Chip-integrated optical sensor

Summary

A label-free, integrated HCG-based optical sensor which provides specific properties has been developed by a Berlin-based German university. The special geometry of the sensor allows the transformation of the whole or of only a part of a normal or of an oblique incidence wave into the in-plane direction. Application fields are environmental monitoring, homeland security, biomedicine, biochemistry or pharmacy. The university is interested in a R&D cooperation or a license agreement.

Creation Date	25 September 2017
Last Update	06 October 2017
Expiration Date	06 October 2018
Reference	TODE20170925001

Details

Description

A Berlin-based German university active in the field of optics has developed a prototype (maturity level 1) of a label-free, integrated HCG-based optical sensor. (A high contrast optical grating (HCG) is a single layer near-wavelength grating physical structure where the grating material has a large contrast in index of refraction with its surroundings. A label or probe is a molecule that is attached chemically to aid in the labeling and detection of a biomolecule such as a protein, antibody, or amino acid.)

The developed sensor provides very specific properties due to its special geometry, which allows the transformation of the whole or of only a part of a normal or of an oblique incidence wave into the in-plane direction. The main advantages of the sensor are its very high sensitivity and the possibility to use a cheap and available vertical cavity surface emitting laser (VCSEL). (No expensive “classic” optics are needed.)

The sensor can be used to detect biomolecular, biochemical and chemical interactions. Possible fields of application are environmental monitoring, homeland security, biomedicine, biochemistry or pharmacy.

The university is looking for partners to develop a ready to the market product. This could be done in the framework of a research cooperation agreement or a license agreement. A license agreement would authorize a partner to use the material and know-how for the further development which leads to the market introduction of the product. But the university is also open to a research cooperation agreement where skills are shared to further the development of the technical aspects with the aim to develop a product which is ready to the market.

Advantages and Innovations

- Use of cheap and available VCSEL device possible
- Monolithically integration of VCSEL as optical source possible

- No expensive “classic” optics needed
- Function given by the finite-size HCG only
- Easy integrated detection due to the redirection of light
- Very high sensitivity
- Multiple detections possible integrated in an array operating with identical VCSELs

Stage of Development

Prototype available for demonstration

IPR Status

Patent(s) applied for but not yet granted

Comment Regarding IPR status

US patent pending with notice of allowance.

Profile Origin

Other

Keywords

Technology

02007012	Optical Materials
05001001	Analytical Chemistry
05002001	Biosensor
05003002	Optics
09003	Electronic measurement systems

Market

01006001	Defence communications
03005	Laser Related
03007002	Other measuring devices
03007003	Other analytical and scientific instrumentation
04005	Biochemistry / Biophysics

NACE

C.26.7.0	Manufacture of optical instruments and photographic equipment
C.26.8.0	Manufacture of magnetic and optical media
M.72.1.1	Research and experimental development on biotechnology
M.72.1.9	Other research and experimental development on natural sciences and engineering

Network Contact

Issuing Partner

ASTER - SOCIETA CONSORTILE PER AZIONI

Contact Person

Giulia Basilici

Phone Number

+39 51 6398099

Email

giulia.basilici@aster.it

Open for EOI : Yes

Dissemination

Send to Sector Group

Bio Chem Tech

Client

Type and Size of Organisation Behind the Profile

University

Year Established

0

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
German

Client Country

Germany

Partner Sought

Type and Role of Partner Sought

The university is looking for partners for a license or a research cooperation agreement.
In the framework of a license agreement a partner's role would be the development of a ready to

the market product. Partners could be SME or industry. In a research cooperation agreement the partner could be a SME or a university to further develop the technical aspects of the technology.

