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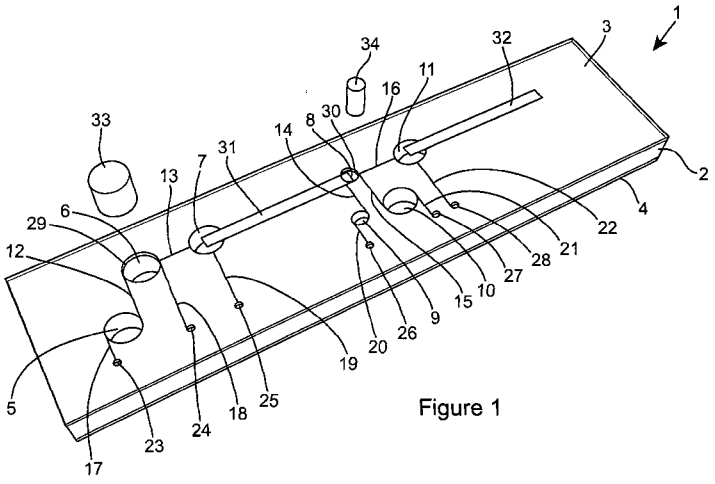

Figure 1

(57) Abstract: A device (1) for carrying out a chemical or biochemical reaction and detecting the results, such as an assay to detect a target nucleic acid in a sample, said device comprising (i) a first well (8) in which a chemical or biochemical reaction such as a nucleic acid amplification reaction may be effected in a liquid phase or a receiving means for such a first well; (ii) a first channel (16) extending from the first well; (iii) a lateral flow assay device (32) arranged to receive liquid contents from said first channel, optionally by way of second well, on a bibulous membrane thereon, wherein said membrane contains elements that are able to detect the products of the chemical or biochemical reaction such as a target nucleic acid. Methods for using such devices and apparatus for carrying out assays using these are also described and claimed.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. B01L3/00 C12Q1/68
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 C12Q

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 2004/065010 A2 (MICRONICS INC [US]; BATTRELL C FREDERICK [US]; WEIGL BERNHARD H [US];) 5 August 2004 (2004-08-05) page 13, line 3 - page 15, line 29; figures 1a,1b,5	1-19,29, 33-36
X	WO 2009/080817 A2 (AJ INNUSCREEN GBMH [DE]; HILLEBRAND TIMO [DE]; KNIPPSCHILD CLAUS [DE];) 2 July 2009 (2009-07-02) paragraph [0040] - paragraph [0041]; figures 1-2; examples 1-5	1-9,11, 19,29, 33-36
X	WO 2006/041524 A2 (ACCESS BIO INC [US]; JUNG JAEAN [US]; CHOI YOUNG HO [US]; KIM YOUNGSUN) 20 April 2006 (2006-04-20)	1
A	claims 1-3; figures 7,8	2-19,29, 33-36

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[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
2 February 2011	05/07/2011

Name and mailing address of the ISA/	Authorized officer
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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2010/051832

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 99/33559 A1 (CEPHEID [US]; POURAHMADI FARZAD [US]; MCMILLAN WILLIAM A [US]; CHING J) 8 July 1999 (1999-07-08)	1
A	page 64, line 26 - page 67, line 5; figures 1,16	2-19,29, 33-36

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2010/051832

Box No. 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.:
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:

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 No. 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 fees, this Authority did not invite payment of additional fees.

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.:

1-19, 29, 33-36

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-19, 29, 33-36

Claims 1-18: Device for carrying out an assay to detect a target nucleic acid in a sample comprising a well in which a nucleic acid amplification reaction of said target nucleic acid may be effected or a receiving means for such a first well, a channel extending from said well, and a lateral flow assay device arranged to receive sample from said first channel.
Claim 19: Device for carrying out a chemical or biochemical reaction and detecting the product thereof comprising (i) a first well in which a chemical or biochemical reaction may be effected in a liquid phase; (ii) a first channel extending from said first well; (iii) a lateral flow assay device arranged to receive liquid contents from said first channel, optionally by way of a second well, on a bibulous membrane thereon, wherein said membrane contains elements that are able to detect product of said chemical or biochemical reaction, and (iv) a third well that is arranged to contain diluent and connected to said first well, by means of a second channel.
Claim 29: System for carrying out an assay to detect a nucleic acid in a sample, said system comprising a device comprising an amplification reaction chamber, a first bibulous membrane arranged to extract nucleic acid from a sample and deliver it to the amplification chamber and a second bibulous membrane arranged as a lateral flow device to detect nucleic acid within an amplification product obtained in said chamber; and means for delivering the product obtained in the amplification chamber to a sample receiving zone of said lateral flow device.
Claim 33: Method for carrying out a chemical or biochemical reaction and detecting the product thereof on a membrane of a lateral flow assay device comprising adding a sample to a first well of a device according to claim 19.

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2. claims: 20-22

Reagent dispenser comprising a plug, wand or cap, adapted to fit into said first well of a device according to any one of the preceding claims and comprising at least some of the reagents required to carry out a nucleic acid amplification reaction.

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3. claims: 23-28, 30-32

Claims 23-26: Apparatus for carrying out a chemical or biochemical reaction and detecting the product comprising i) means for receiving a device according to any one of claims 1 to 19, and ii) heating means arranged to controllably heat

said first well so as to allow a chemical or biochemical reaction to be carried out therein.
Claims 27-28: System for carrying out an assay to detect a nucleic acid in a sample, said system comprising a combination of a device according to any one of claims 1 to 18 and apparatus according to any one of claims 23 to 26.
Claims 30-32: Method for carrying out an assay to detect a nucleic acid in a sample, said method comprising adding a sample to a device according to any one of claims 1 to 18, loading said device into apparatus according to any one of claims 23 to 25 and causing said apparatus to carry out a nucleic acid amplification and detection reaction therein, reading the results from the lateral flow assay device.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2010/051832

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