAN-INCERC”

In Romania, there were made researches and studies about the acoustic absorbing characteristics of some modern, ecological and recyclable materials and products, which can be used for construction and installation elements, and there were conducted during 2019-2020, in project PN 19 33.03.01, Phases 3 and 4, concluded with MEC.

The studies performed about a clasification of the types of modern materials and products that are environmentally friendly and recyclable, which can be used for building elements and installations in buildings with different destinations in urban areas.

Here are presented comparative studies, between the results of the acoustic characteristics of sound absorption obtained by testing: 1) a recycled product, uniquely designed within the project PN 19 33 03 01 Phase 3, obtained exclusively from recyclable materials respectively - Plastic bottles (PET) - (wrapped rolled), and 2) some modern materials made from: (a) polyethylene plates; (b) polyurethane foam boards, with flat surface; (c) two types of profiled polyurethane foam boards, with pyramidal profile. All this materials have some similar properties such as: a) the common chimal structure is based on macromolecular compounds, b) the density is low, apparent density is approx. $15...25 \text{ kg/m}^3$, c) samples thickness is between 30 to 65 mm.

Considering the results of the acoustic measurements, we can conclude that the recycled material has good acoustic absorption properties in the medium and high frequencies, which makes it advisable for the application as a new sound-absorbing material, very cheep, in rooms of different types of buildings, for example: industrial, schools, malls, open-offices, etc.

**Description
EN****RO.189.**

Title EN Innovative constructive solutions using by-products and traditional raw materials, suitable for prefabricated building elements

Authors Cristian PETCU, Vasilica VASILE

Institution National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN-INCERC”, INCERC Bucharest

Branch

In order to meet the new requirements of energy performance, the application of thermal insulation is quickly expanding in ordinary buildings, its thickness grows, substantially increasing the volume of thermal insulation materials used in buildings. If are used only synthetic products, over time, this approach could harm the environment. A paradigm shift is necessary, as using low-cost, low-energy natural materials is both environmentally friendly and, with an appropriate building design, can create high-efficiency building elements.

Description
EN

Applications. A series of constructive solutions, designed from the start with a focus on raw materials and by-products, are presented. A couple of materials, that pair well with this technology, were tested and results are given for finely chopped straws, coarse chopped straws, two types of sawdust, and a by-product consisting of fine shredded thin paper and cellulose, originating from the tobacco industry. In order to improve the adoption of these materials, we need adequate building designs, as exterior frame walls and hollow building elements filled with bulk insulation.

Advantages. Future buildings, using the presented concepts, would meet both the demand for superior insulation while integrating large amounts of by-products and storing the embedded carbon dioxide.

RO.190.
Title EN

Innovative, rustic and sustainable three-layered coatings

Authors

Irina Popa, Alexandrina Mureşanu

Institution

NIRD "URBAN-INCERC", INCERC Bucharest Branch

Description
EN

The paper presents aspects from an experimental research that aimed to design the first basic recipes of innovative products intended to be used in constructions, as coatings with vegetal additives. They had in their composition, embedded in a binder, vegetal waste from sunflower seed shells. The binder, a special acrylic paint applicable with stainless steel mortar board, was characterized, besides other specific aspects, by a good ability to evenly disperse this type of waste. Two dimensional categories (4mm and 6mm) of sunflower seed husks waste were used, resulting three innovative products. Each of them was applied, with a stainless steel mortar board, in three layers on cement mortar surfaces previously treated with a suitable

primer. The resulting three-layered systems (primer and two layers of the product with sunflower seed shells addition) have been studied as appearance, thickness, adhesion to the cement mortar surface and cohesion between layers. The analysis was carried out taking into account the quantity of addition, the maximum size and the number of dimensional fractions of the embedded waste. The advantages of manufacturing and using such coatings in constructions were highlighted, on the one hand as a new method of superior recovery of this vegetable waste, on the other hand, as rustic, innovative, sustainable coatings in a modern, circular economy.

RO.191.**Title EN**

Estimation of socio-economic costs resulting from air pollution in the indoor environment

Authors

Silviu LAMBRACHE

Institution

NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTION, URBAN PLANNING AND SUSTAINABLE SPATIAL DEVELOPMENT „URBAN-INCERC”

**Description
EN**

An evaluation of the socio-economic costs of indoor air pollution can help reveal pollutants, buildings, sources and situations that should be prioritized, thus facilitating the development of appropriate public policies.

From an economic perspective, indoor air pollution is a negative externality, (i.e., a consequence whereby no monetary compensation is initially planned for a transaction in which one party is affected by the intentional or unintentional behaviours of another). In this study, the socio-economic impacts of indoor air pollution are defined as the monetary value of the negative consequences of indoor air pollution, (i.e., quantity of resources lost by society as a result of pollution exposure). In this regard, there are two types of socio-economic costs of indoor air pollutants: external costs, which measure the opportunity costs of allocated resources resulting from the presence of indoor air pollution and impacts on public finances resulting from the presence of indoor air pollutants.

The results of the study are divided into two broad categories of indicators: estimate of the health impacts associated with exposure to each of the six target indoor air pollutants and

costs of indoor air pollution exposure for the target pollutants. The first indicator gives us specific data regarding associated health effect, number of years with the disease, average age at death, number of years of life and pension lost. The second indicator shows the total costs regarding indoor air pollution what it takes into account external costs (premature death, quality of life loss) and the costs of public financing.

RO.192.**Title EN**

EXPERIMENTAL RESEARCH ON THE BEHAVIOR OF THE SYSTEMS FOR VENTILATED FACADES, EXPOSED TO THE FIRE ACTION

Authors

Horațiu Dragne, Simion Adrian, Daniela Stoica

Institution

NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBANISM AND SUSTAINABLE SPATIAL DEVELOPMENT URBAN-INCERC

**Description
EN**

When establishing the constructive structures that must reach the required levels of fire performance, one must start from the fact that the fire is an accident. The structures must remain viable for the normal fire time considered. The behavior of the construction to the fire is dependent, besides other factors, on the contribution to the fire of the elements and parts of the construction, of the materials and products for the construction, as well as on the fire resistance of some of them. Due to the fact that the initiation and evolution of the fires is different, it was imposed that the determination of the fire behavior of the constructions and the materials that enter their composition should be done under different scenarios, by exposing them to a specified ignition source, in a good context. During the compartment fires, the ventilated façade systems of the buildings must have isolation behavior so as not to allow the fire to be transmitted vertically, from one floor to another of the building.

RO.193.**Title EN**

Urban environment influence on materials

Authors

Mihaela SANDU, Vasile MEIȚĂ, Gabriela CIULINARU

Institution

NIRD URBAN INCERC București

Description

Following the use and processing of primary resources

EN necessary to ensure human living conditions, several by-products result: gas, dust, liquid and solid products that are permanently discharged into nature. Some of these discharged products are reintegrated into the natural cycles of the environment, and others accumulate and cause ecological imbalances, in the sense of environmental pollution. The urban environment, which measures high levels of pollution, can influence the materials process of degradation and in fact results the Romanian heritage monuments degradation, which occurs at different levels and phenomena and thus involves different costs of rehabilitation and conservation.

The study highlights: cultural infrastructure projects realization that use new technologies, innovative and ecological building materials and which propose an original architecture; necessary improvements that can be made without affecting the cultural value of buildings; optimized costs in relation to economic impact.

RO.194.**Title EN**

Process for the realization and alkali-activated geopolymer binder, without cement

Authors

Adrian-Victor LĂZĂRESCU, Henriette SZILAGYI, Cornelia BAERĂ, Andreea-Cristina HEGYI, Vasile MEIȚĂ

Institution

NIRD URBAN-INCERC

Patent

Patent application No. A00500/2019

The invention refers to an alkali-activated geopolymer process and binder, without cement content, using as raw materials fly ash available in Romania and an alkaline activator based on sodium silicate (Na_2SiO_3) and sodium hydroxide (NaOH), intended for the construction of civil and industrial building elements.

**Description
EN**

The aim of this invention is to provide a complete solution and a user-friendly environment production of new alternative binders, with no negative impact on the environment. Fly ash, an industrial by-product, becomes the raw material in the design of the binder, thus preventing its conversion to waste. The innovation of this invention consists in harnessing local materials through the development of new alkali-activated binders and to optimize the specific design of the mixtures. The advantages of using geopolymer binders are the possibility of reintroducing into the economic circuit of fly ash, which is waste and contributing to the reduction of carbon emissions.