Type and Size of Partner Sought

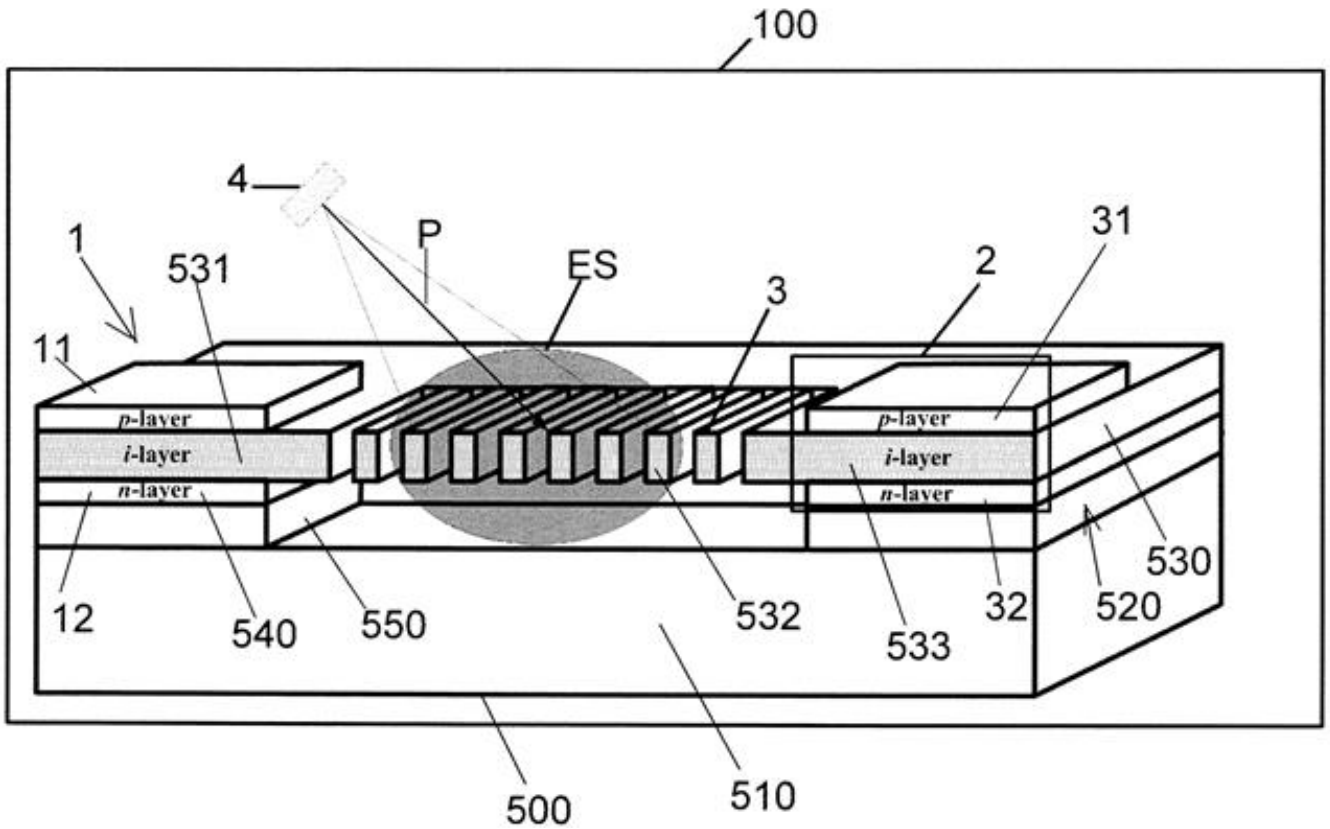
SME 11-50,University,R&D Institution,SME <10,>500 MNE,251-500,SME 51-250,>500

Type of Partnership Considered

License agreement
Research cooperation agreement

Attachments

14029_figure-TO.jpg



Application of pseudo-satellites in engineering measurements

Summary

A university from North-East of Poland has developed a system supporting GPS measurements by using terrestrial transmitters (pseudo-satellites). Advantage of this system is the ability to measure GPS in places out of reach, with poor visibility of the celestial sphere, as well as improvement of labour productivity by reducing measurement time and eliminating part of additional classical measurements. The university is interested in research cooperation agreement.

Creation Date 25 November 2016
Last Update 16 December 2016
Reference TOPL20161122003

Details

Description

The university was founded on 1 September 1999 in Olsztyn, Poland. At first, in 1999, there were 12 faculties, 32 branches of study, and 24.500 students. Now there are over 27.000 students that are educated at 17 faculties, and 65 branches of study, within either full-time or part-time studies. Additionally, there are also 600 doctoral candidates, and 1500 post-graduate students. Department of geodesy provides a wide range of research from the use of GPS, satellite observations up to geodetic network adjustment.

