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(54) Title: MICROFLUIDIC INTEGRATED CMOS BASED IMPEDANCE ARRAY BIOSENSOR

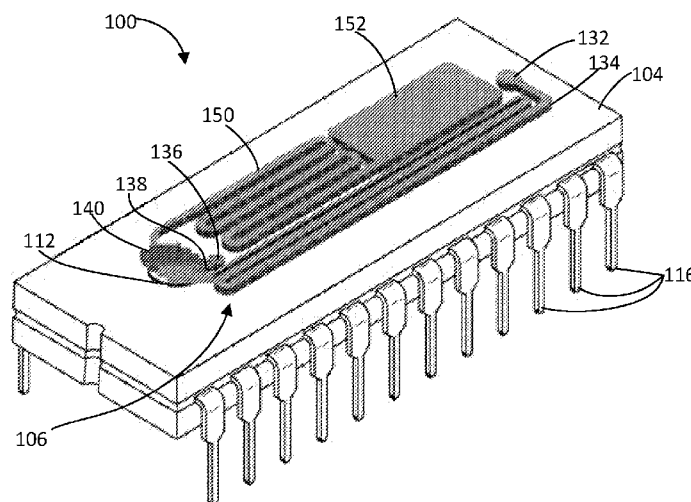


FIG. 1A

(57) Abstract: A point-of-care diagnostic device configured to measure characteristics of a biological sample. The point-of-care device includes an electronic component package and a complementary metal-oxide-semiconductor (CMOS) biosensor formed on the electronic component package. The CMOS biosensor includes a fluidic system, an electrode array in fluid communication with the fluidic system, and an impedance detection circuit in electrical communication with the electrode detection circuit. The fluidic system is formed on the electronic component package and is configured to transport fluid. The electrode array in fluid communication with the fluidic system and includes a plurality of electrode pairs. The electrode array having a surface coating with an antibody. The impedance detection circuit is in electrical communication with the electrode array and is configured to detect an electrical impedance change caused by a binding of the biological sample to the antibody on each of the electrode pairs.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2017/0326552 A1 (IMEC VZW) 16 November 2017 (16.11.2017), entire document, especially Fig 1, Fig 4, para [0028], para [0090], para [0104], para [0110]-[0111], para [0120], para [0133]-[0136], para [0143]-[0149], para [0157], para [0188]-[0192]	1-21
Y	US 2022/0291211 A1 (University of Utah Research Foundation) 15 September 2022 (15.09.2022), entire document, especially Fig 13, para [0003], para [0054], para [0059]-[0080], para [0130]-[0132], para [0137], para [0146]-[0150], para [0158]	1-21
Y	US 2014/0162308 A1 (Texas State University) 12 June 2014 (12.06.2014), entire document, especially para [0002], para [0008], para [0063]	4
Y	US 2013/0271811 A1 (Lam et al.) 17 October 2013 (17.10.2013), entire document, especially Fig 5, para [0046]-[0047], para [0084]	5
Y	US 2015/0060284 A1 (Duke University) 5 March 2015 (05.03.2015), entire document, especially para [0035]-[0036], para [0042]-[0047]	6-7
Y	US 2019/0039060 A1 (The Board of Trustees of the Leland Stanford Junior University) 7 February 2019 (07.02.2019), entire document, especially Fig 3, para [0032], para [0037]-[0044], para [0047]-[0048], para [0059], para [0067]	9, 19-20
Y	WO 2022/109225 A1 (The Trustees of Princeton University) 27 May 2022 (27.05.2022), entire document, especially Fig 7, para [0003], para [0068]-[0070], para [0104]-[0108], para [0133]	10, 12, 21

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	✓ Kweon et al. A CMOS low-power polar demodulator for electrical bioimpedance spectroscopy using adaptive self-sampling schemes. 2016 IEEE Biomedical Circuits and Systems Conference, 17 October 2016 [online]. Retrieved from the Internet <URL: https://ieeexplore.ieee.org/abstract/document/7833787 >, entire document, especially Abstract	13
Y	US 6,443,179 B1 (Benavides et al.) 3 September 2002 (03.09.2002), entire document, especially col 1, ln 23-45; col 11, ln 52-58; col 12, ln 57-64; col 15, ln 61-65; col 16, ln 18-24	17
A	US 2022/0065807 A1 (California Institute of Technology) 3 March 2022 (03.03.2022), entire document	1-21
A	US 10,718,732 B2 (The Trustees of Columbia University in the City of New York) 21 July 2020 (21.07.2020), entire document	1-21