RO.195.**Title EN****Process for the realization and system for alkali-activated geopolymer pavements, paving slabs and road edges, without cement content****Authors**

Adrian-Victor LĂZĂRESCU, Henriette SZILAGYI, Cornelia BAERĂ, Andreea-Cristina HEGYI, Vasile MEIȚĂ

**Institution
Patent****NIRD URBAN-INCERC**

Patent application No. A00499/2019

**Description
EN**

The invention refers to a process for the realization and systems of paving blocks, slabs and road edges produced by using alkali-activated geopolymer concrete, without cement content, using as raw materials thermal power plant Class F fly ash available in Romania, an alkaline activator based on sodium silicate (Na_2SiO_3) and sodium hydroxide (NaOH) solutions for prefabricated paving elements for pedestrian use (pedestrian paths, pedestrian zones), bicycle lanes, parking lots, roads, motorways, industrial spaces (including docks and ports), aircraft runways, public transport stations, gas stations.

The aim of this invention is to provide, by using local materials in Romania, a complete solution and a user-friendly environment for the production of the alternative materials paving blocks, with no negative impact on the environment through the application of the circular economy concept. Fly ash, an industrial by-product, becomes the raw material in the design of the alkali-activated fly ash-based geopolymer concrete, thus preventing its conversion to waste.

The advantages of producing these types of prefabricated materials are the possibility of reintroducing into the economic circuit of fly ash, which is waste and contributing to the reduction of carbon emissions due to the fact that no Portland cement is used in their production.

Prefabricated paving elements made from alkali-activated, cement-free geopolymer concrete, gain strength faster than ordinary Portland cement concrete due to the heat treatment they are subjected to, and have comparable mechanical strength characteristics and lower density, which could also reduce storage, transport, handling and commissioning efforts.

RO.196.**Title EN****“Romanesque” Structures- Rehabilitation methods****Authors**

Anamaria BOCA, Tudor Panfil TOADER, Anamaria Cătălina MIRCEA

Institution**NIRD URBAN INCERC Cluj- Napoca Branch****Description
EN**

The first European architectural style well defined after the architecture of the Roman Empire is the Romanesque style and is a unitary whole, with no separation between its architecture and structure. In the sixteenth century, the notion of style in art appeared in the work of the Italian architect Giorgio Vasari entitled "Le Vite de 'più eccellenti pittori, scultori, ed architettori", published in 1550. The XI-XIII centuries are marked by the development of the art of Western European space where the architecture constituted the branch with the strongest definition and manifestation. Romanesque style or Romanesque art was defined as the ensemble of artistic evolution from the beginning of the Middle Age until the period of Gothic art. and is often found in the literature before the 19th century, under the name of Romano-Byzantine or Latin style.

In the transition period from early feudalism to the developed one XI- XII centuries, Romanesque architecture was formed and developed in the same period that the foundation of medieval cities and the centralized states in the Western Europe. The birthplace of the Romanesque style is France (Normandy and Provence) and northern Italy (Lombardy).

This paper presents the resources of engineering and architectural thinking in a conceptual research approach focused on the current and future demands of society.

The interventions on Romanesque style are based on biological, physical, mechanical, geotechnical studies on the bearing structures. The elaboration of a documentation which will include recommendations regarding the protection of Romanesque structural assemblies is the final aim.

RO.197.**Title EN****Research regarding self-cleaning capacity of cementitious composites with TiO₂ nanoparticles addition****Authors**

Elvira GREBENIȘAN, Andreea-Cristina HEGYI, Adrian-Victor LĂZĂRESCU

Institution**NIRD URBAN INCERC Cluj-Napoca Branch**

Currently, worldwide awareness has increased about the importance of building sustainability. The need to create a material with self-cleaning properties, used in urban areas to ensure a cleaner environment and reduce maintenance costs is considered one important step in achieving sustainable development.

The aim of this study is to demonstrate the influence that titanium dioxide (TiO₂) nanoparticles have on the self-cleaning ability of cementitious composites, in terms of staining with different agents (Rhodamine B 1g/l aqueous solutions, methylene blue 0,02 g/l solution and exhaustion gas 1 g/l solution), followed by UV rays exposure, artificial rain and drying and by afterwards determining the white degree of the samples.

Description
EN

Preliminary experimental results show that the white degree, respectively the cleaning degree of the samples, is strongly influenced by the concentration of the TiO₂ nanoparticles in the mixtures and the type of staining agent. The following conclusions were drawn:

- In order to achieve optimal results, the amount of TiO₂ nanoparticles was in the range 3-6% (relative to the amount of cement).
- A quantity of more than 6% TiO₂ nanoparticles reduced the self-cleaning performance of the cementitious matrix.
- The self-cleaning capacity was influenced by the intensity of activation in the presence of UV, the duration of exposure, as well as the molecular structure of the staining agent.

Producing self-cleaning cementitious composites with TiO₂ nanoparticles addition is important as a result of the interest in achieving sustainable, aesthetic constructions, with low maintenance costs, with improved and environmentally friendly performances.

RO.198.

Title EN

Evaluation of mineral local raw materials for the production of alkali-activated geopolymer binders

Authors

Brăduț Alexandru IONESCU, Adrian LĂZĂRESCU

Institution

NIRD URBAN INCERC Cluj-Napoca Branch

Description
EN

Rapid growth in population has led to the generation of large amounts of waste and environmental degradation. In order to protect the environment for future generations and to preserve

the already limited mineral resources, a sustainable solution for traditional Portland Cement Concrete is more than necessary. This can be achieved by producing geopolymer binders. The chemical composition of the geopolymer is similar to the natural zeolites, but with an amorphous microstructure.

In order to produce geopolymer binders, raw materials rich in aluminum and silicon are alkali-activated. Some of the raw materials, for the production of the geopolymer binders can be obtained from natural sources, such as kaolin, metakaolin (calcined kaolin), diatomite, volcanic rock, etc., or industrial waste arising from production processes, such as fly ash, iron slag, blast furnace, granulated blast furnace slag, silica fume, marble dust, etc. For the production of alkali-activated geopolymers, the most used activators are a combination of sodium hydroxide (NaOH) and sodium silicate (Na_2SiO_3) or a solution of potassium hydroxide (KOH) and potassium silicate (K_2SiO_3). Geopolymers show high compression resistance from an early age, low shrinkage, acid resistance, fire resistance, frost-thaw resistance and low thermal conductivity. The aim of this study is to present relevant data in the field and study the opportunities of using Romanian mineral local raw materials in order to produce alkali-activated geopolymer binders.

RO.199.
Title EN

A sustainable approach regarding the development of Engineered Composites Materials (ECCs)

Authors

Anamaria Cătălina MIRCEA, Tudor Panfil TOADER, Carmen DICO

Institution

NIRD URBAN-INCERC Cluj- Napoca Branch

**Description
EN**

Developing composite materials can be a reliable alternative, due to their performances like: durability, low weight, impact resistance, flexibility in design, high strength to weight ratio, resistance to corrosion and heat, toughness, good insulation properties, buildings sustainability can increase and the costs for maintenance decrease.

In the last years, Engineered Cementitious Composites became an alternative for classical materials due to their high performances and represent a unique group of ultra-high ductility materials that have incorporated short fibers that can be used in either new constructions or as repair retrofitting

materials, in infrastructure for bridges, roadway repairs or new types of sustainable buildings.

The aim of the research is to present results and to evaluate the overall mechanical performances and sustainability of ECCs.

The experimental program was structured in Mechanical tests (compressive strength and tensile strength at different ages or conditions) and the evaluation of the Self- Healing (SH) capacity. The SH phenomenon was evaluated microscopically before and after the exposure of the specimens to air-water cycles. For mechanical tests, the samples were kept in water for 28 days. Several sets of samples were tested at 28 days and others after 50 cycles of freeze-thaw.

Results show that due to the designed characteristics and performances, the material can be adjusted in accordance to the identified specific applications. Besides all this advantages, in order to produce ECCs with increased performances, materials considered wastes were incorporated in their matrix therefore, adding high value to the material, including environmental awareness.

RO.200.

Title EN	Special Concrete used to reduce pollution impact in transport infrastructure
Authors	Tudor Panfil TOADER, Anamaria Catalina MIRCEA, Carmen DICO
Institution	NIRD URBAN-INCERC Cluj-Napoca Branch Nowadays, the most appropriate material used for the developement of sustainable transport infrastructure is concrete. Its main characteristic is to provide protection against outside aggressive agents and also to take over the compression efforts developed in the element sections and conferring desired rigidity to structures.
Description EN	Under the action of aggressive factors in the environment and undergoing microcracking / cracking due to exploitation, reinforced concrete elements can lose their load-bearing capacity when reinforcement corrosion appears. Due to their behaviour in exploitation, infrastructures where concrete with self-healing properties is used, have an increased lifespan, implicitly leading to a decrease in maintenance and repair works that need to be overtaken. The amount of materials removed from the repair works could be drastically

reduced if such materials with increased performances are used.

Repair works, transport of materials, storage/recycling of waste resulting from construction materials, increase the cost for the life-cycle assesment of transport infrastructure and also has an impact on the environment.

