

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
06 September 2024 (06.09.2024)



(10) International Publication Number
WO 2024/181914 A1

- (51) **International Patent Classification:**
A61B 5/145 (2006.01) *B01L 3/00* (2006.01)
- (21) **International Application Number:**
PCT/SG2024/050086
- (22) **International Filing Date:**
20 February 2024 (20.02.2024)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
10202300536X 28 February 2023 (28.02.2023) SG
- (71) **Applicant: AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis North Tower, Singapore 138632 (SG).
- (72) **Inventors: CHEN, Yu;** c/o Institute of Microelectronics, 2 Fusionopolis Way, #08-02, Innovis, Singapore 138634 (SG). **YAP, Ven Wee, James;** c/o Institute of Microelectronics, 2 Fusionopolis Way, #08-02, Innovis, Singapore 138634 (SG). **LIM, Ruiqi;** c/o Institute of Microelectronics, 2 Fusionopolis Way, #08-02, Innovis, Singapore 138634 (SG). **CHENG, Ming-Yuan;** c/o Institute of Microelectronics, 2 Fusionopolis Way, #08-02, Innovis, Singapore 138634 (SG).
- (74) **Agent: AMICA LAW LLC;** 77 Robinson Road, #22-01 Robinson 77, Singapore 068896 (SG).
- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,

DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship* (Rule 4.17(iv))

Published:

— *with international search report* (Art. 21(3))

(54) **Title:** MICROFLUIDIC DEVICE AND METHOD FOR MONITORING OR MEASURING ONE OR MORE PARAMETERS OF A FLUID

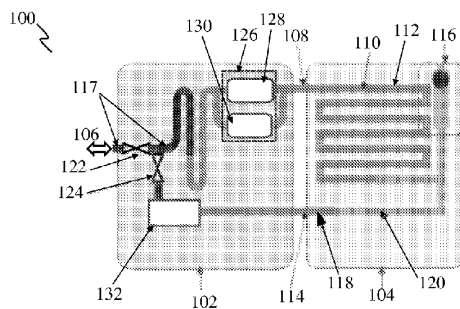


FIG. 1

(57) **Abstract:** The invention is to provide a microfluidic device including a fluid control module configured to be detachably coupled to an external tube, and a replaceable cartridge detachably coupled to the fluid control module. The replaceable cartridge may include a first port arranged in fluidic communication with the fluid control module, a microchannel in fluidic communication with the first port, wherein the fluid control module is configured to manipulate a fluid received from the external tube and/or one or more reagent solutions from the microchannel and subsequently dispose the same as a waste fluid, a second port arranged in fluidic communication with the fluid control module for the waste fluid to flow into the microchannel, and a pressure release valve in fluidic communication with the microchannel, wherein the pressure release valve is configured to regulate an air gap within the microchannel to keep each of the preloaded one or more reagent solutions in the microchannel spaced apart from the waste fluid received from the fluid control module. The invention also provides a method for monitoring or measuring one or more parameters of the fluid.

WO 2024/181914 A1