

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
15 April 2010 (15.04.2010)

PCT

(10) International Publication Number  
WO 2010/041230 A3

- (51) **International Patent Classification:**  
*B01L 3/00* (2006.01) *G01N 33/543* (2006.01)  
*G01N 33/50* (2006.01)
- (21) **International Application Number:**  
PCT/IB2009/055206
- (22) **International Filing Date:**  
12 October 2009 (12.10.2009)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
61/104,514 10 October 2008 (10.10.2008) US
- (71) **Applicants (for all designated States except US):** CNRS-DAE [FR/FR]; 3 rue Michel Ange, F-75794 Paris Cedex 16 (FR). INSTITUT CURIE [FR/FR]; 26 rue d'Ulm, F-75248 Paris Cedex 05 (FR). UNIVERSITE PIERRE ET MARIE CURIE (PARIS 6) [FR/FR]; 4 place Jussieur, F-75252 Paris Cedex 05 (FR). UNIVERSITE PARIS SUD XI [FR/FR]; 11 rue Georges Clémenceau, F-91405 Orsay (FR).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** VIOVY, Jean-Louis [FR/FR]; 26 rue de l'Espérance, F-75013 Paris (FR). LE NEL, Anne [FR/FR].
- (74) **Agents:** TANTY, François et al.; Nony, 3, rue de Penthièvre, F-75008 Paris (FR).
- (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, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
- with international search report (Art. 21(3))
  - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- (88) **Date of publication of the international search report:**  
17 June 2010

(54) **Title:** MICROFLUIDIC INTEGRATED DEVICE FOR SAMPLE PROCESSING

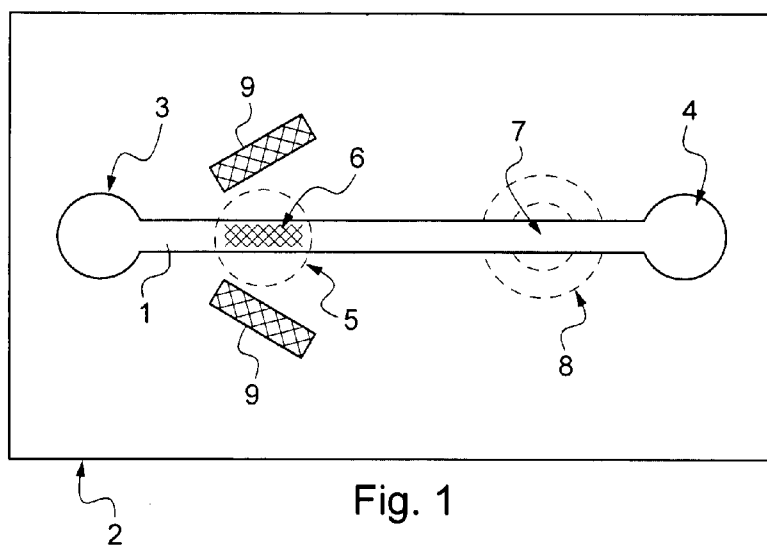


Fig. 1

(57) **Abstract:** An integrated microsystem (2), comprising: a microchannel (1), a field generator (9) to create a magnetic field in at least one first portion (5) of the microchannel having a direction substantially collinear with the direction of flow in the portion of the microchannel, the magnetic field also presenting a gradient, wherein the microsystem additionally comprises a detection area (7) in fluid connection with the microchannel. A method is also described in which magnetic microparticles are used to intersect with an analyte in the device.

WO 2010/041230 A3

**INTERNATIONAL SEARCH REPORT**

|   |
|---|
| International application No<br>PCT/IB2009/055206 |
|---|

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. B01L3/00 G01N33/50 G01N33/543  
 ADD.

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)  
 B01L G01N

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         | US 2003/044832 A1 (BLANKENSTEIN GERT [DE])<br>6 March 2003 (2003-03-06)<br>paragraphs [0008], [0056], [0061],<br>[0071], [0131], [0132], [0151],<br>[0174]; example 7                                      | 1-9,<br>11-19         |
| X         | US 2004/018611 A1 (WARD MICHAEL DENNIS<br>[US] ET AL) 29 January 2004 (2004-01-29)<br>paragraphs [0028], [0110], [0117],<br>[0165], [0249] - [0251], [0261], [0164]<br>- [0165]                            | 1-9                   |
| X         | WO 2008/094198 A2 (BIOSITE INC [US];<br>GREGORY DAVID M [US]; ANDERBERG JOSEPH<br>MICHAEL [US]) 7 August 2008 (2008-08-07)<br>paragraphs [0003], [0008], [0012],<br>[0046], [0085], [0104], [0121], [0145] | 1-15,17               |
|           | -/--   |                       |

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  | "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   |
| "E" earlier document but published on or after the international filing date  | "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  |
| "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) | "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. |
| "O" document referring to an oral disclosure, use, exhibition or other means  | "&" document member of the same patent family   |
| "P" document published prior to the international filing date but later than the priority date claimed  |   |

|  |  |
|--|--|
| Date of the actual completion of the international search<br><br>20 April 2010 | Date of mailing of the international search report<br><br>03/05/2010 |
|--|--|

|  |  |
|--|--|
| Name and mailing address of the ISA/<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016 | Authorized officer<br><br>Hoyal, Barnaby |
|--|--|

INTERNATIONAL SEARCH REPORT

International application No  
PCT/IB2009/055206

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |  |                       |
|--|--|-----------------------|
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
| X  | <p>WO 02/093125 A2 (HARVARD COLLEGE [US])<br/>21 November 2002 (2002-11-21)<br/>page 1, line 30 - page 2, line 20<br/>page 11, line 6 - page 12, line 20<br/>page 12, line 8 - page 12, line 19<br/>page 17, line 5 - page 17, line 30<br/>-----</p> | 1-19                  |
| X  | <p>US 2006/011552 A1 (UTSUNOMIYA NORIHIKO<br/>[JP]) 19 January 2006 (2006-01-19)<br/>paragraphs [0002], [0007] - [0015],<br/>[0031], [0037], [0038], [0066]<br/>-----</p>  | 1-9, 12,<br>13, 17    |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2009/055206

| Patent document cited in search report | A1 | Publication date | Patent family member(s) | Publication date |
|--|----|------------------|-------------------------|------------------|
| US 2003044832                          | A1 | 06-03-2003       | NONE                    |                  |
|  |    |                  |                         |                  |
| US 2004018611                          | A1 | 29-01-2004       | NONE                    |                  |
|  |    |                  |                         |                  |
| WO 2008094198                          | A2 | 07-08-2008       | CN 101495868 A          | 29-07-2009       |
|  |    |                  | EP 2049902 A2           | 22-04-2009       |
|  |    |                  |                         |                  |
| WO 02093125                            | A2 | 21-11-2002       | AU 2002308687 A1        | 25-11-2002       |
|  |    |                  |                         |                  |
| US 2006011552                          | A1 | 19-01-2006       | JP 2006010529 A         | 12-01-2006       |
|  |    |                  |                         |                  |