(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 11 January 2007 (11.01.2007)

PCT

(10) International Publication Number WO 2007/005974 A3

(51) International Patent Classification: *B01L 3/00* (2006.01) *G01N 15/14* (2006.01)

(21) International Application Number:

PCT/US2006/026212

(22) International Filing Date: 30 June 2006 (30.06.2006)

(25) Filing Language: English

(26) Publication Language: English

(**30**) **Priority Data:** 60/696,162

1 July 2005 (01.07.2005) US

(71) Applicant (for all designated States except US): HONEY-WELL INTERNATIONAL, INC. [US/US]; 101 Columbia Road, Morristown, New Jersey 07962 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): PADMANABHAN, Aravind [IN/US]; 17625 - 45th Avenue North, Plymouth, Minnesota 55446 (US). CABUZ, Cleopatra [RO/US]; 10300 Bucks Way, Eden Prairie, Minnesota 55347 (US).

(74) Agent: SHUDY, John, R.; Honeywell International, Inc., Patent Services, 101 Columbia Road, AB-2B, P.O. Box 2245, Morristown, New Jersey 07962 (US).

(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.

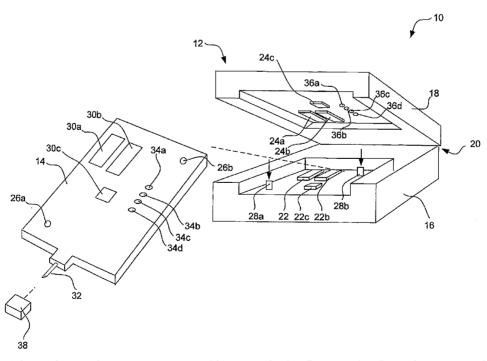
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, 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: 14 June 2007

[Continued on next page]

(54) Title: A FLOW METERED ANALYZER



(57) Abstract: A hematology analyzer or cytometer cartridge system having flow metering. It may have on - or off-cartridge flow metering and control. The system may have local and direct flow measurement to provide accurate counts per unit volume. There may be numerous arrangements for fluidic circuit checks of the cartridge. Examples may include checks pertaining to zero flow, interface, pressure, flow rate, fluid type and quality, backflow, dry qualification, temperature exposure limits, and so on, of the circuits and cartridge associated items.



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.

International application No PCT/US2006/026212

A. CLASSIFICATION OF SUBJECT MATTER INV. B01L3/00 G01N15/14

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) 601N-B01L-G01K-G01M

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the	e relevant passages	Relevant to claim No.	
X Y	US 2005/105077 A1 (PADMANABHAN [US] ET AL) 19 May 2005 (2005-paragraphs [0002], [0004], [0010] - [0012], [0021], [00 [0072], [0073], [0076], [01 [0188]; claims 1-3; figures 1-	05-19) 0005], 67], 87],	3 1,2	
Υ	US 5 939 326 A (CHUPP VERNON L 17 August 1999 (1999-08-17) column 62, line 34 - line 43; column 63, line 19 - line 24		1,2	
Υ	US 2005/073686 A1 (ROTH WAYNE AL) 7 April 2005 (2005-04-07) paragraph [0116]	D [US] ET	1,2	
	ther documents are listed in the continuation of Box C. categories of cited documents :	See patent family annex. "T" later document published after the integration of priority date and not in conflict with	ernational filing date	
consi "E" earlier filing "L" docum which citatic "O" docum other "P" docum	nent defining the general state of the art which is not idered to be of particular relevance document but published on or after the international date nent which may throw doubts on priority claim(s) or is cited to establish the publication date of another on or other special reason (as specified) nent referring to an oral disclosure, use, exhibition or means nent published prior to the international filing date but than the priority date claimed	or priority date and not in conflict with cited to understand the principle or the invention "X" document of particular relevance; the cannot be considered novel or cannot involve an inventive step when the description of particular relevance; the cannot be considered to involve an indocument is combined with one or ments, such combination being obvious in the art. "&" document member of the same patent.	claimed invention It be considered to be current is taken alone claimed invention inventive step when the ore other such docu- issues to a person skilled	
	e actual completion of the international search 16 April 2007	Date of mailing of the international sea	arch report	
Name and	mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Authorized officer de Biasio, Arnaldo		