Using GPS measurements in engineering has increased work pace and reduced its costs. Satellite measurements provide sufficient accuracy of determining horizontal components (up to a few millimeters), however height measurement is burdened with an error several times bigger which often prevents the use of GPS system in precise geodetic measurements. Necessity of performing measurements at "open" sky is also a limitation. Obstacles in the form of buildings, trees etc. hamper the quality of designating position and often make it impossible to perform the measurement.
The method developed by scientists of the department can be a solution to this problem. Standard GPS observations supported by pseudo-satellites can eliminate disadvantages associated with poor availability of satellites without need for additional conventional measurements and ensure the required accuracy in comparable time to the time of measurement without obstacles.

The university looks for research cooperation agreement on the further development of this technology (with the construction of its terrestrial GPS transmitter).

Advantages and Innovations

Pseudo-satellites are devices that send the same signal as the GPS satellites placed on the ground with known coordinates. The idea of using GPS receivers anywhere it was so far not possible (even inside buildings) is a significant innovation in the field of geodetic GPS

measurements. The method may be used in measurement engineering, study of displacements and deformations in building early warning systems about the risks associated with different engineering designs.

Stage of Development

Under development/lab tested

IPR Status

Secret Know-how

Profile Origin

Private (in-house) research

Keywords

Technology

02008004	Railway Transport
02008005	Road Transport
02009018	Measurement devices
02011004	Satellite Navigation Systems
09001009	Sensor Technology related to measurements

Market

01005002	Satellite ground (and others) equipment
09001007	Other transportation
09007004	Engineering and consulting services related to construction

NACE

F.43.9.9	Other specialised construction activities n.e.c.
P.85.4.2	Tertiary education

Network Contact

Issuing Partner

ASTER - SOCIETA CONSORTILE PER AZIONI

Contact Person

Giulia Basilici

Phone Number

+39 51 6398099

Email

giulia.basilici@aster.it

Open for EOI : Yes

Dissemination

Send to Sector Group

Sustainable Construction

Client

Type and Size of Organisation Behind the Profile

University

Year Established

0

Already Engaged in Trans-National Cooperation

No.

Languages Spoken

English
Polish

Client Country

Poland

Partner Sought

Type and Role of Partner Sought

The university is looking for research cooperation on the use of a system consisting of one or more pseudo-satellites for measurements in difficult terrain. This means that the partner sought can be a research unit or a company dealing with geodetic measurements.

Type of Partnership Considered

Research cooperation agreement

Attachments

Biodegradable materials with improved thermal resistance and acoustic insulation properties

Summary

A Spanish technological centre expert in polymeric materials processing offers their know-how in the development of bio-fibres with improved thermal properties to produce 3D-fibre formed parts that can be applied in acoustic and thermal insulation. They look for partners for a technical and/or research cooperation agreement, to adapt the materials to specific requirements and/or develop new materials for new applications.

Creation Date	24 May 2016
Last Update	27 July 2017
Expiration Date	23 January 2018
Reference	TOES20160524001

Details

Description

Currently in all industrial sectors there is an increasing focus on environmental impact, particularly at the end of service life. With this aim, most of the companies look for alternatives to traditional plastic components. Among them, it is highlighted the automotive industry that looks for an alternative to plastic textile components.

Researchers focus on the development of textiles from fibres made of polylactic acid (PLA) derivatives as a substitute for the conventional polyester fibres. PLA is a biodegradable thermoplastic polymer that comes from renewable sources such as corn starch or sugar cane.

The main limitation of conventional PLA is the thermal resistance: PLA softens at a temperature around 52ºC, which limits its use in applications that require temperature resistance at pressure and conditions of environmental and chemical stress.

A Spanish Technological Centre with broad experience in polymeric materials processing and involved in many R&D projects related to modification of polymer properties, has developed a compound from PLA fibers that is able to fulfil the requirements for automotive interior applications, including aspects such as thermal resistance, fogging, odour emissions, VOCs and antimicrobial resistance.

