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(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, CL, 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, PE, 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.

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[Continued on next page]

(54) **Title**: INTERFERENCE MITIGATION FOR IMPLANTABLE DEVICE RECHARGING

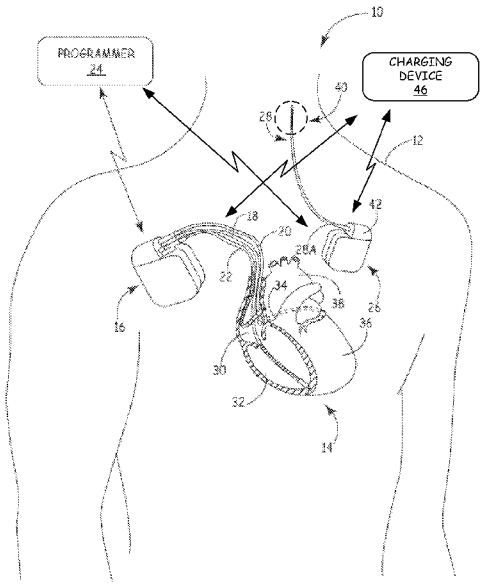

FIG. 1

(57) **Abstract**: A therapy or monitoring system may implement one or more techniques to mitigate interference between operation of a charging device that charges a first implantable medical device (IMD) implanted in a patient and a second IMD implanted in the patient. In some examples, the techniques may include modifying an operating parameter of the charging device in response to receiving an indication that a second IMD is implanted in the patient. The techniques also may include modifying an operating parameter of the second IMD in response to detecting the presence or operation of the charging device.

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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))*

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61N1/378 A61N1/372
ADD. A61N1/37 H02J7/02

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 H02J A61F

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 2003/045906 A1 (STROEBEL JOHN C [US] ET AL) 6 March 2003 (2003-03-06)	1-3,11
A	figures 1,2,4 paragraph [0005] - paragraph [0013] paragraph [0028] - paragraph [0040] paragraph [0047] - paragraph [0061]	4
X,P	WO 2009/055579 A1 (MEDTRONIC INC [US]; WAHLSTRAND CARL D [US]; KAST JOHN E [US]; DENISON) 30 April 2009 (2009-04-30) figures 11A, 11B, 13-18 page 13, line 24 - page 35, line 3	1-3,11
A	US 2003/078634 A1 (SCHULMAN JOSEPH H [US] ET AL) 24 April 2003 (2003-04-24) the whole document	1-4,11

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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
14 December 2010	22/12/2010

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ließmann, Frank

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/062833

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BUDGETT DAVID M ET AL: "Novel technology for the provision of power to implantable physiological devices." JOURNAL OF APPLIED PHYSIOLOGY, vol. 102, no. 4, April 2007 (2007-04), pages 1658-1663, XP002591889 BETHESDA, MD. ISSN: 8750-7587 the whole document	1-4,11

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/062833

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.:

1-4, 11

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: 1-4, 11

A system comprising a processor that modifies the operating parameter of the charging device to prompt the second therapy module to adjust a cardiacc activity detection threshold whilethe first therapy module is charged.

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2. claims: 5, 6, 12

A system comprising a processor that modifies the operating parameter of the charging device by at least controlling the charging device to generate a charging signal that comprises a frequency greater than a threshold frequency or a frequency that is attenuated by a filter in the second therapy module.

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3. claims: 7, 13

A system comprising a processor that modifies the operating parameter of the charging device to deliver a charging signal to the first therapy module during a blanking period of the second therapy module.

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4. claim: 8

A system comprising a processor that modifies the operating parameter of the charging device to generate a charging signal that comprises a spread spectrum energy or wide band energy distribution.

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5. claims: 9, 15

A system comprising a processor that controls the charging device to deliver a first charging signal comprising a first amplitude followed by a plurality of charging signals each comprising amplitudes less than the first amplitude.

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6. claims: 10, 14

A system comprising a processor that controls the charging device to generate a charging signal that induces, in the electrical conductor, a voltage comprising a second amplitude less than the first amplitude of a cardiac signal.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2009/062833

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		EP 1438102 A2	21-07-2004
		WO 03039652 A2	15-05-2003