Incorporating waste materials (recycled concrete - crushed from out-of-use structures, thermal power plant powders, marble powders and different other mineral/waste additions) in the mix-design of new sustainable concrete, removes a part of the negative impact that using large quantities of concrete has on the environment.

The current research contributes to the worldwide attention concerning environmental problems, by using concrete with self-healing properties, therefore creating materials with superior performances generating sustainable development.

RO.201.
Title EN**Self- healing Concrete****Authors**

Tudor Panfil TOADER, Anamaria Cătălina MIRCEA, Carmen DICO

Institution**NIRD URBAN-INCERC Cluj- Napoca Branch**

One of the most used materials in the construction field is concrete. The advantages that makes this material suitable for the development of sustainable infrastructures are high compression efforts, structure rigidity and reinforcement protection. A structural failure can be produced by the loss of load-bearing capacity of the reinforcement, if no intervention is taken on filling the access ways of aggressive external factors that are generating the cracking phenomenon of the concrete.

**Description
EN**

Due to the external agents like rain, fog, snow, that are also aggressive, the reinforment of the concrete elements is exposed. The access of external aggressive agents to the reinforcement is reduced by incorporating self-healing agents into the concrete which are acting on cracks/microcracks, by closing them.

At early stages, microcracks are hard to detect and manual intervention is required for periodic inspections and repairs.

Lowering the costs of maintenance and repairs and increaseing the life and exploitation of the infrastructure are the main advantages in choosing concrete with self-healing properties.

According to the literature, concrete Self-healing characteristics can be classified into two categories:

1. Self-healing concrete - when the hydration reaction produces self-healing of microcracks/cracks and,
2. Self-healing with the help of self-healing agents, that are embedded in the concrete mass.

Designing and using materials with self-healing properties, that are also called “smart materials” and can adapt to environmental conditions according to their properties, is a required necessity in order to improve and increase the life of the elements.

RO.202.
Title EN

Corporate governance related to research - development activities in Romania

Authors

Mircea-Iosif RUS

Institution

NIRD URBAN INCERC Cluj-Napoca Branch

**Description
EN**

Corporate Governance represents a set of “rules of the game” by which the companies are internally managed and supervised by the Board of Directors in order to have the interests of all the participating parties protected. Thus, this governance has as its specific the distribution of rights and responsibilities between the various participants in a company, like the board, shareholders and other participating parties and which specified the rules and the procedures involved in making the decisions related to the respective company business.

The necessity of this corporate governance appearance came up when many companies filed for bankruptcy, financial crises and, above all, the gap between the compensations granted to managers and the corporation performance of the last years, all this demonstrating that the introduction of the corporate governance was not just a manner of the company’s survival but, most important, a prosperity manner of the corporation.

In Romania the research-development activity develops both public and private.

The public research-development activity operates in research-development national institutes, universities, institutes subordinated to the Romanian Academy and private companies usually organized as joint stock companies.

The principles of the corporate governance should be implemented by all the entities of the research-development

activity because this means that there could be a total transparency related to the funds allocated by the state budget for the research-development.

RO.203.**Title EN**

Sustainable construction materials in an environment complying with the principles of tradition and innovation

Authors

Monica CHERECHEȘ, Adrian CIOBANU, Florina FILIP Aurelia BRADU, Marius MART, Daniel GHERGHEL, Ionel PUSCASU

Institution

National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development “URBAN-INCERC” Iasi Branch

**Description
EN**

The architectural typologies of Romania have registered a considerable improvement in the last years and this is due to the large-scale use of the advanced technologies meant to support architectural design and creativity. But among these, we must not forget about sustainability and energy efficiency.

Applications: The research aimed to develop thermal-insulation products *with vegetable fibers* which allow rehabilitation of existing buildings or new one at low cost, with natural and renewable materials, locally available with respect for the environment and the health of people. The thermal insulating materials can be applied directly as they are (sawdust, straw, hemp, etc) or treated with simple solutions of water with clay, lime or in combinations.

Given the increasing emphasis on the three dimensions of the sustainability of constructions, namely, the economic side (through the protection of limited resources), the ecological one (through the protection of the environment) and the socio-cultural one (through the care for the health of the users and ensuring an optimal degree of comfort), the study is subordinated to the current concerns of combining tradition with innovation in construction, as essential elements in the technological evolution.

Acknowledgments: This study was performed within the frame of the scientific project "Researches to achieve the acoustic and thermal comfort inside the buildings, using an innovative tool for choosing the optimal structures of construction elements, from classic versus modern materials", PN 19 33 03 01, Contract No. 24N/2019. The authors would like to

acknowledge the financial support provided by Ministry of Education and Research, Romania.

RO.204.

Title EN	Experimental devices for determining the thermal resistance for high performance thermal insulation
Authors	Adrian CIOBANU, Monica CHERECHEȘ, Florina FILIP, Ionel PUȘCAȘU, Aurelia BRADU, Daniel GHERGHEL, Marius MĂRT
Institution	¹⁾ National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development “URBAN-INCERC” Iasi Branch
Description EN	<p>This study is based on research papers, conference papers and reports which have been gathered to give a basis for the thermal and physical properties of conventional and novel high performance thermal insulation materials and components. The principle of this experiment consisted in the creation of an experimental stand that would allow to determine the thermal behavior of the flat solid bodies of the high performance insulation panels (eg vacuum panels, polystyrene plates, plasterboard boards etc.).</p> <p>The evaluation was carried out using an experimentally device made by the author (Fig. 1a), which has at the base, the principle of a hot guarded plate (Fig. 1b). The role of this device is to establish a unidirectional, constant and uniform thermal flux density through homogeneous plates in the form of flat and parallel plates, which are components of the conventional or high-performance thermal insulation materials, and create new opportunities for architects and engineers to design energy efficient buildings.</p>

RO.205.

Title EN	The potential of augmented reality in the dissemination of urban planning documentation
Authors	Teodora Ungureanu, Gabriela Voloacă, Andreea Popa
Institution	INCD URBAN-INCERC, URBANPROIECT, Bucharest
Description	Doctoral School of Urbanism, "Ion Mincu" University of Architecture and Urbanism, Bucharest

EN Different new technologies are becoming more and more integrated into our daily life. This can have an impact on aspects of urban life. Augmented reality (in short AR) is mostly associated with the gaming and entertainment industry, but it can easily become useful in the smart city scenario. This proposal explores the possibilities of using AR in the visualization of urban data and the dissemination of urban planning documentation by non-specialists. Thus the plan used to present and describe the urbanism project could be understood by the non-specialists using AR.

The interaction of the non-specialist provided through the AR, with the help of different visual interfaces that bring together different domains - urbanism, new-media art, emerging technologies - ensures an environment conducive to understanding the different urban documentations. Thus, AR can prove a good tool to understand the urban processes displayed in the technical urbanism plans by non-specialists.

RO.206.**Title EN**

A Method of ensuring ecological connectivity in the Romanian Carpathian Mountains in the context of spatial planning

Authors

Antonio Tache, Oana-Cătălina Popescu, Cristina Ivana

Institution

National Institute for Research and Development in Constructions, Urban Planning and Sustainable Development URBAN-INCERC București

The poster is based on the research carried out within the project „*Restoring and managing ecological corridors in mountains as the green infrastructure in the Danube Basin - ConnectGREEN*” (2018-2021) within the Interreg Danube Transnational Program. One of the project objectives is improving connectivity between protected areas by identifying ecological corridors for large carnivores’ movement.

Description**EN**

Landscape fragmentation represents a major threat for biodiversity preservation in the Romanian Carpathian Mountains. Urban development obstructs connection between species habitats and creates isolated patches that can lead to loss of wildlife habitats and limitation in the movement of different species. The Carpathian Convention outlines the need to ensure the habitats and species continuity and connectivity in order to protect their migration routes and to develop an ecological network in the Carpathians.

The poster aims at proposing a method of ensuring connectivity between Natura 200 areas by identifying ecological corridors used in the movement of three species of large carnivores in Romanian Carpathian Mountains: the brown bear (*Ursus Arctos*), the grey wolf (*Canis Lupus*) and the lynx (*Lynx lynx*) – species requiring a strict protection in Romania.

The method is addressing a very important aspect in the context of spatial planning, since establishing the location of migration corridors and Natura 2000 sites connectivity will help to translate this approach in territorial plans and to make reconciliation between spatial planning and ecology. A responsible spatial planning could help improving ecological connectivity between protected areas and habitats and maintaining ecological corridors which secure the population of large carnivores.

RO.207.
Title EN

Economic vulnerabilities in the cities of the Danube.

