

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
29 December 2005 (29.12.2005)

PCT

(10) International Publication Number  
**WO 2005/124345 A3**

(51) International Patent Classification<sup>7</sup>: **G01N 33/543**,  
33/49

(21) International Application Number:  
PCT/GB2005/002427

(22) International Filing Date: 20 June 2005 (20.06.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0413752.7 19 June 2004 (19.06.2004) GB

(71) Applicant (for all designated States except US): **HALL EFFECT TECHNOLOGIES LIMITED** [GB/GB];  
Beechwood Business Park North, Inverness IV2 3BL (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CONNOLLY, Patricia** [GB/GB]; 47 Hughenden Gardens, Glasgow G12 9YH (GB). **FULLER, John** [GB/GB]; Easter Shian, Glen Quaich, Amulree, Perthshire (GB).

(74) Agents: **DOWNEY, William, Gerrard** et al.; Wilson Gunn M'Caw, 5th Floor, Blackfriars House, The Parsonage, Manchester M3 2JA (GB).

(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, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, 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).

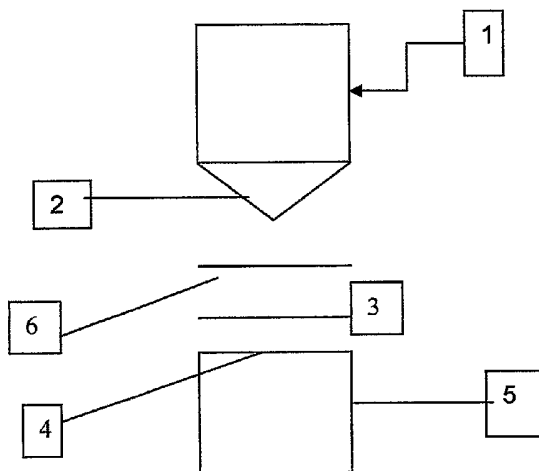
**Published:**

- 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:  
20 April 2006

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: METHOD OF DETERMINING THE PRESENCE AND/OR CONCENTRATION OF SUBSTANCES OF INTEREST IN FLUIDS



(57) Abstract: Magnetic particles coated with specific antibodies for substances of interest are introduced into a fluid sample. Over time and with agitation, the magnetic particles become attached to the substance of interest within the fluid. The fluid is then introduced to a magnetic field gradient provided between two magnets (1, 5). the resultant change to the magnetic field between the magnets (1, 5) is determine by a Hall Effect device (3) or a plurality of Hall Effect devices (3). This enables the presence and/or concentration of the substance of interest in the sample to be determined.

WO 2005/124345 A3

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/JP2005/002427

**A. CLASSIFICATION OF SUBJECT MATTER**  
G01N33/543 G01N33/49

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

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PUCKETT L G ET AL: "Monitoring blood coagulation with magnetoelastic sensors" BIOSENSORS & BIOELECTRONICS, ELSEVIER SCIENCE PUBLISHERS, BARKING, GB, vol. 18, no. 5-6, March 2003 (2003-03), pages 675-681, XP002295883 ISSN: 0956-5663 page 676 - page 678	1-73
Y	US 5 841 023 A (PARKER ET AL) 24 November 1998 (1998-11-24) abstract; claims	1-73
A	US 6 136 271 A (LORINCZ ET AL) 24 October 2000 (2000-10-24) abstract; claims	1-73
	----- -/--	

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.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

15 February 2006

Date of mailing of the international search report

24/02/2006

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

GONCALVES MAUGER, M

## INTERNATIONAL SEARCH REPORT

 International application No  
 /GB2005/002427

G(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004/104736 A1 (COHEN EMANUEL ET AL) 3 June 2004 (2004-06-03) abstract; claims -----	1-73
Y	WO 02/088696 A (HALL EFFECT TECHNOLOGIES LTD; DJENNATI, NASR-EDDINE; COHEN, EMANUEL) 7 November 2002 (2002-11-07) abstract; claims 15-18; figures -----	1-73
A	DE 196 16 467 A1 (KOZIOL, JOHANNES CHRISTIAN, 33175 BAD LIPPSRINGE, DE) 6 November 1997 (1997-11-06) abstract; claims -----	1-73
Y	WO 98/48282 A (BYK GULDEN ITALIA S.P.A; CONNOLLY, PATRICIA) 29 October 1998 (1998-10-29) abstract; claims -----	40-73
A	US 2001/052770 A1 (SIMMONDS MICHAEL BANCROFT ET AL) 20 December 2001 (2001-12-20) abstract; claims 38-50 -----	1-73
A	US 6 437 563 B1 (SIMMONDS MICHAEL BANCROFT ET AL) 20 August 2002 (2002-08-20) cited in the application abstract; claims 37-48 -----	1-73

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

GB2005/002427

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5841023	A	24-11-1998	CA 2170043 A1	09-03-1995
			DE 69434531 D1	08-12-2005
			EP 0716738 A1	19-06-1996
			JP 9503052 T	25-03-1997
			WO 9506869 A1	09-03-1995
US 6136271	A	24-10-2000	NONE	
US 2004104736	A1	03-06-2004	CN 1529811 A	15-09-2004
			EP 1379860 A1	14-01-2004
			WO 02073179 A1	19-09-2002
			JP 2004533867 T	11-11-2004
WO 02088696	A	07-11-2002	CN 1505758 A	16-06-2004
			EP 1395816 A1	10-03-2004
			JP 2004524546 T	12-08-2004
			US 2005113662 A1	26-05-2005
DE 19616467	A1	06-11-1997	NONE	
WO 9848282	A	29-10-1998	AT 224544 T	15-10-2002
			DE 69808071 D1	24-10-2002
			DE 69808071 T2	28-05-2003
			DK 975974 T3	20-01-2003
			EP 0872736 A1	21-10-1998
			ES 2184260 T3	01-04-2003
			JP 3693680 B2	07-09-2005
			JP 2002511926 T	16-04-2002
			PT 975974 T	28-02-2003
			US 6235491 B1	22-05-2001
US 2001052770	A1	20-12-2001	US 2001052769 A1	20-12-2001
US 6437563	B1	20-08-2002	AT 280390 T	15-11-2004
			AU 9207998 A	15-06-1999
			BR 9815566 A	31-10-2000
			CA 2311301 A1	03-06-1999
			CN 1128365 C	19-11-2003
			DE 69827158 D1	25-11-2004
			DE 69827158 T2	13-10-2005
			EP 1036328 A1	20-09-2000
			ES 2232020 T3	16-05-2005
			HK 1033771 A1	14-05-2004
			IL 136211 A	10-04-2003
			JP 2001524675 T	04-12-2001
			WO 9927369 A1	03-06-1999
			US 6275031 B1	14-08-2001
			US 6046585 A	04-04-2000