

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 March 2007 (01.03.2007)

PCT

(10) International Publication Number
WO 2007/022620 A3

(51) International Patent Classification:

A61B 5/0215 (2006.01) A61B 5/0402 (2006.01)
A61B 5/01 (2006.01) A61B 5/042 (2006.01)
A61B 5/02 (2006.01)

(21) International Application Number:

PCT/CA2006/001358

(22) International Filing Date: 18 August 2006 (18.08.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

11/207,705 22 August 2005 (22.08.2005) US

(71) Applicant (for all designated States except US):
SCISENSE INC. [CA/CA]; Unit 3, 3397 White Oak Road, London, Ontario N6E 3A1 (CA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **PLOUF, Peter** [US/CA]; 34 Deveron Crescent, London, Ontario N5Z 4B1 (CA). **POETSCHKE, Blair** [CA/CA]; 576 Jamaica

Street, London, Ontario N6K 1E7 (CA). **PLACKO, Milan** [CA/CA]; 583 Jamaica Court, London, Ontario N6K 1N2 (CA). **WOOD, Kim** [CA/CA]; 23 Mockingbird Lane, London, Ontario N6J 4T4 (CA).

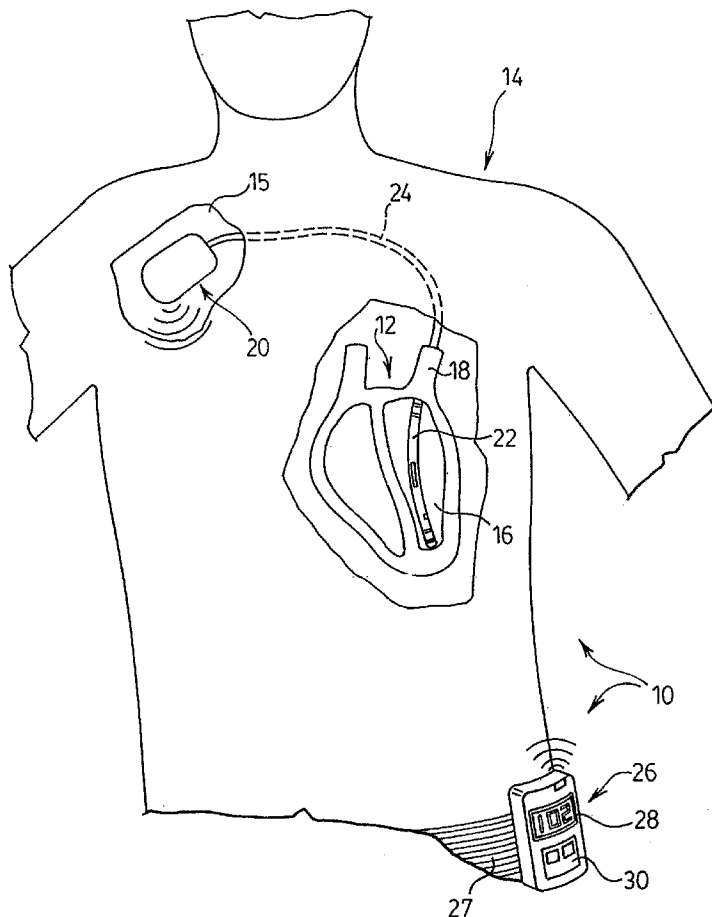
(74) Agents: **SLANEY, Brett J.** et al.; Blake, Cassels & Graydon LLP, Box 25, Commerce Court West, 199 Bay Street, Toronto, Ontario M5L 1A9 (CA).

(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, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, 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,

[Continued on next page]

(54) Title: IMPLANT TRANSMITTER



(57) Abstract: A monitoring system is provided that enables the monitoring of a heart in a living organism by continuously measuring both pressure and volume in a chamber of the heart, preferably the left ventricle (LV). The pressure and volume measurements are acquired using a single sensing tip and are communicated to a transmitting device to be wirelessly transmitted to a receiving device, wherein they are used to monitor the heart. The system may also incorporate a temperature measurement that can be transmitted with the volume and pressure measurement to provide further data for monitoring. The system may also extract an electrocardiogram (ECG) signal from the volume measurement. This allows the monitoring of up to four signals that can be used to determine the beat by beat state of cardiac output and any changes caused by disease or therapy. In addition to a compact design, the system may also incorporate an energy saving timing scheme that reduces the power required per acquisition cycle and thus increases the operational lifetime of the transmitting device.