Authors

Case study Turnu Măgurele

Institution

Andreea Cătălina Popa, Teodora Ungureanu, Gabriela Voloacă
Universitatea de Arhitectură și Urbanism “Ion Mincu”

Romanian cities, located along the Danube corridor, are experiencing a decline in economic activities, in the context of closing the largest economic agents. By building a chemical compound in 1962, Turnu Măgurele has developed a lot. Subsequently, the opening of other industrial units led to an expansion of the city, correlated with the increase in the number of inhabitants.

**Description
EN**

There are several indicators used in the analysis of economic vulnerabilities. Of these, are highlighted the gross domestic product, the unemployment rate, the volume of investments.

The dependence on a single industrial branch has led to a decrease in the quality of life. After 1990, in the context of the closure of several economic units, the city began to face an increasing number of layoffs. The lack of investments has led to the departure of the young population to other areas or even outside the country, where they can find jobs.

The city must capitalize on its potential by locating it on the Danube. In this context, the authorities must consider investments in the field of transport and warehousing activities.

RO.208.**Title EN**

Cement-based materials with self-repairing properties induced by reactive grains with protective coating

Authors

Constantin-Dorinel VOINIȚCHI, Flavius-Valeriu CLADOVEANU, Miron ZAPCIU, Adriana NICOLAE, Nicoleta-Adaciza IONESCU, Cătălin DIMA, Vasile MEIȚĂ, Claudiu-Lucian MATEI, Henriette SZILÁGYI, Cornelia BAERĂ, Andreea-Cristina HEGYI, Mihaela SANDU, György DEÁK, Mihaela-Andreea MONCEA, Florina-Diana DUMITRU, Ana-Maria PANAIT

Institution

INCERTRANS SA, NIRD URBAN-INCERC, INCDDPM

Patent

Patent application No. A/00022 din 20.01.2020

**Description
EN**

The invention refers to cementitious materials with self-repairing properties, generated by the use of an intelligent reactive addition to the cement-based matrix. The addition consists in reactive grains with protective, impermeable polymeric coating against inherent hydration during mixing and also with friability capacity when necessary, namely when cracks occur within the cementitious matrix. This way the contact between the reactive core and water or other components is produced, developing the specific reactions which would generate reaction products with crack clogging, self-healing effect. The intelligent addition is obtained by mixing the reactive grains with polymer solution or the melt thereof, followed by the specific stages of drying / cooling, in order for the waterproofing effect to be achieved. The incorporation of the intelligent addition into the cementitious composite is performed by applying the usual technology for concrete manufacturing, at the concrete plant, or by adding it at the casting location, in the last stage of mixing. The advantages of the concept are emerging from effective increase of durability and structural lifespan extension of infrastructure where used, with resource savings considering less repair and maintenance activities required. Apart from long-term economic benefits, by applying this preventive approach the environmental protection is also achieved, by energy, labor and natural resource savings when compared to classical cement-based materials.

Acknowledgments: This research is supported by the Programme: Innovative solutions for transport infrastructure protection by the use of building materials with special self-maintenance and self-repair properties”, Programme code: 6 PS / 13.09.2019, financed by the Romanian Government.

RO.209.**Title EN**

Self-Healing effect of reactive grain addition for long-term continuous hydration in cementitious composites

Authors

Vasile MEIȚĂ, Mihaela SANDU, Claudiu-Lucian MATEI, Henriette SZILÁGYI, Aurelian GRUIN, Andreea-Cristina HEGYI, Cornelia BAERĂ

Institution

NIRD URBAN-INCERC

Concrete and the generic category of cement-based composites as building materials are generally prone to cracking, the typical way of damage induced by diverse causes into the concrete mass. Similar to living organisms, capable of self-healing their wounds, there was proved that concrete also develops a certain intrinsic ability of recover its integrity via crack healing. Upgrading this intrinsic material potential to higher degrees can bring cumulative beneficial effects in improving the durability of structures with low costs and resource consumption.

**Description
EN**

The continuous hydration of unhydrated particles present in hardened concrete was proved to be an essential source for the healing effect but in time this potential diminishes. The concept of the present research is related to identifying a practical solution for providing the long-term continuous hydration potential, for preservation of healing effect as well. This aim could be achieved by including to the generic cement-based composition an intelligent addition, containing reactive grains as source for further hydration products, but designed with polymeric coating as protection against initial hydration.

The challenges of the research are multiple, starting from identifying the optimum materials with reactive potential, efficient coating technology and evaluation of the compatibility between the cement-based matrix and the smart addition. The preliminary results are encouraging, proving the viability of the proposed theoretical concept.

Acknowledgments: This research is supported by the Programme: Innovative solutions for transport infrastructure protection by the use of building materials with special self-maintenance and self-repair properties”, Programme code: 6 PS / 13.09.2019, financed by the Romanian Government.

National Institute for Research and Development in Microtechnologies - IMT Bucharest

RO.210.**Title EN****Switch type chemoresistive humidity sensor****Authors**Bogdan-Catalin Serban, Octavian Buiu, Cornel Cobianu,
Roxana Marinescu, Viorel Avramescu, Nicolae
Dumbravescu**Institution**National Institute for Research and Development in
Microtechnologies - IMT Bucharest**Patent**

Application No. A/00442, 28.03.2018, OSIM, ROMANIA

**Description
EN**

This patent application does address the development of new, innovative sensing layers to be used in the development of chemoresistive relative humidity sensors. The sensitive layers described in this patent application are triblock – copolymer/nanocarbonic material such as PEG-PPG-PEG (polyethylene glycol-polypropylene glycol - polyethylene glycol)/oxidised carbon nanohorns. For testing, an interdigitated (IDT) structure was manufactured on Si (470 μm) covered with SiO_2 (1 μm). IDT's metal stripes have been made by successive deposition of Cr (10 nm) and Au (100 nm). The relative humidity monitoring capacity was investigated by applying a current between the two electrodes and measuring the voltage at different values of the relative humidity level at which the sensitive layer was exposed. Measurements were performed in humid nitrogen at room temperature at different relative humidity values

The use of the oxidised carbon nanohorns will provide a series of significant advantages and enhancements, in comparison with other chemoresistive humidity sensors:

- a. a high ratio between specific surface and volume;
- b. a very good detection over a wide range of temperature;
- c. the hydrophilic character of the sensitive layer can be easily modulated based on the oxidation parameters specific to the method employed (plasma power, nitric acid concentration, reflux time, etc.);

Due to the "swelling" effect, generated by the expansion of triblock - copolymer for RH values higher than 75%, a "switch" type of transfer characteristic is recorded. This is an interesting feature, with relevance for certain applications, such as those for the electronics industry

Class

10

RO.211.

Title EN	Chemoresistive humidity sensor based on carbonic nanocomposites
Authors	Bogdan-Catalin Serban, Octavian Buiu, Cornel Cobianu, Viorel Avramescu, Octavian-Narcis Ionescu, Roxana Marinescu, Cristina Pachiu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest
Patent	Application No. A/01005, 29.11.2018, OSIM, ROMANIA This patent application refers to the development of new chemoresistive humidity sensors, using nanocomposite materials based on oxidised carbon nanohorns (oxSWCNHs) and a hydrophilic polymer. The selected hydrophilic polymers are polyvinylpyrrolidone (PVP) and polyvinyl alcohol (PVA). The proposed design of the sensors employs: a dielectric layer (glass, Kapton), a series of metal electrodes (aluminum, chrome, copper) and the humidity sensitive layer. The carbon nanocomposite layer is deposited on the electrodes by using one of the following methods: spin coating, drop-casting or electrospinning. The proposed sensing structure has a couple of significant advantages:
Description EN	<ol style="list-style-type: none"> 1) enhanced viscoelastic properties for the sensitive layer, resulting in better processability of the layer. 2) the existence of the oxidised carbon nanohorns will result in a high ratio between specific surface and volume. 3) detection at room temperature. <p>The humidity detection capability was investigated by applying a current between the two electrodes and measuring the voltage at different values of the relative humidity level at which the sensitive layer was exposed. The electrical resistance of these layers will change proportional to the relative humidity level. Using polyvinylpyrrolidone - based nanocomposite, the structure exhibits linear and good RH sensitivity when varying RH from 0% up to 90% in humid nitrogen. The sensor has a close response to Sensirion's commercial sensor (Fig. 1) fast response time, and good stability over time.</p> <p>The oxSWCNHs are p-type semiconductor materials, and water molecules, by donating electron pairs) reduce the number of holes. From a strictly electric point of view, this phenomenon leads to an increase in the measured resistance value.</p>
Class	3

RO.212.