The PLA blend formulation and the processing conditions are key factors that determine the performance of the materials. It has been proved as possible to increase the softening temperature from 52ºC to 102ºC, without compromising the viscosity of the material, which can then be processed by extrusion melt spinning in order to obtain the fibers.

These fibers can be successfully converted into fabrics and non-woven samples in order to obtain a final prototype of a moulded door panel. Two non-woven layers and a woven fabric are

combined into a composite consisting of 100% bio-based material (See attached picture).

These results were obtained in the framework of the BIOFIBROCAR project, funded by the 7th European Framework Programme, in which the centre explored the feasibility of substituting the polyester and polypropylene (PP) fibres then applied in car interiors, by PLA-based fibres.

The centre offers the know-how in the development of fibres with improved thermal properties in order to combine it with new technologies producing 3D-fibre formed parts to be applied in acoustic and thermal insulation.

They are interested in collaborations with users of these acoustic and thermal insulations in any sector, through a technical cooperation agreement, in which the centre can adapt the materials to the specific requirements of the application.

On the other hand they would also like to be contacted by potential partners interested in a joined development of new materials for new applications, through a research cooperation agreement.

Advantages and Innovations

- The material is environmentally friendly, as it is biodegradable.
- The softening temperature of the material has been increased from 57ºC to 102ºC without affecting the viscosity of the material, so it can then be processed by extrusion melt spinning in order to obtain fibers.
- The material can be processed by standard equipment of extrusion.

Stage of Development

Available for demonstration

IPR Status

Secret Know-how

Profile Origin

Other EU programme

Keywords

Technology

02006001	Materials, components and systems for construction
02007014	Plastics, Polymers
02009001	Design of Vehicles
03004008	Plastics and Rubber related to Chemical Technology
03005007	Textile fibres

Market

08001001	Plastic fabricators
08001006	Processes for working with plastics
08001018	Polymer (plastics) materials
08004002	Chemical and solid material recycling

09001004	Mail and package shipment

NACE

C.20.1.6	Manufacture of plastics in primary forms
C.22.2.1	Manufacture of plastic plates, sheets, tubes and profiles

Network Contact

Issuing Partner

ASTER - SOCIETA CONSORTILE PER AZIONI

Contact Person

Giulia Basilici

Phone Number

+39 51 6398099

Email

giulia.basilici@aster.it

Open for EOI : Yes

Dissemination

Send to Sector Group

Materials

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

1990

Turnover

1 - 10M

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
Spanish

Client Country

Spain

Partner Sought

Type and Role of Partner Sought

The centre would like to collaborate with users (companies, technology centres or universities) from any sector that requires acoustic and thermal insulations. The partner may indicate the specific needs of the application and the Spanish centre will adapt the materials for an appropriate use. A technical cooperation agreement will be established.

On the other hand the centre would also like to be contacted by potential partners (companies, technology centres or universities) that need the developed know-how to obtain new materials to be used in different applications. A research cooperation agreement will be established.

Type and Size of Partner Sought

SME 11-50,University,R&D Institution,SME <10,>500 MNE,251-500,SME 51-250,>500

Type of Partnership Considered

Technical cooperation agreement
Research cooperation agreement

Attachments

PICTURE.jpg



Flexible sound absorbing spacer fabric offered for functional and esthetic installations

Summary

German SME in the textile sector has developed an esthetic solution for sound absorbing room installations. The installation is 3D-capable and can be installed in any shape desired. The company is now looking for partners preferably in Austria, Switzerland, France, Scandinavia and Benelux who want to further set up a textile module series with the corresponding tensioning technique. A commercial agreement with technical assistance is sought.