International application No PCT/US2006/026212

tion). DOCUMENTS CONSIDERED TO BE RELEVANT	
Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
US 2005/106739 A1 (CABUZ CLEOPATRA [US] ET AL) 19 May 2005 (2005-05-19)	5,6
claims 1,2,8-20; figures 1-4	4
JP 2002 243572 A (OSAKA GAS CO LTD) 28 August 2002 (2002-08-28) abstract	4
US 2004/202581 A1 (BERNDT MANFRED [DE]) 14 October 2004 (2004-10-14) claims 18,22,24	5
US 5 726 404 A (BRODY JAMES P [US]) 10 March 1998 (1998-03-10) claims 1,9-12,17-19; figures 3,6	6
DE 31 27 560 A1 (JOCHIMSEN SIEGFRIED [DE]) 17 February 1983 (1983-02-17) page 4, line 17 - line 20	7
US 2005/106742 A1 (WAHL HANS-PETER [DE]) 19 May 2005 (2005-05-19) paragraphs [0039], [0043], [0053]; figure 8	7
US 2003/083685 A1 (FREEMAN DOMINIQUE M [US] ET AL) 1 May 2003 (2003-05-01) paragraphs [0264], [0269]	7
US 2004/259241 A1 (BARRINGER GEORGE E [US] BARRINGER JR GEORGE E [US]) 23 December 2004 (2004-12-23) paragraphs [0003], [0072], [0074]; claims 36,37	8
US 5 315 861 A (EGAN GEORGE P [US] ET AL) 31 May 1994 (1994-05-31) column 2, line 47 - column 3, line 4; claims 1,2; figure 2 column 4, line 28 - line 59	9
US 3 731 524 A (LANGLEY L ET AL) 8 May 1973 (1973-05-08) column 1, line 2 - line 25; claim 1	9
US 4 664 056 A (JEHANNO JEAN-VINCENT [FR]) 12 May 1987 (1987-05-12) column 1, line 5 - line 21; claim 1; figures 5-15	10
US 5 924 294 A (TIBY GERARD [FR]) 20 July 1999 (1999-07-20) column 1, line 6 - line 10; claims 1,2	10
-/	
	US 2005/106739 A1 (CABUZ CLEOPATRA [US] ET AL) 19 May 2005 (2005-05-19) claims 1,2,8-20; figures 1-4 JP 2002 243572 A (OSAKA GAS CO LTD) 28 August 2002 (2002-08-28) abstract US 2004/202581 A1 (BERNDT MANFRED [DE]) 14 October 2004 (2004-10-14) claims 18,22,24 US 5 726 404 A (BRODY JAMES P [US]) 10 March 1998 (1998-03-10) claims 1,9-12,17-19; figures 3,6 DE 31 27 560 A1 (JOCHIMSEN SIEGFRIED [DE]) 17 February 1983 (1983-02-17) page 4, line 17 - line 20 US 2005/106742 A1 (WAHL HANS-PETER [DE]) 19 May 2005 (2005-05-19) paragraphs [0039], [0043], [0053]; figure 8 US 2003/083685 A1 (FREEMAN DOMINIQUE M [US] ET AL) 1 May 2003 (2003-05-01) paragraphs [0264], [0269] US 2004/259241 A1 (BARRINGER GEORGE E [US] BARRINGER JR GEORGE E [US]) 23 December 2004 (2004-12-23) paragraphs [0003], [0072], [0074]; claims 36,37 US 5 315 861 A (EGAN GEORGE P [US] ET AL) 31 May 1994 (1994-05-31) column 2, line 47 - column 3, line 4; claims 1,2; figure 2 column 4, line 28 - line 59 US 3 731 524 A (LANGLEY L ET AL) 8 May 1973 (1973-05-08) column 1, line 2 - line 25; claim 1 US 4 664 056 A (JEHANNO JEAN-VINCENT [FR]) 12 May 1987 (1987-05-12) column 1, line 5 - line 21; claim 1; figures 5-15 US 5 924 294 A (TIBY GERARD [FR]) 20 July 1999 (1999-07-20) column 1, line 6 - line 10; claims 1,2

International application No
PCT/US2006/026212

International application No. PCT/US2006/026212

INTERNATIONAL SEARCH REPORT

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:							
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 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.:							
Remark on Protest The additional search fees were accompanied by the applicant's protest. X 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: 1,2,3

Microfluid analyzer system comprising a fluidic circuit, a flow sensor, a pump/pressure source and a processor, wherein flow rate data measured by the flow sensor are sent to the processor and are used to correct the results obtained by the analyzer (claim 1) or to perform a closed-loop control of the flow-rate (claim 3).

2. claims: 4-6

Check system for a channel of a cytometer or a fluid interface between two units of a hematology analyzer

3. claim: 7

System for checking a fluid in a channel of a hematology analyzer

4. claim: 8

System for checking backflow in a channel of a cytometer

5. claim: 9

System for dry qualification of a fluidic cartridge

6. claim: 10

Sytem for temperature exposure limit check of a fluidic cartridge of a cytometer

Information on patent family members

International application No
PCT/US2006/026212

	Patent document ed in search report		Publication date		Patent family member(s)		Publication date
US	2005105077	A1	19-05-2005	NONE			
US	5 5939326	Α	17-08-1999	US	5891734	Α	06-04-1999
US	2005073686	A1	07-04-2005	AU CA WO	2004265989 2535333 2005017499	A1	24-02-2005 24-02-2005 24-02-2005
US	2005106739	A1	19-05-2005	US	2005118723	A1	02-06-2005
JP	2002243572	Α	28-08-2002	NONE			
US	2004202581	A1	14-10-2004	NONE			
US	5726404	Α	10-03-1998	AU DE DE EP JP WO	2935197 69709864 69709864 0901578 2001503681 9745644	D1 T2 A1 T	05-01-1998 28-02-2002 19-09-2002 17-03-1999 21-03-2001 04-12-1997
DE	3127560	A1	17-02-1983	NONE			
US	2005106742	A1	19-05-2005	CA JP	2479452 2005130851		28-02-2005 26-05-2005
US	2003083685	A1	01-05-2003	WO	03094752	A1	20-11-2003
US	2004259241	A1	23-12-2004	EP US WO	1636331 2007072285 2004113907	A1	22-03-2006 29-03-2007 29-12-2004
US	5315861	Α	31-05-1994	US	5419181	Α	30-05-1995
US	3731524	Α	08-05-1973	FR GB	1554827 1206959		24-01-1969 30-09-1970
US	4664056	A	12-05-1987	DE EP ES FR JP JP JP	3573654 0153259 8700435 2560992 1823206 5030207 60242332	A1 A1 A1 C	16-11-1989 28-08-1985 01-01-1987 13-09-1985 10-02-1994 07-05-1993 02-12-1985
US	5924294	A	20-07-1999	DE DE EP FR WO	69504499 69504499 0760088 2720158 9531704	T2 A1 A1	08-10-1998 12-05-1999 05-03-1997 24-11-1995 23-11-1995
JP	63165480	A	08-07-1988	NONE			