

High-sensitivity single-sided pressure sensor with depth detection

From telemedicine to industrial applications, real-time tactile information

Overview

Social Challenges and Market Background

In telemedicine, the inability to perform palpation limits diagnostic accuracy. Conventional pressure sensors are costly, lack sufficient sensitivity, and cannot measure depth. As populations age and regional disparities in healthcare access grow, remote diagnostic tools with palpation capabilities are in high demand. The global tactile sensor market is projected to grow at a compound annual growth rate (CAGR) of over 10%.

Technology Overview

This technology features a single-sided wiring structure that achieves high sensitivity while reducing manufacturing costs to approximately one-tenth of conventional designs. It enables real-time measurement of pressure, depth, and viscosity, and its fingertip-mounted form factor allows seamless use in clinical or field settings. Applications extend from medical and healthcare to industrial inspection and product quality control.

Advantages Over Conventional Technology

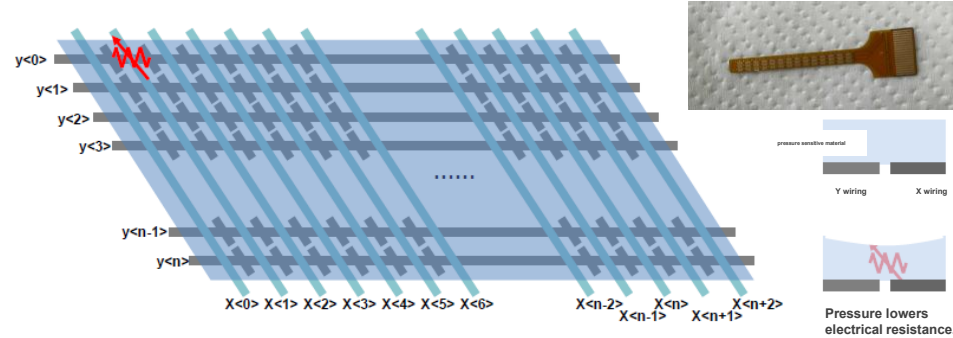
Feature	Conventional Design	This Technology
Wiring Structure	Double-sided (sandwich)	Single-sided, separable pressure-sensitive material
Cost	High	~1/10 of conventional
Sensitivity	Limited	High sensitivity (42-pixel high resolution)
Functionality	Pressure only	Pressure + Depth + Viscosity

Product Application

- Telemedicine
- Self-care by palpation
- Utilization of content containing tactile information (electronic medical records and education)
- Surface pressure sensor

IP Data

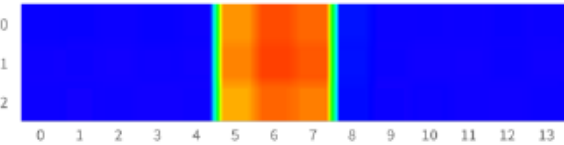
IP No. : JP2023-146043, PCT/JP2024/031702
 Inventor : IKEBE Masayuki
 Admin No. : HK24-002



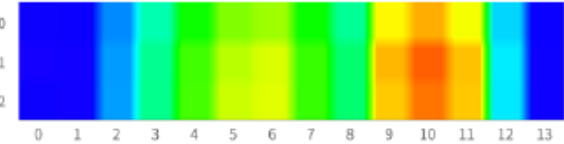
Example of sensor structure and photograph [1].

Pressure measurement

Rigid body



Human subcutaneous tissue



Pressure distribution is measured with a physical indenter using a pressure sensor. Asker hardness FP puff discrimination is also possible [1].

Related Works

- [1] FY 2023 JST New Technology Briefing, Hokkaido University, October 5, 2023
https://shingi.jst.go.jp/list/list_2023/2023_hokudai.html#20231005X-008
- [2] Hokkaido University Press Release, January 10, 2024
<https://www.hokudai.ac.jp/news/2024/01/5g.html>

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