

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 November 2009 (05.11.2009)

(10) International Publication Number
WO 2009/134960 A3

(51) International Patent Classification:

A61N 1/368 (2006.01)

(21) International Application Number:

PCT/US2009/042217

(22) International Filing Date:

30 April 2009 (30.04.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/112,833 30 April 2008 (30.04.2008) US
12/432,502 29 April 2009 (29.04.2009) US

(71) Applicant (for all designated States except US):
MEDTRONIC, INC. [US/US]; 710 Medtronic Parkway
MS LC340, Minneapolis, MN 55432 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BURNES, John, E.**
[US/US]; 12823 Bluebird Street Northwest, Coon Rapids,
MN 55448 (US). **DOLAN, Becky, L.** [US/US]; 28885
Old Towne Road, Chisago City, MN 55013 (US).

(74) Agents: **DUTHLER, Reed, A.** et al.; 710 Medtronic
Parkway MS LC340, Minneapolis, MN 55432 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ,
EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
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, ST, 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,
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, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, 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 (Art. 21(3))
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

8 April 2010

(54) Title: EXTRA-CARDIAC IMPLANTABLE DEVICE WITH FUSION PACING CAPABILITY

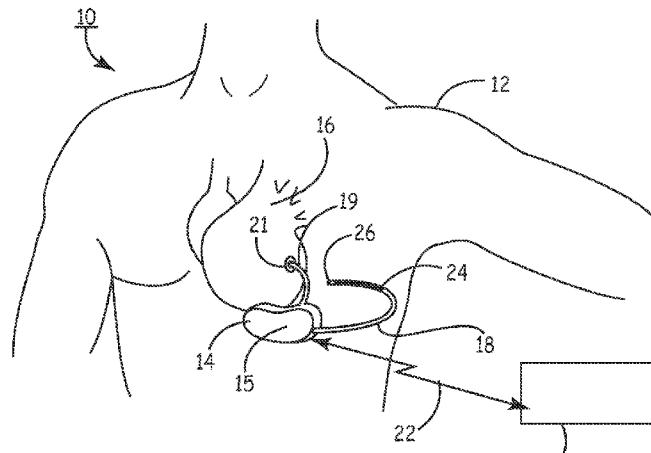


FIG. 1

(57) Abstract: According to this disclosure, a non-transvenous pacing and, optionally defibrillation, therapy device is implanted subcutaneously and oriented to provide cardiac sensing from electrodes spaced from a heart and deliver pacing and/or defibrillation from 0.one or more non-transvenous electrodes (e.g., an epicardial or pericardial electrode or electrode patch). A subject receiving a device according to this disclosure is monitored to confirm a relatively stable bundle branch block (i.e., delayed activation) of one ventricle. The subcutaneous device has electrodes disposed on the housing and/or having an electrode on a subcutaneous medical lead is oriented so that the pacing (and sensing) vector impinges mainly upon the one ventricle, and/or optionally an epicardial or pericardial lead is deployed to a last-to-depolarize ventricle (e.g., a left ventricle) so that single-ventricular pacing is delivered to achieve fusion depolarization of both ventricles.

INTERNATIONAL SEARCH REPORT

International application No PCT/US2009/042217

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61N1/368

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)

A61N

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	US 2006/235478 A1 (VAN GELDER BERRY [NL] ET AL) 19 October 2006 (2006-10-19) paragraphs [0009] - [0020], [0036] - [0050], [0056] - [0075], [0080] - [0120]; claims; figures	1-13
Y	US 2007/191891 A1 (BURNES JOHN E [US] ET AL) 16 August 2007 (2007-08-16) paragraphs [0008] - [0041], [0044] - [0066]	14-15
X	WO 2005/056108 A2 (MEDTRONIC INC [US]; CHINCHOY EDWARD [US]; SHETH NIRAV VIJAY [US]; HILP) 23 June 2005 (2005-06-23) pages 2-8	1-6, 10-11
Y	page 11 - page 14	13-15
		1-4,10
		-/-

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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 February 2010	25/02/2010
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Crisan, Carmen-Clara

INTERNATIONAL SEARCH REPORT

International application No PCT/US2009/042217

C(continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 514 163 A (MARKOWITZ H TOBY [US] ET AL) 7 May 1996 (1996-05-07) column 3, line 6 – column 6, line 27 column 7, line 19 – column 12, line 21; claims; figures -----	13-15
Y	US 2004/193223 A1 (KRAMER ANDREW P [US] ET AL) 30 September 2004 (2004-09-30) paragraphs [0019], [0028] – [0042], [0069]; claim 12 -----	13-15
Y	US 2006/224198 A1 (DONG YANTING [US] ET AL) 5 October 2006 (2006-10-05) paragraphs [0015] – [0017], [0026] -----	13-15
Y	US 6 871 096 B2 (HILL MICHAEL R S [US]) 22 March 2005 (2005-03-22) cited in the application column 4, lines 53-56 column 9, lines 18-24 -----	13-15
A	US 5 713 930 A (VAN DER VEEN JOHANNES S [NL] ET AL) 3 February 1998 (1998-02-03) the whole document -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

 International application No
 PCT/US2009/042217

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 2006235478	A1	19-10-2006	EP WO	1888170 A1 2006113405 A1		20-02-2008 26-10-2006
US 2007191891	A1	16-08-2007	EP WO	2117646 A1 2008097959 A1		18-11-2009 14-08-2008
WO 2005056108	A2	23-06-2005	CA EP	2548001 A1 1703946 A2		23-06-2005 27-09-2006
US 5514163	A	07-05-1996	AU CA DE DE EP JP JP WO	4766296 A 2211595 A1 69600595 D1 69600595 T2 0812222 A1 3187057 B2 10504753 T 9625975 A1		11-09-1996 29-08-1996 08-10-1998 20-05-1999 17-12-1997 11-07-2001 12-05-1998 29-08-1996
US 2004193223	A1	30-09-2004	AT EP JP WO	444098 T 1596934 A2 2006515796 T 2004069333 A2		15-10-2009 23-11-2005 08-06-2006 19-08-2004
US 2006224198	A1	05-10-2006	US	2009264949 A1		22-10-2009
US 6871096	B2	22-03-2005	CA DE EP JP JP US WO	2463888 A1 60223836 T2 1446191 A1 4237058 B2 2005507720 T 2003083700 A1 03037427 A1		08-05-2003 16-10-2008 18-08-2004 11-03-2009 24-03-2005 01-05-2003 08-05-2003
US 5713930	A	03-02-1998	DE DE EP	69724908 D1 69724908 T2 0841075 A2		23-10-2003 22-07-2004 13-05-1998