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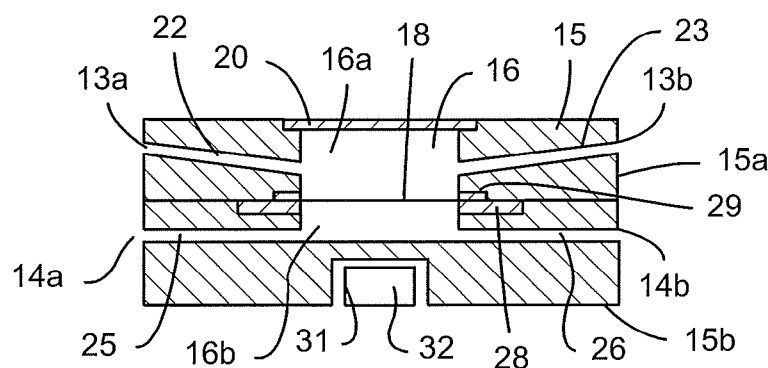
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(54) Title: MICRO-FLUIDIC SYSTEM USING MICRO-APERTURES FOR HIGH THROUGHPUT DETECTION OF CELLS

**FIG. 2**

(57) Abstract: A microfluidic detection system for micrometer-sized entities, such as biological cells, includes a detector component incorporating a plate with a plurality of opening, the plate separating two chambers, one in communication with a fluid source containing target cells bound to magnetic beads. The openings are sized to always permit passage of the magnetic beads therethrough into a lower one of the chambers and are further sized to always prevent passage of the target cells from the upper one of the chambers. The detector component further includes a magnet positioned to pull unbound magnetic beads through the openings and to capture target cells bound to magnetic beads on the surface of the plate. The microfluidic detection system includes a pump flowing the fluid through the detector component at high flow rates of milliliters per minute for high throughput detection of target cells.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/032356**A. CLASSIFICATION OF SUBJECT MATTER****G01N 33/50(2006.01)i, G01N 33/574(2006.01)i, G01N 27/72(2006.01)i, G01N 33/52(2006.01)i**

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 33/50; C40B 30/00; G01N 27/00; B01D 37/00; G01N 33/552; G01N 33/49; C02F 1/44; C12N 5/08; G01N 21/85; G01N 33/53; C40B 60/12

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: microfluidic, detection, aperture, magnetic, bead, and circulating tumor cell

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0233822 A1 (PRINS, MENNO WILLEM JOSE et al.) 16 September 2010 See abstract; claims 1,17,20; paras. [0031]-[0034],[0044]-[0045]; figs. 1,3-6,8-9.	1-43
A	US 2003-0134416 A1 (YAMANISHI, DOUGLAS et al.) 17 July 2003 See abstract; claims 1,55,158,167,178; paras. [0034],[0091]; fig. 16A.	1-43
A	US 2008-0160537 A1 (LUOTOLA, JUHANI et al.) 03 July 2008 See abstract; claims 1,21; paras. [0027],[0044],[0116]; fig. 3.	1-43
A	US 2009-0305901 A1 (SEEMANN, LIVIA et al.) 10 December 2009 See abstract; claims 1,7,16-17; paras. [0012],[0044]-[0045]; fig. 1.	1-43
A	US 2008-0318324 A1 (CHIU, DANIEL T. et al.) 25 December 2008 See abstract; claims 1,23; paras. [0113],[0115],[0131]; fig. 1A.	1-43



Further documents are listed in the continuation of Box C.



See patent family annex.

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"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

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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