Creation Date	07 December 2016
Last Update	23 December 2016
Expiration Date	23 December 2017
Reference	TODE20161117001

Details

Description

This German SME was founded in 1966 in Southern Germany. In the textile sector the company has several fields of activity. Mainly it serves different markets with its innovative warp knitted fabrics. For example flame retardant stretch fabric for exhibitions and spacer textiles for orthopedic appliances.
The beginnings of the company were as classical warp knitting manufacturer, today, the company offers customized solutions for diverse technical applications. In order to remain a market leader, the company has deep R&D activities and cooperates with textile institutes and is already engaged in trans-national cooperation.
In cooperation with a university of design they have developed a textile composite material with excellent sound absorbing and bi-elastic properties; until today, a unique combination on the market. The task for this project has been to reach reduced hall reflections and reverberations for a conference room of the university by developing an esthetic art installation boosting a positive room atmosphere. The result was a so called 3D textile which is basically made of elastic spacer fabric layers bonded through a special foam coating. The textile also shows up with an in-house developed flame retardant technology for textiles. A prototype of the fabric is available. The company delivers the fabric as rolled material and is now looking for further processing companies for a commercial agreement with technical assistance. Either interior outfitters and building equippers or interior designers with the focus on acoustic room solutions are sought. The task is to develop textile module series with the corresponding tensioning technique and offer the new product to existing customers. These could be smaller interior design studios for example. In order to serve public buildings and depending on the final regional markets, the applicable fire protection certification should be envisaged. Also companies could adopt the textile to own needs, offer customized products or others.
The desired outcome of the international partnership is the development of a textile module series which then can be offered to interior designer, interior outfitters of public buildings like theaters, museums, administrative buildings and others.

At this stage, the fabrics are available in white/grey colour, but technically dyeing and printings are possible. There are many applications to be thought of, for example, in train stations, museums, theaters and conference halls; but also in staircases, offices, luxury private or business buildings with disturbing noise and reverberation levels. The product is a high priced product and has to be established in high price segments only.

Advantages and Innovations

The innovation shows up with a new combination of bi-elasticity, sound absorbing and flame retardant properties. By applying tensioning techniques of the fabric, it offers new possibilities of 3D-like room installations with esthetic demands and diverse flexible shapes. Reliable sound absorbing proof through field tests and in a professional impedance tube. Significant reverberation reduction has been achieved.
Until now, sound absorbing materials for room installations are commonly made of solid materials and thus only available in flat surfaces. These are mounted either on the walls or on the ceiling.

Stage of Development

Prototype available for demonstration

Comments Regarding Stage of Development

Within a project with a university of interior design, a room installation has been realized already

IPR Status

Secret Know-how

Comment Regarding IPR status

Secret know-how on innovative Composite material

Profile Origin

Private (in-house) research

Keywords

Technology

02006004	Installations related to construction (energy, lighting, …)
02007018	Advanced Textile Materials
03005004	Finisher related to Textiles Technology
03005009	Woven technical textiles for industrial applications

Market

08001009	Speciality/performance materials: producers and fabricators
09004002	Office furniture and other professional furnishings
09004003	Textiles (synthetic and natural)

NACE

C.13.3.0	Finishing of textiles

Network Contact

Issuing Partner

ASTER - SOCIETA CONSORTILE PER AZIONI

Contact Person

Giulia Basilici

Phone Number

+39 51 6398099

Email

giulia.basilici@aster.it

Open for EOI : Yes

Dissemination

Send to Sector Group

Textile and Fashion

Client

Type and Size of Organisation Behind the Profile

Industry SME 11-49

Year Established

1966

Turnover

10 - 20M

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
German
Spanish

Client Country

Germany

Partner Sought

Type and Role of Partner Sought

Type of Partner: Industrial partner
Activity of Partner: Interior outfitter of for example public spaces or other interiors, building equipper or provider of acoustic solutions for interiors)
Role of Partner: development of a textile module series in order to adapt the textile into new application fields; adaption of the textile into own needs, customized products or others. For example sound absorbing textiles within a museum modernization.

Minimum Technical Specification or Expertise Needed:
Expertise with acoustic solutions for interiors could be of advantage but not necessary. Also contacts to or own industrial sewing capacities of technical textiles; e.g. Manufacturer of curtain walls. Existing customers are of advantage.

Type and Size of Partner Sought

SME 11-50,>500 MNE,251-500,SME 51-250,>500

Type of Partnership Considered

Commercial agreement with technical assistance

Attachments

Sound absorbing fabrics installation works before tensioning.jpg



Sound absorbing spacer fabrics with flexible layers.jpg



Sound absorbing fabrics room installation.jpg

