

flexible sensor solutions for new smart products in orthotics, rehabilitation, continuous and preventive healthcare and sports

Summary

Profile type	Company's country	POD reference
Technology offer	Austria	TOAT20230907005
Profile status	Type of partnership	Targeted countries
PUBLISHED	Research and development cooperation agreement Commercial agreement with technical assistance	• World
Contact Person	Term of validity	Last update
Rita ELSTE - TOMSONE	7 Sep 2023 6 Sep 2024	7 Sep 2023

General Information

Short summary

An Austrian start-up developed a technology to permanently integrate stretchable sensor grids into any 3D shaped and/or soft surface together with a cloud data management system certified for medical products. In this way, pressure, temperature, humidity and strain sensors can be freely placed on textile, foam and 3d-printed devices. Manufacturers are sought for new product development (technical cooperation); research cooperation in funded projects also possible.

Full description

The integration of sensors in products that are used in close contact with the human body in daily life opens up many new opportunities, especially in medical and care technology. In orthotics, the fit and functionality of orthotic devices can be verified and optimized. Wounds can be prevented by measuring the pressure distribution in diabetic insoles. In care, pressure and temperature sensors can be implemented in seating devices, mattresses etc. Also in sports, sensors can prevent injuries, track activity and assist in performance increase.

Such smart wearables already exist on the market, but they are often not applicable in daily life (only suitable for laboratory measurements, at the doctor's office etc.) or cannot be individually adapted for the respective end customer. The data management of the existing solutions can also not be individually adapted to different use cases.

The Austrian start-up (university spin-off) succeeded in developing an extremely flexible sensor solution consisting of a stretchable sensor grid that can be permanently integrated in any 3D shaped surface and used in daily life and an associated data management system that individually records, manages, analyses and visualizes the data.

The patent-pending sensor grid consists of flexible sensor points with the possibility to mount pressure and temperature sensors and stretchable conductive tracks that are integrated into a flexible silicone matrix. The grid is CAD designed for the specific application (individual placement of the sensors and integration into the plastic). It enables good mechanical connection between hard electronics and soft or stretchable materials and achieves a perfect fit. The grid can be customized for each end user (insole, prosthesis, etc.). However, it is also possible to produce only 3-4 variants that can cover all end customers.

The cloud data management system is based on a back-end provider certified for medical products. It offers the modules "designer" (for the individual design of the sensor grid), "portal" (user and device management, data protection settings) and "client" for visualization and analysis of the data. The data management system can be individually designed to the purpose of the smart product.

The sensor grid solution with pressure and temperature sensors is already available on the market in sports insoles for performance measurements. In the medical field, pilot projects with well-known customers in Austria and Europe are already underway (e.g. measuring the pressure distribution in diabetic insoles to prevent wounds and amputations). In addition, sensor grids with humidity and strain sensors are currently developed for detection of sweat, incontinence etc. Series production of the grids will be ready by the end of 2023. The company is currently doing ISO13485 certification (aim for certification is mid-2024).

Some technical details:

- sensor grid is 1 mm thin
- fully embedded in elastomer
- up to 64 sensors can be individually placed on an area of 550 x 400 mm
- pressure and temperature sensors can be mixed in one grid
- wireless data transfer via Bluetooth LE
- rechargeable battery supply; Qi wireless charging possible

The Austrian start-up is looking for manufacturers in the fields of orthotics and prosthetics, healthcare and sports interested in bringing new products with sensor technology to market (technical cooperation). It is also open to cooperations with universities and R&D organizations for development of new applications in the framework of funded European projects (research cooperation).

Advantages and innovations

The Austrian company assists clients in the product design/development and offers them a custom-made sensor solution consisting of a sensor grid and data management system. It supports from design to operation and provides a fully digital workflow. Using the technology, development time and risk can be greatly reduced.

The sensor grid can be permanently integrated in any 3D shaped surface. The technology aims to be no restricted heavy measurement tool, but a lightweight easy adaptable sensor system that can accompany people on a daily basis. This allows remote monitoring which opens up opportunities in preventive healthcare. For example, the wearing comfort and adherence of prostheses, orthoses, insoles, etc. can be optimized or it can be applied to support home care or telemedicine.