Title EN	Chemoresistive humidity sensor based on oxidised carbon nanohorns
Authors	Bogdan-Catalin Serban, Octavian Buiu, Cornel Cobianu, Viorel Avramescu, Nicolae Dumbravescu, Roxana Marinescu,
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest
Patent	Application No. A/00443, 22.07.2019, OSIM, ROMANIA This patent application claims the design of new sensitive layer, to be used for the development of relative humidity resistive sensors. The sensitive layers proposed in this patent application are based on oxidised carbon nanohorns. The sensing structure is an interdigitated (IDT) structure, manufactured on a Si substrate (470 μm thickness), covered by a SiO_2 layer (1 μm thickness). The metal stripes of IDT comprise Cr (10 nm thickness) and Au (100 nm thickness). For obtaining the SWCNHs - based sensing layer, the following synthesis route was followed: (i) 0.5 g of oxidized SWCNHs were dispersed in 25 mL DI water - ethanol (50:50%, v/v) and subjected to magnetic stirring for two hours at room temperature. (ii) the resulted dispersion was deposited by the “drop casting” method on the sensing structure (after previously masking the contact area). (iii) the sensing layer was subjected to heat treatment at 100° C, for two hours, under vacuum. The RH response of the sensor was investigated by applying a current between the two electrodes and measuring the voltage drop when varying the RH from 0% up to 90%, both in humid nitrogen environment (Fig. 1) and in air. The electrical resistance of these layers will change proportional to the relative humidity. The use of oxidised carbon nanohorns will provide a series of significant advantages: high sensitivity (commercial Sensirion RH sensor exhibits a comparable performance), fast response time, a high ratio between specific surface and volume, excellent thermal and chemical stability.
Description EN	
Class	9

RO.213.

Title EN	Ternary nanocomposite for the relative humidity resistive sensor and method for its manufacture
Authors	Bogdan-Catalin Serban, Octavian Buiu, Viorel Avramescu Cornel Cobianu, Roxana Marinescu,
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest
Patent	Application No. A/00585, 23.09.2019, OSIM, ROMANIA This patent application refers to the development of new chemoresistive humidity sensors, employing a sensing layer based on a ternary nanocomposite comprising single wall oxidized carbon nanohorns - graphene oxide – polyvinylpyrrolidone, at 1:1:1 w/w/w ratio. The interdigitated (IDT) sensing structure was manufactured on a Si substrate (470 μm thickness), covered by a SiO_2 layer (1 μm thickness). The metal stripes of IDT comprised a Cr (10 nm thickness) and Au (100 nm thickness) stack, having 200 μm width. 6 mm was the distance between the electrodes. For obtaining the ternary nanocomposite-based sensing layer, the following synthesis route was followed: (i) each 0.2 g of oxidized SWCNHs, graphene oxide and polyvinylpyrrolidone were dispersed in 10 mL DI water and subjected to magnetic stirring for three hours at room temperature. (ii) the resulted dispersion was deposited by the “drop casting” method on the sensing structure. (iii) the sensing layer was subjected to heat treatment at 80° C, for two hours, under vacuum. The RH detection capability of the structure was investigated by applying a current between two electrodes and measuring the resistance of the IDT, at different RH levels. The sensor structure exhibits a linear response and good RH sensitivity when varying RH from 0% up to 90% in humid N_2 environment. The sensor response time and stability are comparable to that exhibited by a commercially available Sensirion RH sensor (Fig. 1).
Description EN	
Class	5

RO.214.

Title EN	Resistive sensor for monitoring the relative humidity and process for manufacturing it
Authors	Bogdan-Catalin Serban, Octavian Buiu, Cornel Cobianu Viorel Avramescu, Nicolae Dumbravescu, Roxana Marinescu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest
Patent	Application No. A/00517/28.08.2019, OSIM, ROMANIA This patent application refers to the development of new chemoresistive humidity sensors, employing a sensing layer based on oxidized carbon nanohorns (SWCNHs)–fullerenol (Fig. 1) – Poly(acrylamide- <i>co</i> -acrylic acid) partial sodium salt ($M_w= 520,000$) nanocomposite. The interdigitated (IDT) sensing structure was manufactured on a Si substrate (470 μm thickness), covered by a SiO_2 layer (1 μm thickness). The metal stripes of IDT comprised a Cr (10 nm thickness) and Au (100 nm thickness) stack, having 200 μm width. 6 mm was the distance between the electrodes. The RH detection capability of the structure was investigated by applying a current between two electrodes and measuring the resistance of the IDT, at different RH levels. The use of the ternary nanocomposite oxidised carbon nanohorns/fullerenol/poly(acrylamide- <i>co</i> -acrylic acid) partial sodium salt will provide a series of significant advantages and enhancements, in comparison with other chemoresistive humidity sensors:
Description EN	<ol style="list-style-type: none"> a high ratio between specific surface and volume. a very good detection over a wide range of temperature; the hydrophilic character of the sensitive layer can be easily modulated based on the oxidation parameters specific to the method employed (plasma power, nitric acid concentration, reflux time, etc.); Fullerenol has a pronounced antioxidant character, hydrophilic properties, good compatibility with oxidized carbon nanohorns; <p>Poly (acrylamide-<i>co</i>-acrylic acid) - partial sodium salt, is a hydrophilic polymer that ensures the cohesion of the two nanocarbon materials, being an excellent binder.</p>
Class	7

HONEYWELL ROMANIA SRL

RO.215.
Title
Relative humidity sensor and method
Authors

Bogdan-Catalin Serban, Mihai Brezeanu, Octavian Buiu, Cornel Cobianu

Institution

Honeywell International Inc. Morris Plains, NJ 07950, USA

Patent no.

EP 3 211 408 B1, 10-04-2019

This patent claims a capacitive humidity sensor with low hysteresis including a first electrode, a second electrode disposed above a dielectric substrate, a sensing layer, and a dust protection layer disposed above the sensitive layer. Cellulose acetate butyrate - hydrophobic filler matrix nanocomposite acts as sensing layer for humidity detection. The hydrophobic filler can be organic compound such as Viton or lignin or inorganic such as calcium carbonate, barium sulphate, talc, synthetic fluorine mica, and wollastonite.

The manufacturing process of the sensor includes the following steps:

- a) A silicon wafer which is exposed to thermal oxidation to develop an about 1 micrometer thick layer of thermal SiO₂.
- b) A thick layer of a Ti/Pt electrode is deposited over the Si/SiO₂ wafer.

Description

- c) One then prepares a cellulose acetate butyrate solution (10%) by dissolving cellulose acetate butyrate powder in ethyl alcohol. Wollastonite slurry (3%) was prepared from unmodified wollastonite and ethyl alcohol, ultrasonically stirred at room temperature, for 24 hours.

- d) The wollastonite slurry is then mixed with the cellulose acetate butyrate solution and the mixture is ultrasonically stirred at room temperature, for 24 hours.

- e) The cellulose acetate butyrate solution comprising the wollastonite suspended therein can be spin coated onto the lower electrode and placed in an oven to cure in air.

- f) A porous platinum electrode is then deposited and patterned on top of the cured sensing layer.

- g) A cellulose acetate butyrate film can be spin coated on the surface of upper electrode, which acts as a dust removal thin film.

Class

7

RO.216.**Title****Benzene sensor and associated methods****Authors**

Bogdan-Catalin Serban, Octavian Buiu, Mihai Brezeanu, Cornel Cobianu, Cazimir Gabriel Bostan, Cristian Diaconu

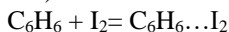
Institution

Honeywell International Inc. Morris Plains, NJ 07950 (USA)

Patent no.

US 10, 254, 217, B2 Apr.9, 2019

This invention introduces a novel, environmentally friendly, gas-phase benzene sensor based on the supramolecular chemistry principles and on Ultra-Violet Visible (UV-VIS) detection. It is well-known that benzene reacts with iodine and generates a charge -transfer complex which can be easily recognized due to its characteristic UV absorption band. This spectroscopic feature is attributed to a partial intermolecular charge transfer between an electron-acceptor (iodine) and an electron-donor (benzene):

**Description**

However, there is major drawback when trying to manufacture a benzene sensor using iodine as sensing material. Although a solid, iodine is highly volatile and can sublime even at room temperature. In order to stabilize it, iodine can be encapsulated in the cavity of either α -, β -, γ -cyclodextrines or their derivatives ((2-hydroxypropyl)- β -cyclodextrin).

The cyclodextrine-iodine complex is stable due to the van der Waals forces which exist between the hydrophobic interior of the cyclodextrin (host molecule) and iodine as guest molecule. The dissociation of the iodine-cyclodextrine supramolecular assembly can be achieved above room temperature ($>50^\circ\text{C}$). At the same time, benzene has a significantly larger affinity for iodine than for cyclodextrine. Therefore, when exposed to benzene, the supramolecular cyclodextrine-iodine complex is expected to eliberate iodine, thus leading to a benzene-iodine reaction which can be optically detected.

Benzene sensor comprises a substrate having an iodine complex disposed thereon, a radiation source configured to project UV radiation onto the complex and a UV detector configured to detect a UV reflection off of the substrate having the iodine complex (Fig.1).

