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Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv))

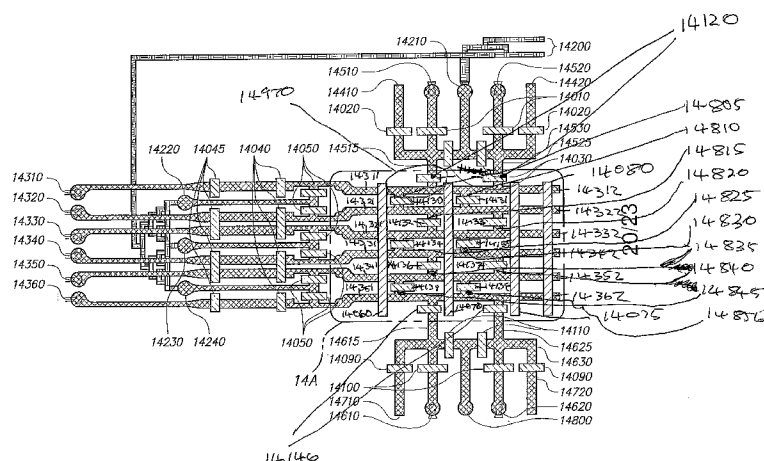
Published:

— with international search report

(88) Date of publication of the international search report:
12 July 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: MICROFLUIDIC ASSAY DEVICES AND METHODS



(57) Abstract: A microfluidic device adapted to perform many simultaneous binding assays including but not limited to immunological experiments, such as ELISA assays, with minimal cross-talk between primary and secondary antibodies.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/036365

A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N33/543 B01L3/00

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)

G01N B01L B01J

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

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

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/08799 A1 (FEBIT FERRARIUS BIOTECHNOLOGY [DE]; STAEHLER CORD FRIEDRICH [DE]; MUEL) 8 February 2001 (2001-02-08) page 19, line 23 - page 20, line 15; figures 14,15 page 16, line 29 page 3, lines 11-24 page 5, lines 5-15	1,4-6, 9-18, 30-40
X	DE 100 41 853 C1 (GMD GMBH [DE]) 28 February 2002 (2002-02-28)	1,2, 4-18, 30-40
Y	paragraphs [0006], [0009], [0039] - [0041]; figure 1 ----- -/--	3

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

25 January 2007

Date of mailing of the international search report

25/04/2007

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/036365

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/07889 A2 (CELLOMICS INC [US]; KAPUR RAVI [IN]; GIULIANO KENNETH [US]) 1 February 2001 (2001-02-01) page 37, line 25 - page 42, line 32; example 3 page 43, line 1 - page 47, line 2 page 49, lines 6-15 page 49, line 18 - page 53, line 11 page 16, line 29	1,2, 4-18, 30-40,45
X	US 2005/047967 A1 (CHUANG SWAY [TW] ET AL) 3 March 2005 (2005-03-03) paragraphs [0022] - [0025]; figure 1	1,2,4
Y	US 2005/129581 A1 (MCBRIDE LINCOLN [US] ET AL) 16 June 2005 (2005-06-16) cited in the application the whole document	3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/036365

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 41-44
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-18, 30-40, 45 (part.)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 41-44

Claims 41 to 43 relate to microfluidic devices suitable to perform a certain number of immunoassays in a given amount of time and claim 44 relate to a method of controlling specific microfluidic devices. No technical features could be identified in these claims which would give a hint as to how these results should be achieved. Thus present claims 41-44 relate to an apparatus or method respectively which is defined only by a given desired property or effect, these claims are therefore unclear (Article 6 PCT). This non-compliance with the substantive provisions is to such an extent, that no meaningful search for these claims was possible.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-18, 30-40, 45 (part.)

A microchip with a matrix of channels with microreactors and valves to switch fluid communications of columns and rows and a plurality of dedicated flushing channels addressable to switch between flushing columns and rows, solving the problem to flush reaction chambers independent of reagent delivery.

2. claims: Claims 19-29, 45 (part.)

A microfluidic chip comprising a plurality of reaction chambers configured to reduce crosstalk, the chambers having a volume of less than 5 nl per chamber and wherein immunoassay sensitivity and dynamic range have specific minimum values, solving the problem of further reducing antibody crosstalk.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/036365

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0108799	A1	08-02-2001	AT 309041 T 15-11-2005
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US 2005047967	A1	03-03-2005	NONE
US 2005129581	A1	16-06-2005	US 2005084421 A1 21-04-2005