WO 2007/022620 A3



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

(88) Date of publication of the international search report:
12 April 2007

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 SEARCH REPORT

International application No.
PCT/CA2006/001358

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC: A61B 5/0215 (2006.01) , A61B 5/01 (2006.01) , A61B 5/02 (2006.01) , A61B 5/0402 (2006.01) , A61B 5/042 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) IPC(7): A61B 5/0215, A61B 5/01, A61B 5/02 A61B 5/0402, A61B 5/042</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used) Databases: CPD (Canadian Patent Database), Delphion, Pluspat, Google Keywords: monitoring of heart, volume, pressure, temperature, measurement, ECG signal, left ventricle (LV), diagnosis</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 409 674 (B1) 25 June 2002 (25-06-2002) Brockway et al. ** see Abstract, Figures 1-9**	14-28
Y	US 6 926 674 (B2) 09 August 2005 (09-08-2005) Tenerz et al. ** see Abstract and whole document**	14-28
----	-----	
Y	US 6 865 419 (B2) 8 March 2005 (08-03-2005) Mulligan et al. ** see Abstract, whole document**	29
A	US 5 218 965 15 June 1993 (15-06-1993) Ring** see whole document**	1-29
A	US 6 740 033 (B1) 25 May 2004 (25-05-2004) Olejniczak et al. ** see whole document**	1-29
<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.</p>		
* Special categories of cited documents :	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		
Date of the actual completion of the international search	Date of mailing of the international search report	
4 January 2007 (04-01-2007)	8 January 2007 (08-01-2007)	
Name and mailing address of the ISA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Authorized officer Karen Oprea 819- 934-2668	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2006/001358

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the 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. Claim Nos. : 1-13
because they relate to subject matter not required to be searched by this Authority, namely :

a method of treatment of the human body by an invasive procedure, more specifically the insertion of a sensing tip into a chamber of the heart as well as a the implantation of a transmitting device into a portion of a said living organism
2. Claim 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. Claim Nos. :
because they are dependant 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 :

Claims 1-28 are directed to a method and system for monitoring a heart of a living organism

Claim 29 is directed to a method for obtaining an intracardiac electrocardiogram signal

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 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 claim 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 claim Nos. :

- 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.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2006/001358

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US6409674	25-06-2002	AU9790098 A	03-05-1999
		AU2002251973 A1	04-09-2002
		AU2002343352 A1	14-04-2003
		CA2305998 A1	22-04-1999
		CA2345389 A1	30-03-2000
		CA2438394 A1	29-08-2002
		DE69829399D D1	21-04-2005
		DE69829399T T2	11-05-2006
		DE69929448D D1	06-04-2006
		DE69929448T T2	21-09-2006
		EP1022983 A1	02-08-2000
		EP1115329 A2	18-07-2001
		EP1367934 A2	10-12-2003
		JP2004532052T T	21-10-2004
		US6033366 A	07-03-2000
		US6296615 B1	02-10-2001
		US6379308 B1	30-04-2002
		US6409674 B1	25-06-2002
		US6659959 B2	09-12-2003
		US6947795 B2	20-09-2005
		US7025727 B2	11-04-2006
		US7097618 B1	29-08-2006
		US2002120200 A1	29-08-2002
		US2002138009 A1	26-09-2002
		US2003195428 A1	16-10-2003
		US2005159789 A1	21-07-2005
		US2005182330 A1	18-08-2005
		US2005261749 A1	24-11-2005
		US2006064135 A1	23-03-2006
		US2006094966 A1	04-05-2006
		US2006253160 A1	09-11-2006
		WO0016686 A2	30-03-2000
		WO9918850 A1	22-04-1999
WO2065894 A2	29-08-2002		
WO03030581 A2	10-04-2003		
WO2006029186 A2	16-03-2006		
US6926674	09-08-2005	US6926674 B2	09-08-2005
		WO02085442 A1	31-10-2002
US6865419	08-03-2005	CA2430748 A1	06-06-2002
		DE60106645D D1	25-11-2004
		DE60106645T T2	24-03-2005
		EP1341439 A2	10-09-2003
		JP2004538035T T	24-12-2004
		US6865419 B2	08-03-2005
		WO0243584 A2	06-06-2002
US5218965	15-06-1993	AT141479T T	15-09-1996
		AU651147B B2	14-07-1994
		AU8772591 A	04-06-1992
		CA2055394 A1	04-06-1992
		DE69121538D D1	26-09-1996
		DE69121538T T2	13-02-1997
		EP0492837 A1	01-07-1992
		ES2095304T T3	16-02-1997
		JP2736195B2 B2	02-04-1998
		NO914635 A	04-06-1992
		NZ240526 A	24-02-1995
		US5218965 A	15-06-1993
US6740033	25-05-2004	EP1060704 A2	20-12-2000
		JP2001023071 A	26-01-2001
		US6740033 B1	25-05-2004