Class

2

SC DFR Systems SRL

RO.217.

Title	Materials for making different models of biofilm carriers
Institution	Ioana Corina Moga, Gabriel Petrescu
Authors	DFR Systems SRL
Patent no.	Patent application No. A/00122/ 04.03.2020
Description	<p>A new material was developed for the realization of the biofilm carriers – a product that is used for the biological treatment of different types of wastewaters. The new material is a combination between high density polyethylene, talcum and cellulose. During the researches made by DFR, was proved that compared to 100% HDPE, the biomass attached on the biofilm carriers realized from the new material, increased with more than 400%. More than this, on this new material other types of microorganisms, like white root fungi (WRF), can attach. These types of WRF were not used up to now in wastewater treatment processes, but now, by using these new materials other types of wastewaters (especially those containing cellulose) can be treated by biological techniques.</p>
Class	1

Arexman Construct SRL

RO.218.
Title

“iSentinel® Home/Immo/Industry IoT” intelligent earthquake protection solution

Authors

Mircea MANOLESCU

Institution

Arexman Construct

Patent

RO120284

An open and fully customizable IoT integrative solution for life saving and industrial plants, buildings, facilities, assets and environment protection in case of major earthquake and other disasters.

Applications: intelligent proactive protection for avoiding the devastating consequences of earthquakes on buildings and industrial plants and early warning for human life saving.

Description

Structured on three levels, detection / decision / execution this innovative solution allows to integrate at the first level both alternative inputs in order to connect in any moment to other reliable edge cutting technology systems and complementary inputs (gas, smoke, water and/or personalized detection) to extend our solution to other kind of protection if no earthquake.

The second level allows the intelligent management of the input data, the making of decisions based on the real situation at the user's place and triggers the appropriate protection by following pre-set protocols.

The third level realizes the effective protection by stopping the processes which could harm humans and destroy assets and/or represents a threat for the environment and communicates with the BMS and the Fire Central to realize an integrated protection.

Class

12



NATIONAL

“Moldova” National Complex of Museums, Iasi, Romania

RO.219.

Title	Equipment for treatments in high frequency cold plasma
Authors	Dr. Ghiocel Ioanid ¹ , Dr. Lăcrămioara Stratulat ² , Dr. Dorina Rusu ²
Institution	¹ “Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania ² “Moldova” National Complex of Museums, Iasi, Romania
Patent	Patent application No. A/00249/2019
Description	<p>The invention refers to an equipment for treatments in cold HF plasma, performing the decontamination and cleaning of fragile items with complex geometry belonging to cultural heritage using afterglow plasma.</p> <p>The equipment is made of a cylindrical reaction vessel sealed with two electrode- flanges. A detachable module is placed inside on which an annular frame for object fastening and two circular electrodes, forming pairs with the electrode- flanges, are mounted. Active plasma is generated between the two pairs of electrodes, capacitively coupled to an HF generator. By the superposition of the fluxes of reactive particles diffused from the active discharge homogeneous afterglow plasma appears between the circular electrodes.</p> <p>The equipment is designed for restoration-conservation laboratories from museums, libraries or archives.</p>
Class	5

SC OSA Inovation Product SRL

RO.220.

Title

Composition for pre-dosed mortar

Authors

SÎRBE Gheorghe Stănică, PANAITE Sorin Vasile, SANDU Ion, COPCEA Dan Mircea, SANDU Andrei Victor, SÎRBE Olimpiu Laurențiu, SANDU Ioan-Gabriel, POP Octavian,

Institution

SC OSA INOVATION PRODUCT SRL

Patent

Application no. AA/00555/2019

Description

The invention relates to a composition for pre-dosed mortar with a volumetric weight of less than 250 kg / m³, a coefficient of thermal conductivity below 0.08 Kcal / m²h°C and a mechanical strength of more than 7 daN / cm², which consists of 250 parts by weight mixture of fly ash resulting from the burning of sunflower husks, Portland cement and ground lime to a fineness of 6 ... 10% residue on a sieve of 4900 mesh / cm², in gravimetric ash ratio: Portland cement: slaked lime = 10:50:40, then 90 parts by weight expanded perlite and 10 parts by weight dextrin, which finally, before application, is mixed with 300 parts by weight water. To optimize the mixing process of redispersible powders, the three basic components are mixed in gravimetric ratio: fly ash: slaked lime: Portland cement = 10:40:50, and separately mixed fine dextrin powder with expanded perlite, in gravimetric ratio 4,5: 0,5, after which the two powdered systems in the dry state are mixed by kneading for 10 ... 20 minutes, then homogenized by sieving using a 0.063 mm mesh sieve and packed in airtight bags, as before use the pre-dosed mortar is mixed with water in a gravimetric ratio of 1.2: 1.0.

Class

7

RO.221.

Title

Composition For Insulating Cellular Concrete

Authors

SÎRBE Gheorghe Stănică, PANAITE Sorin Vasile, SANDU Ion, COPCEA Dan Mircea, SANDU Andrei Victor, SÎRBE Olimpiu Laurențiu, SANDU Ioan-Gabriel, POP Octavian,

Institution

SC OSA INOVATION PRODUCT SRL

Patent

Application no. AA/00556/2019

Description

The invention relates to a composition for thermal, sound- and sound-insulating lightweight cellular concrete, based on expanded perlite as an aggregate and three classic binders: fly ash: Portland cement: fine CaO powder in gravity ratio: fly ash: slaked lime: cement Portland = 30:30:40, which is mixed in a mixer for 15 ... 20 minutes, then in the same mixer it is mixed with expanded perlite,

NATIONAL

in volumetric ratio 1: 8, for 10 ... 15 minutes , after which it is mixed with water in gravimetric ratio varying between 2: 1 and 4: 3, and the final paste is poured into formwork, with specific profiles and adapted for different masonry, as after 24 hours of setting (hardening) the concrete is stripped and then sprayed with running water at a temperature of 18 ... 22.5 ° C, at intervals of 12 hours, for 6 days, to reform the leaceable crystallization water, and after a storage of at least 10 days in ventilated halls will be used to implement uno r engineering constructions, as construction material

Class

7

Romanian Inventors Forum

RO.222.

Title

Device and procedure for the treatment of perforation and rupture of the esophagus

Authors

Bogdan Mihnea CIUNTU, Dan Vasile TIMOFTE, Ion SANDU, Stefan Octavian GEORGESCU, Andrei GEORGESCU, Ciprian VASILUȚĂ, Andrei Victor SANDU, Bogdan Florin TOMA, Stefan Lucian TOMA, Ioan Gabriel SANDU,

Institution

Romanian Inventors Forum

Patent

Pending A00203/2020

Description

The invention relates to a device and method for treating esophageal perforations and ruptures, which is applied in visceral surgery to treat gastric and / or duodenal esophageal perforations, using endoluminal negative pressure (E-VAC) therapy, continuously controlled by endoscopy and intermittent with a computed tomography (CT) computer, which allows a faithful and detailed exploration of the defect, with preoperative preparation of the work kit (prefabricated kit), consisting of an adjustable silicone nasogastric tube with double lumen and a spongy sleeve made of polyurethane sponge at the distal end, a vacuum size S kit, microsurgical tool and a vacuum pump, which are reformulated in correlation with the dimensions and morphostructural characteristics of the defect.

Class

4

Alexandru Ioan Cuza University (2)

RO. 222A

Title	Statistical methods of analysis on the distribution of setting passes in volleyball using the application (ProVBallStat 2.0)
Authors	Stirbu Ilie-Catalin, Rohnean Adrian Ionel, Stirbu Catalina Mihaela
Institution	Al. I. Cuza University Iasi Gh. Asachi Technical University Iasi
Description	<p>In modern sports winning is conditioned by giving the attention to every detail. Setting distribution is a very important parameter in modern volleyball. It is very important to know at any time what is the setter chosen. 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. The opponent's setter statistical monitoring is an essential stage in a match and the "reading" of the passing, decrypting the mode of action can be the key to winning a match. This monitoring phase is a complex process involving many parameters and fineness / speed in observation.</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>
Class	4

RO. 222B

Title	Electronic application of organizing a beachvolleyball tournament
Authors	Stirbu Ilie-Catalin, Rohnean Adrian Ionel, Stirbu Catalina Mihaela
Institution	Al. I. Cuza University Iasi Gh. Asachi Technical University Iasi
Description	<p>By this application we try to facilitate the organization of beachvolleyball competitions and tournaments. 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</p>

Independent Inventors

Ion CRISTESCU

RO.223.

Title

Chemical Reactor For Reprocessing Isotopes Of Nuclear Fuels

Authors

ION CRISTESCU

Patent

RO 129854/2019

The invention refers to a chemical reactor for reprocessing isotopes of spent nuclear fuel CANDU, obtaining plutonium isotopes and manufacturing a new generation driver fuel mixed-oxides (MOX) with more nuclear power.

