Contact Lens with Transparent Biosensor Array

Published date: April 18, 2017

Technology description

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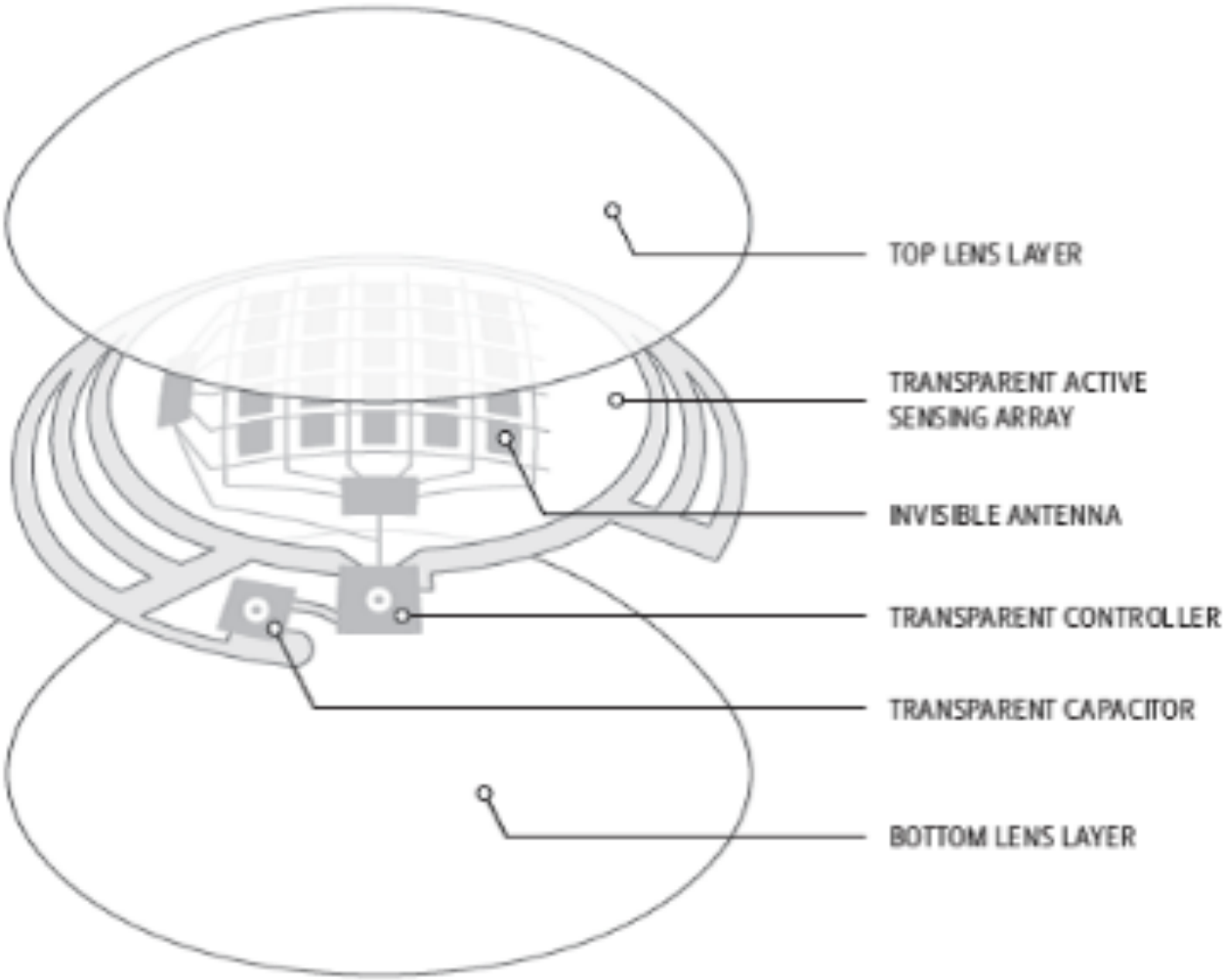
This technology describes an array of field effect transistors (FETs) that are functionalized to detect biological markers with high sensitivity and specificity. The FET sensors are made of transparent materials processed at relatively low temperatures, allowing for the sensors to be deposited on clear and curved surfaces, such as a contact lens, to enable non-invasive monitoring of numerous compounds in the tear fluid. Without obstructing vision, this technology could improve the monitoring and treatment of many conditions and diseases through improved detection of relevant biomarkers.

Background of Invention

The management and treatment of many health problems requires routine monitoring of target compounds. For example, management of Type 1 diabetes requires regular monitoring of blood glucose. Rather than measuring glucose directly in the blood, field effect transistors (FETs) can be functionalized to work as a sensing transducer to monitor glucose levels in tear fluid. This would allow diabetics to monitor glucose levels more continuously and non-invasively, improving management and outcomes. Further, FETs can be functionalized to non-invasively detect a wide variety of other marker compounds in tear fluid.


TOP LENS LAYER
TRANSPARENT ACTIVE SENSING ARRAY
INVISIBLE ANTENNA
TRANSPARENT CONTROLLER
TRANSPARENT CAPACITOR
BOTTOM LENS LAYER

Application area

Glucose monitoring
Disease treatment
Health management

Advantages

Transparent
Non-invasive
Continuous monitoring

Institution

Oregon State University

Inventors

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