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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 February 2007 (15.02.2007)

PCT

(10) International Publication Number
WO 2007/019479 A3

(51) International Patent Classification:
F15C 1/06 (2006.01) *C12M 3/00* (2006.01)
C12M 1/36 (2006.01)

(21) International Application Number:
PCT/US2006/030824

(22) International Filing Date: 4 August 2006 (04.08.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/705,847 4 August 2005 (04.08.2005) US
60/813,428 13 June 2006 (13.06.2006) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

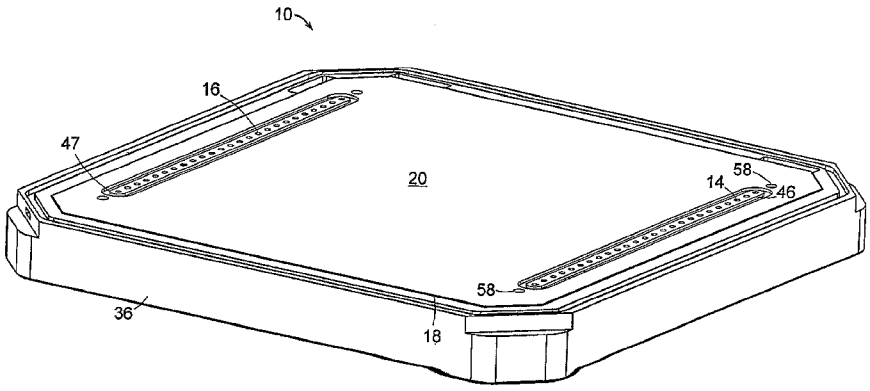
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
20 September 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MULTI-CHANNEL FLOW CELLS



(57) Abstract: A multi-channel flow cell can allow for reduced cross-contamination in sample loading and the ability to observe activity within the flow cell once the channels are loaded. A multi-channel flow cell includes a plurality of independently-addressable channels sandwiched between a two substrates. Each of the channels can be coated with a layer that facilitates support-binding of an analyte. Each of the channels terminates on one end in an inlet and on the other end in an outlet. A loading block having inlet ports that match the inlets of the channels can be mated to the inlets of the channels, and an outlet block can be mated to the outlets of the channels. Analytes can be introduced into the channels via the inlet ports of the loading block and are pulled through the channels by capillary action or by vacuum. Once analyte has been introduced into each of the channels, the loading and outlet blocks can be removed and the device turned over. Such a flow cell can be used for streamlining the process of reaction and interrogation of biochemical assays at the microfluidic level. Reagents can be introduced into each of the channels of the flow cell for chemical reactions therein, excess reagent being washed out through the channel outlets. Observation of optically-detectable moieties is then conducted. With such a flow cell optical labels associated with incorporation in a sequencing-by-synthesis reaction can be observed.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 06/30824

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) -F15C 1/06 C12M 1/36 3/00 (2007.1)
USPC -137/833
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)
USPC 137/833

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC 435/6, 435/283.1, 435/286.5, 435/288.4

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

WEST - PGPB,USPT,USOC,EPAB,JPAB; Dialog Classic Files 2,6,8, 94, 144, 315, 65, 118, 351, 35;
Search terms flow cell, channel, inlet and outlet port, adhesive, loading block, vacuum, glass, silicate, sapphire, polycarbonate, acrylic, plastic, epoxide, avidin, hybridizing, sequencing, etch, mold, wells

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,520,787 A (HANAGAN et al.) 28 May 1996 (28.05.1996), col 1, ln 54-56, col 3, ln 33-44, col 4, ln 4-14 and ln 42-55.	1-20
Y	US 6,911,345 B1 (QUAKE et al.) 28 June 2005 (28.06.2005), col 3, ln 36-43, col 8, ln 61 to col 9, ln 3, col 10, ln 7-34, col 18, ln 1-8, col 19, ln 33-48.	1-20
Y	US 6,540,961 B1 (ACKLEY et al.) 1 April 2003 (01.04.2003), figures 5A and 5B.	2-3, 11-12
Y	US 6,788,409 B1 (GOODWIN) 7 September 2004 (07.09.2004), col 2, ln 64 to col 3, ln 2.	2, 11
Y	US 5,644,395 A (FOLTA) 1 July 1997 (01.07.1997), col 6, ln 10-13.	4, 13
Y	US 6,649,348 B1 (BASS et al.) 18 November 2003 (18.11.2003), col 5, ln 21-27.	8, 16

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Date of the actual completion of the international search	Date of mailing of the international search report
28 March 2007 (28.03.2007)	10 JUL 2007
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2005)