The chemical reactor separates all fission products from spent fuel. Components of nuclear chemical reactor: module radiochemical reactor generator isotopes azotates U(VI), Pu(IV), in communication with modules extractor reactor complexes isotopes azotates with butylphosphates (TBP) washing scrubber with distilled water of complexes, reactor isotopes azotates Pu(III) in aqueous nitric solution and extractor complexes isotopes azotates U(VI) with TBP, reextractor reactor isotopes azotates U(VI) from organic phase in distilled water and crystallizer reactor for isotopes oxalates U(VI).

Description

This reextractor reactor isotopes azotates Pu(III) is in communication with modules: extractor reactor complexes isotopes azotates Pu(IV) with octylamine (TOA), reextractor complexes isotopes azotates Pu(IV) with TOA in aqueous nitric solution 2M HNO₃ and crystallizer reactor for isotopes oxalates Pu(IV).

These extractors reactors, crystallizers and scrubber are in communication with a distiller with vaporizer water, nitric acid, condenser vapour and collector for salts radioactive waste.

Advantages: -productivity more with 40% in comparison with apparatuses, plants well-known;

-the rates of radiochemical reaction more at reprocessing of spent nuclear fuel;

-nuclear purity degree advanced of uranium, plutonium isotopes;

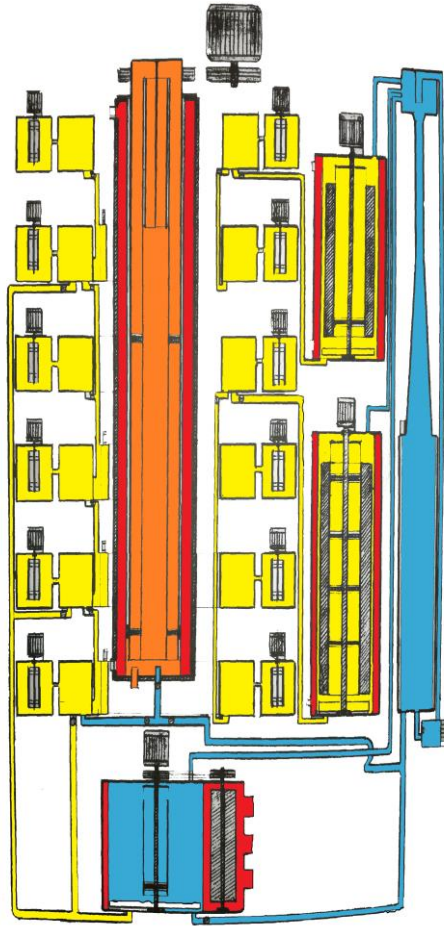
-the recycling of zirconium from spent elements nuclear fuel CANDU and manufacturing new tubes for elements

NATIONAL

fuel MOX;
-advanced degree of nuclear security.

Class

9



Romeo CĂTĂLINOIU

RO.224
Title EN
Self-Adaptive Mechanical Reducer with Variable Gear Ratio
Authors

 Romeo CĂTĂLINOIU, Sorin Aurel RAȚIU,
Imre Zsolt MIKLOS

Institution

-

Patent no.

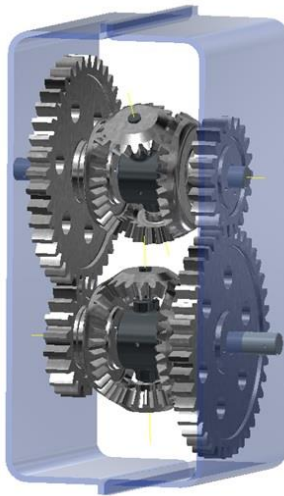
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**Description
EN**

The invention relates to a mechanical reducer integrated in the transmission of an full electric car, in order to reduce the electricity consumption required by the motors, during running under real road conditions and to improve Dynamics. The reducer allows the continuous, self-adaptive variation of the total gear ratio, between two limit values, depending on the load torque, ensuring the operation of the motors on a restricted range of speeds and with minimum electricity consumption.

Class no.

8



Mircea SANGEORZAN

RO.225.

Title **Ramp Elasticity Engine**
Authors **Mircea Sangeorzan**
Institution **Roadstone Model S.R.L.**
Patent **A/00756 18-11-2019**

Description

The functionality of this motor employs several elements of Physics, like: the decomposition of forces in a ramp, the tangent component of the force, the elasticity of a material and action and reaction.

This motor operates only according to the laws of physics, it does not require fuel, the pollution is 0. It can be built in various dimensions. The larger the circles, the more cart assemblies can be mounted. The same motor size can offer different power output depending on the thickness and wideness of the circles.

All its components are recyclable.

8. Aviation, car industry and transportation

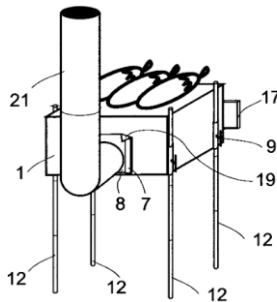


Alexandru-Leontin SÎRB**RO.226.****Title****DISMANTABLE AND PORTABLE STOVE FOR SOLID FUEL****Authors**

Alexandru-Leontin SÎRB

SÎRB A. ALEXANDRU LEONTIN I.F.WO2017/010901 / EP16778475.0 / (RO) U-2015-00044**Patent**

Invention relates to a dismantable and portable stove for solid fuel, comprising a body shaped as a right prism having an opening with borders to which attaches a cover; inside body there is a tray, effortlessly removable through the opening; the rear wall of body has a middle hole for discharging smoke, flanked by bails in which a flange is sliding; in the corners of the body there are some tubes provided with butterfly screws which, during transportation, secure the ends of a handle; during use of the stove, tubes allow individual fixing and adjusting the height of the supportive legs; a flange has at least one bend in the upper part that stops its sliding along bails, and aligned with hole the flange is provided with a hose connected to a smoke chimney; one of the bases of the body has a circular hole large enough to allow the "sinking" of the bottom of a cauldron whose periphery rests on the circumference of the hole.

Description**14.** (Patent Clasif. IPC: F24B 1/20 ; CPC: F24B 1/205)

Costel Ciprian SCLIPCEA

RO.227.
Title
Electro- pneumatic caloric energy generator
Authors

Sclipcea Costel-Ciprian, Draghici Costel, Neagu Petre, Scintee Alexandra

Is a heating system that can be used in closed or open circuit for heating or preheating a circulation fluid. The project has 2 under pressure tanks disposed in the mirror (face to face), contains inside coil with circulation fluid.

The existent pressure from tanks is disturbed(in sens of increase or decrease) by a common plonjer (piston), liniar acting driven by a low power electrical motor, all reported to the efficiency of the system as on both sides of the piston acting the same force values.

Patent

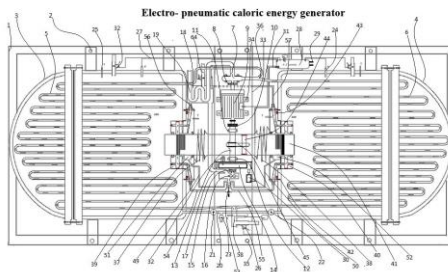
During the translation of the piston, when is reaching one of the stroke end, kinetical energy is recovered by compression springs and balance value between the pressures in tanks(respectively when the pressure is released in one tank, in the other the pressure increase).

Also under the piston, each one of the heads are designed with a chamber under oil pressure creating a levitation of piston, reducing the friction.

With such a design, the energo-caloric energy efficiency it's very high, another cause is also that the all moving parts are driven by a single electric motor.

Description

2





1. AUTOMAT SONERIE ŞCOLARĂ

Josanu Rareş Ionuţ cl a XII a

Dabija Ana cl a VI a

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Prof. Colbu Gheorghe

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Josanu Rareș Ionuț cl. a XII 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



Interactive Science Festival "Nikola Tesla"

25-29 May 2020- 4th Edition

Meeting Place:
Online



Sensu Victor
Lecturer at Cluj-Napoca
Technical University



Silviu Gurlui
Conf. Univ. Dr. Habil.



