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Methods to Produce a Multi-Microchannel Flow-through Device

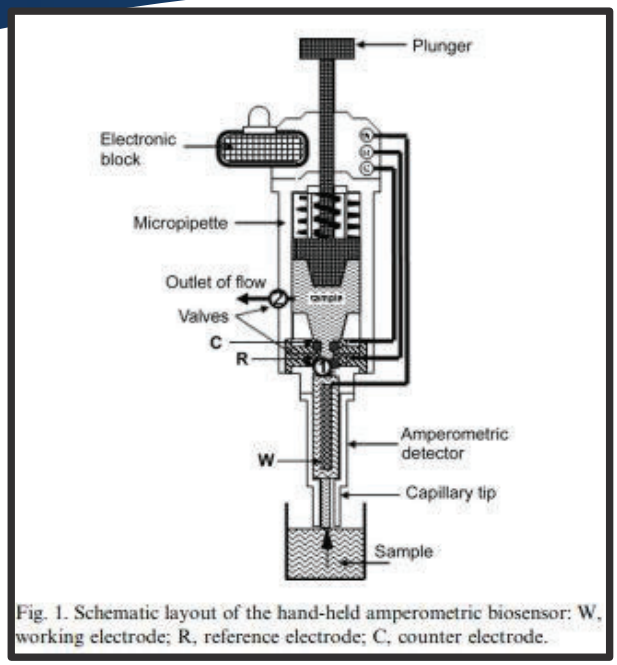

Fig. 1. Schematic layout of the hand-held amperometric biosensor: W, working electrode; R, reference electrode; C, counter electrode.

Challenge

Currently, conventional flow-through microfluidic technologies have a single microchannel with special inner geometry that is individually wired and used in microchip technology. So far, there is a large uncertainty in the test results because of variations in the properties of individual microchannels, i.e., there is no reproducibility of test results.

Current limitations with current flow-through technologies include: complexity, low production rate, and high cost of known methods for manufacturing microporous and microchannel materials with a desired structure.

Solution

The multi-microchannel elements produced in the method of this invention, and the applications for such elements, have a number of benefits over conventional flow-through microfluidic technologies.

Benefits and Features

- Increased speed of testing or analysis as well as increased assay sensitivity.
- Uses a miniaturization as a prospect of integration of all steps of an analytical process into a single device.
- 3D network of channels and electronic control circuitry.

Market Potential / Applications

This invention has a variety of applications in the life sciences, pharmaceutical industry, industrial applications, and biomedicine such as drug design, delivery, and detection, and diagnostic devices.

Developments and Licensing Status

Status: Available

Commercial sponsor sought? Yes

Patent Status

US Patent Issued US 9,404.882 B2

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Keywords: microchannel, micromixers, microfluidic system

Relevant Publication:

Ivnitski et al., “Non-Invasive Electrochemical Hand-Held Biosensor as Diagnostic Indicator of Dental Diseases' Electrochem. Commun.5, pp. 225-229 (2003).

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