

Method of measuring the foot pressure on the ground

Who are we?

Łukasiewicz – Institute of Microelectronics and Photonics, based in Poland (Warsaw), is a part of Łukasiewicz Research Network – one of the largest European organizations for applied research. Łukasiewicz – IMiF operates under the formula Science is Business and its strategy is to play a central role in the innovation process towards R&D for industry and business. One of the areas of our activity is printed electronics which can be used for instance in designing systems and sensors for various types of applications or products such as diagnostic inserts or self-disinfecting keyboards etc.

Patent information

**Technology
readiness
level:**
8

Title: Method of measuring the foot pressure on the ground

Patent number: Pat.229486

Priority Date: 22.05.2013

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Owners: Łukasiewicz – IMiF, Uniwersytecki Szpital Ortopedyczno – Rehabilitacyjny w Zakopanem

Jurisdictions: Poland

Our patent presents a method of measuring the pressure of the foot on the ground, especially under conditions of physical human activity, such as walking, running or jumping. Measuring the pressure exerted by the foot on the ground under dynamic conditions makes it possible to get a good understanding of the mechanics of the foot's work and to assess the correctness of its structure. Analysis of the distribution of the pressure exerted by the foot on the ground under dynamic conditions enables advanced studies of gait biomechanics and is of great importance in the evaluation and therapy of foot pathologies and postural defects. The pressure sensors are arranged in the diagnostic insole at appropriate measuring points, and the signal processing and transmission module (which has a relatively small weight – less than 100 g.), is placed on the outside of the shoe.



The potential behind the technology

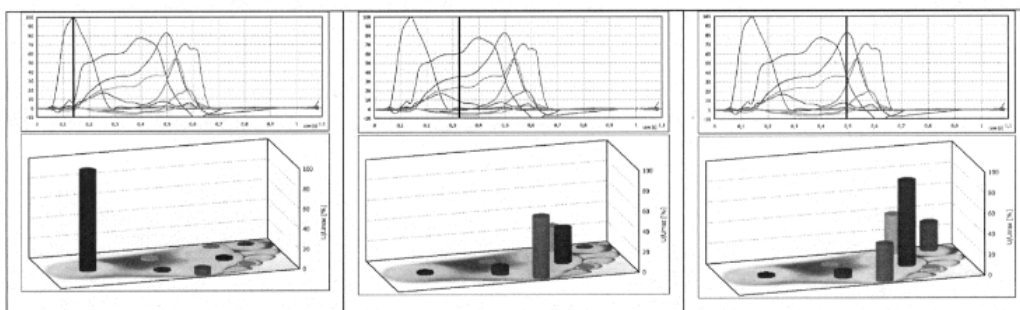
The analysis of loads exerted by different parts of the foot allows for the proper design of corrective insoles and the effective correction of foot issues, especially in the case of dangerous foot deformities, such as diabetic foot syndrome or deformities caused by rheumatic conditions. It provides extremely important information for diagnosing and selecting the optimal rehabilitation process. The essence of our method is that the electrical signals from eight pressure sensors distributed at selected points of the foot designated as measuring critical zones are fed to the signal processing and transmission module and recorded in a recording device equipped with a radio signal receiver, while the transmission and recording of the signals from all eight pressure sensors are implemented simultaneously.

Technology Advantages

The sensors are made of a material with high strength and resistance to environmental factors. They operate within no more than 5% of the material's elastic range under the pressures exerted by walking and running individuals. As a result, the measuring insoles are calibrated during their construction and do not require further calibration during use. Simultaneous recording of signals from all eight sensors allows for concurrent tracking of how the signal rises and falls, proportional to the pressure, at each moment of the measurement process.

Application

The patent is part of a solution related to an insole for shoes. This is because it is closely related to the patent number Pat.225306 entitled 'Diagnostic insert for shoes'. Both patents give an opportunity to create an innovative diagnostic insert for shoes that can help diagnose foot pathologies and postural defects and decide on appropriate treatment and rehabilitation for patients.



Collaboration type

License agreement or sale agreement

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