Cătălin Beldea
Astronomer



Cristian Presură
Physicist



Vlad Martinus
Mathematician



Carmen Dragomir
Coordinator at The Duke of
Edinburgh's International Award
Romania



Anemaria Hâncu
Co-founder Lot's do
it Romania



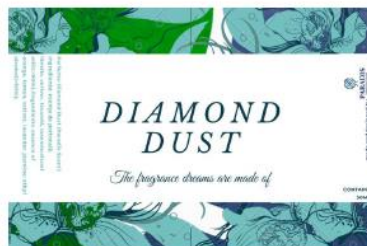
Dumitru Prunariu
Cosmonaut



Bogdan Ilescu
Neurosurgery
specialist

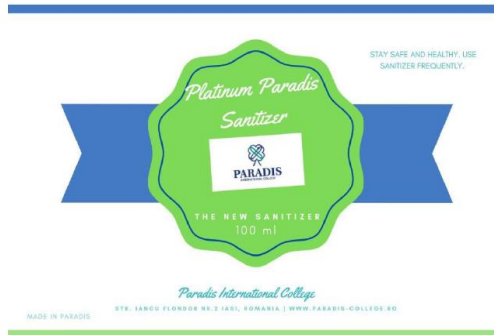
Produse create de elevii Paradis în cadrul Festivalului Interactiv al Științelor „Nikola Tesla”

1. Parfumul DIAMOND DUST BY PARADIS



2. Dezinfectantul PLATINUM PARADIS SANITIZER

Ingrediente - 100 ml dezinfectant: 83,33 ml alcool etilic 96%, 4,17 ml apă oxigenată 3%, 1,45 ml glicerină 98%



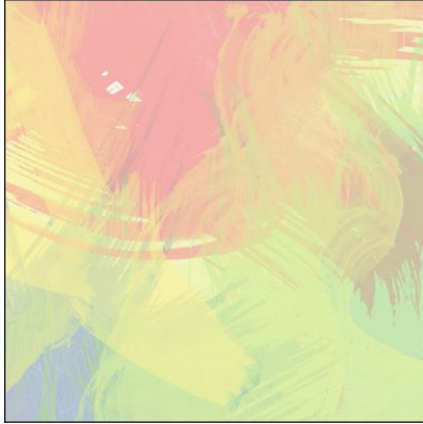
3. Costum de protecție din material impermeabil

Realizat manual, Costumul este cu totul, tip salopetă și fermoar anterior. A fost realizat din material de pelerină de duș, cu conținut ridicat de poliester, este ușor de purtat și spălat, chiar în timpul purtării. Costurile finale ale acestui costum nu depășesc de 30 ron.



EUROINVENT

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13-22 May 2020

with special help of:
cu sprijinul deosebit al:



Universitatea Națională de Arte
George Enescu
Iasi



National University of Arts "George Enescu" Iasi
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Universitatea Națională de Arte
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UNAGE

Euroinvent 2020



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Conf.univ.dr. Cristian Ungureanu
Dr. Mirela Ștefănescu

Coordonator Euroinvent:
Șef lucrări dr.ing. Andrei Victor Sandu
Președinte al Forumului Inventatorilor din România

Artiști participanți:

Jeno Bartos, Gabriela Benescu, Zamfira Bîrzu, Bianca Boros,
Ilie Bostan, Cornelia Brustureanu, Cezarina Caloian, Adrian Crișmaru,
Cristina Filote, Bogdan Gavrillean, Florin Grigoraș, Miruna Hașegan,
Cristina Hirțescu, Raluca Hodoroba, Cosmin Iatesen, Modesta Lupascu,
Ecaterina Marghidan, Cristian Neagoe, Nicu Oniciuc, Ioana Palamar,
Andrei Pantea, Dragos Patrascu, Florin Pinzariu, Ioan Pricop, Valentin Sava,
Atena-Elena Simionescu, Mircea Ștefănescu, Cristea Simion, Cristina Stratulat,
Adrian Stoleriu, Andreea Stoleriu, Liviu Suhar, Mihai Tarasi, Constantin Tofan,
Cristian Ungureanu, Mădălina Vieriu, Tiberiu Vlad

Galeria *Universitas*
a Universității Naționale de Arte "George Enescu" Iași
(Casa Balș)

Vernisaj și Premierea:
Luni, 13 MAI 2019, ora 17.00

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11. Florin Grigoraş
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13. Cristina Hîrţescu
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18. Ioana Palamar
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- 23. Ioan Pricop
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- 34. Mihai Tarasi
- 35. Constantin Tofan
- 36. Cristian Ungureanu
- 37. Mădălina Vieriu
- 38. Tiberiu Vlad

Eveniment expozițional înscris în seria de evenimente care celebrează, în acest an, 160 de ani de la instaurarea învățământului artistic modern din România, prin crearea în octombrie 1860, la Iași, a primei Școli de Arte Frumoase și a Conservatorului de Muzică și Declamațiune – actuala Universitate Națională de Arte "George Enescu" și a primei Pinacoteci – colecția de bază a ceea ce avea să devină Muzeul de Artă de la Palatul Culturii din Iași.



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2	Grigore TINICĂ, Mihaela GRECU	Standardizarea tehnicii ablativă în fibrilația atrială	978-606-13- 4096-5	2017	78
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5	Petronela ANGHELUȚĂ	Cronici și gânduri	978-606-13- 4918-0	2019	124
6	Georgeta TUDORA	Însemnările Anastasiei	978-606-13- 5564-8	2020	228



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11.	Oana FLORESCU, Monica NĂNESCU	Prof.univ.dr. Margareta PONI (1889-1973) Mărturii de referință biografică și științifică	Palatul Culturii	978-606-8547-39-8	2019	30
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19	Petre GASCA	Satul Botesti - Horodniceni, tinut de legenda si dor. Monografie istorica, Editia a doua revizuita si adaugata,	StudIS, Iași	978- 606- 48- 0411-2	2019	232
20	Maria APETROAIEI	În culisele vieții	Vasiliana 98, Iasi	978- 973- 116- 671-1	2020	346

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1.	Viorel BOLDUMA	Raporturile Țării Moldovei cu centrele ortodoxe de peste hotare (sfârșitul secolului XIV- secolul XVII) – curs universitar	UPS "Ion Creangă"	978-9975-46-395-9	2018	265
2.	Vladimir GUȚU, Mihail PAIU, Tatiana REPIDA, Carolina ȚURCANU, Corina VASILACHE, Otilia DANDARA, Viorica GORAȘ- POSTICĂ, Maia ȘEVCIUC, Nina BÎRNAZ, Natalia TOMA, Elena MURARU	Conexiune și continuitate între și intra cicluri de învățământ superior. Studiu monografic.	CEP USM	978-9975 - 142-76-2	2018	375
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7.	Valeriu DULGHERU	Basarabie răstignită, Vol 16	Tipografia „Balacron”	978-9975- 45-215-1	2020	288
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2	INTERNATIONAL JOURNAL OF CONSERVATION SCIENCE Editor-in-Chief: Prof. univ. dr. Emeritus Ion SANDU	Forumul Inventatorilor Romani	ISSN: 2067- 533X/eISSN: 2067-8223	9	10
3	CHEMISTRY JOURNAL OF MOLDOVA Editor-in-Chief: Acad. Gheorghe DUCA	Chemical Society of Moldova	ISSN 1857- 1727 ISSN 2345- 1688	13	14
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12th edition

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și de inovare în actualul context european

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P R E F A Ț Ă

Brandul EUROINVENT, susținut de Forumul Inventatorilor Români și de Europe Direct Iași, reprezintă un proiect modern, care a permis în ultimii 12 ani realizarea unei manifestări complexe, cu multiple ținte, adresându-se tuturor creatorilor de bunuri materiale și spirirtuale (inventatori, universitari, cercetători științifici, artiști etc.). S-a dorit acest lucru, pentru a atrage atenția guvernanților asupra faptului că inventica este un segment al creativității naționale, care asemănător artei și științei, trebuie să fie subvenționată de stat, iar brevetarea să fie gratuită. Mai mult, proprietatea intelectuală și cea industrială să fie protejate prin legi diferite, să nu mai existe sistemul de re-brevetare a invențiilor, ci doar cel de transfer tehnologic, sub formă de Patent (licența de aplicare).

O invenție, o dată brevetată, trebuie să rămână în portofoliul inventatorului și în zestrea unei națiuni sub forma unui brevet, respectiv patent din fondul personal sau public (Fondul Național de Invenții), de unde la cerere să fie transferată ca licență de aplicare în baza unui contract, prin Oficiul de Stat pentru Invenții și Mărci (OSIM). Juridic, pentru a proteja inventatorul este preferat sistemul de re-patentare și nu cel de re-brevetare.

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 dezbat 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 invenție în formarea tinerilor.

La actuala ediție, organizată on line din cauza pandemiei, cititorii care vor parcurge prezentările de pe pagina web și autorii 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 23 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 12-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, Invenție 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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International Conference on Innovative Research

May 21st to 22nd, 2020

Iasi – Romania

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During the Conference leading researchers, engineers and scientists will present actual research issues in the field of Materials Science and Engineering.

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Invited Speaker – Assoc.Prof.PhD. Hanaa HACHIMI

Invited Speaker – Assoc.Prof.PhD. Shayfull Zamree Abd RAHIM

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