Further advantages:

- very fast way to develop smart wearables: first functional prototype ready in less than 3 months
- the sensor integration know-how saves 80% of product development costs
- sensor technology can be easily combined with existing CAD/CAM technology
- sensor grids can be customized for each end user
- individual mass production: grids are produced similar to 3D printing
- sustainable production: produced what and when needed; electronics are reusable
- integration into different materials possible (3D printing, textile, foam,...)
- data management is certified for medical products and tailored to clients needs
- measured data open up new digital business models

Technical specification or expertise sought

Stage of development

Already on the market

IPR Status

IPR applied but not yet granted

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**
- **Goal 12: Responsible Consumption and Production**
- **Goal 3: Good Health and Well-being**

Partner Sought

Expected role of the partner

Specific area of activity of the partner sought:

The Austrian start-up is looking for manufacturers in the fields of:

- orthopedics (manufacturers of prosthetics, orthotics, insoles, corsets, shoes, etc.)
- care (manufacturers of wheelchairs, bed inserts, pillows, digital care products,...)
- sports (insoles for various sports, gloves with sensor technology,...)

These manufacturers should be interested in bringing a new product with sensor technology to market (preferred) or in validating their products with the company's sensor technology.

The Austrian start-up is also willing to collaborate with other start-ups aiming to bring a new wearable device and associated digital services to market.

The Austrian company is also open to cooperations with universities and R&D organizations for development of new applications.

Task to be performed by the partner:

Technical cooperation agreement: with manufacturers from the fields mentioned above wanting to develop a smart product. The Austrian company assists in the product design and development, builds first functional prototypes and offers a custom-made sensor solution with data management system.

It is also possible to supply only the sensor grid for the development and integrate the data management into existing software solutions. The Austrian company can then also act as a supplier of the sensor grids for the series production of the finished product.

Research cooperation agreement: the Austrian start-up is open to participate in funded projects with universities or R&D institutions either as third party supplier of sensor technology or as project partner in a consortium.

Type of partnership

Research and development cooperation agreement

Commercial agreement with technical assistance

Type and size of the partner

- **SME 50 - 249**
- **R&D Institution**
- **SME 11-49**
- **SME <=10**
- **University**
- **Big company**

Dissemination

Technology keywords

- **06001020 - Physiotherapy, Orthopaedic Technology**
- **06001023 - Medical Furniture**
- **01004001 - Applications for Health**
- **06005002 - Sensors & Wireless products**
- **09001009 - Sensor Technology related to measurements**

Targeted countries

- **World**

Market keywords

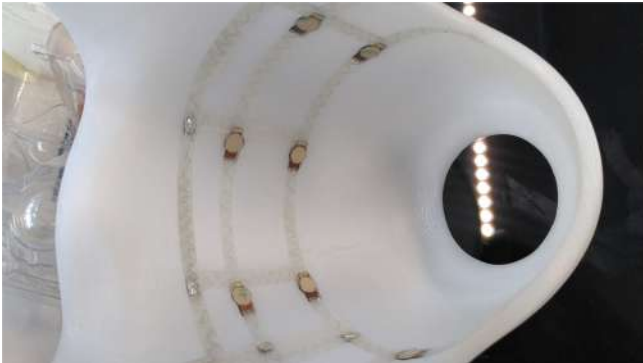
- **07001004 - Sporting goods, hobby equipment and athletics clothes**
- **05005015 - Orthopaedics**
- **05010003 - Patient rehabilitation & training**
- **02007012 - Medical/health software**
- **05005016 - Environmental Medicine, Social Medicine, Sports Medicine**

Sector groups involved

- **Health**

Media

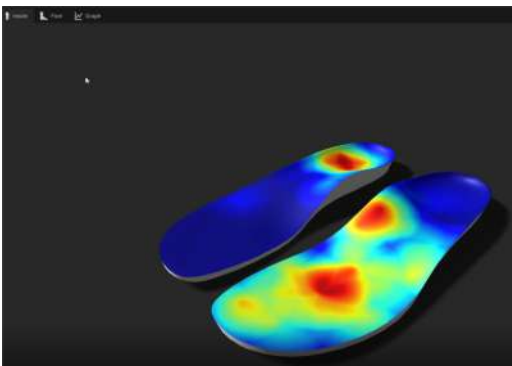
Images



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