

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
15 July 2021 (15.07.2021)



(10) International Publication Number
WO 2021/142044 A1

(51) International Patent Classification:
B01L 3/50 (2006.01) *B81C 1/00* (2006.01)
B01J 19/00 (2006.01)

(21) International Application Number:
PCT/US2021/012384

(22) International Filing Date:
06 January 2021 (06.01.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/957,536 06 January 2020 (06.01.2020) US
62/989,895 16 March 2020 (16.03.2020) US

(71) Applicant: **BISU, INC.** [US/US]; 919 N Market St., Ste
425, Wilmington, DE 19801-3014 (US).

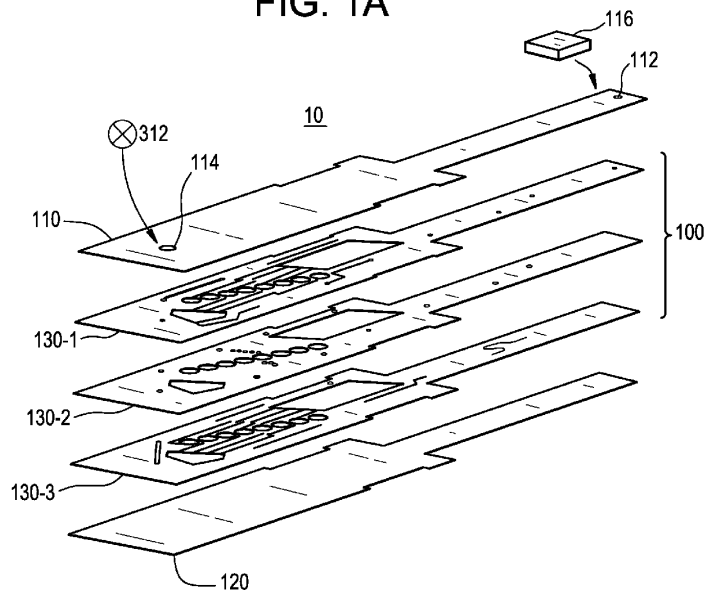
(72) Inventors: **SUZUKI, Gen**; 5-15-20 Hase, Kamakura,
Kanagawa 248 0016 (JP). **BULA, Wojciech**; River City
21 East Towers II #2202, 2-1-2 Tsukuda, Chuo-ku, Tokyo
104-0051 (JP). **SOMMER, Peter, Christian**; Royal Akasa-
ka Saloon # 509, 1-5-20 Akasaka, Minato-ku, Tokyo
107-0051 (JP). **MAGGS, Daniel**; Hoei Sangubashi Man-
sions # 301, 4-55-9 Yoyogi, Shibuya-ku, Tokyo 151-0053
(JP).

(74) Agent: **HARRIS, Ronald, C.**; The Harris Firm, 922 N
Street, NW Suite 101, Washington, DC 20001 (US).

(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, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO,

(54) Title: MICROFLUIDIC SYSTEM, DEVICE AND METHOD

FIG. 1A



(57) Abstract: A microfluidic test system is disclosed. The system includes a test substrate including parallel channels and reaction chambers. The reaction chambers are adapted to accommodate optical transmittance, absorbance and reflectance testing. The movement of the fluid within the system is controlled and synchronized in real time with the optical measurements of the reagents and analytes within each individual reaction chamber. The optical testing of each reaction chamber is customized regarding the color and intensity of the source light. The system includes an easy-to-use applicator for the capture of the test fluid and a fully automated measurement and test system. The microfluidic test system may be incorporated into clothing or apparel such as in a diaper. A device and method are also disclosed.

[Continued on next page]

WO 2021/142044 A1

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, GH, GM, KE, LR, LS, MW, MZ, NA, RW, 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, 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:

- *as to the identity of the inventor (Rule 4.17(i))*
- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
- *of inventorship (Rule 4.17(iv))*

Published:

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