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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, QA, RO, RS, RU, RW, SC, SD,

[Continued on next page]

(54) Title: NEURAL STIMULATOR SYSTEM

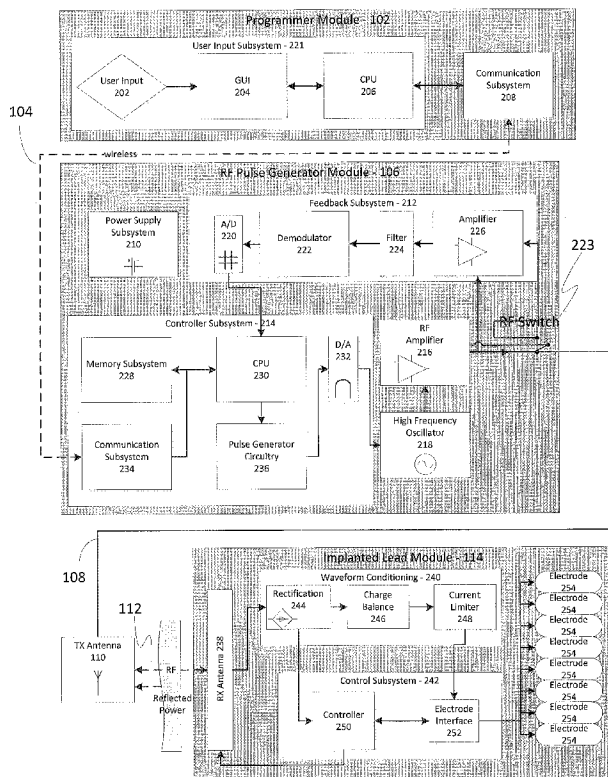


FIG 2

(57) Abstract: An implantable neural stimulator includes one or more electrodes, a first antenna, and one or more circuits. The one or more electrodes configured to apply one or more electrical pulses to neural tissue. The first antenna is a dipole antenna and is configured to receive an input signal containing electrical energy. The one or more circuits are configured to create one or more electrical pulses suitable using the electrical energy contained in the input signal; supply the one or more electrical pulses to the one or more electrodes such that the one or more electrodes apply the one or more electrical pulses to neural tissue; generate a stimulus feedback signal; and send the stimulus feedback signal to the dipole antenna such that the dipole antenna transmits the stimulus feedback signal to the second antenna through electrical radiative coupling.



SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

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PCT/US 12/23029

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - A61N 1/00 (2012.01) USPC - 607/60 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(8) - A61N 1/00 (2012.01) USPC - 607/60</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8) - A61N 1/00 (2012.01) (keyword limited - see terms below) USPC - 607/60, 68-72 (keyword limited - see terms below)</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST (PGPB, USPT, EPAB, JPAB), Google Scholar, Google Patents; Search Terms Used: neural stimulator, stimulat\$4, activat\$4, neural, organ, sensory, rectp\$3, impant\$5, medtronic, dipole, antenna, electrode, frequenc\$3, radiat\$4, energiz\$4, rectifier, capacitor, charge, encod\$3, phase, exceed\$3, surpass\$3, circuit, feedback signal, zero charge</p>																			
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">Category*</th> <th style="width:70%;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="width:20%;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td rowspan="2">US 2007/0213783 A1 (Pless) 13 September 2007 (13.09.2007), entire document, especially; para. [0020], [0053], [0081], [0083], [0085], [0090], [0091], [0100], [0103], [0104], [0124], [0136], [0147], [0151], [0157], [0159], [0162], [0174], [0186], [0188], [0194], [0195], Fig. 2</td> <td>1-7, 9, 11-26, 28, 30-39</td> </tr> <tr> <td>---</td> <td>-----</td> </tr> <tr> <td>Y</td> <td></td> <td>8, 10, 27, 29, 40</td> </tr> <tr> <td>Y</td> <td>US 6,415,184 B1 (Ishikawa et al.) 02 July 2002 (02.07.2002), entire document, especially; col. 14, ln. 35-40, col. 8, ln. 10 - 20).</td> <td>8, 10, 27, 29, 40</td> </tr> <tr> <td>A</td> <td>US 2007/0288066 A1 (Christman et al.) 13 December 2007 (13.12.2007), entire document</td> <td>1 - 40</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 2007/0213783 A1 (Pless) 13 September 2007 (13.09.2007), entire document, especially; para. [0020], [0053], [0081], [0083], [0085], [0090], [0091], [0100], [0103], [0104], [0124], [0136], [0147], [0151], [0157], [0159], [0162], [0174], [0186], [0188], [0194], [0195], Fig. 2	1-7, 9, 11-26, 28, 30-39	---	-----	Y		8, 10, 27, 29, 40	Y	US 6,415,184 B1 (Ishikawa et al.) 02 July 2002 (02.07.2002), entire document, especially; col. 14, ln. 35-40, col. 8, ln. 10 - 20).	8, 10, 27, 29, 40	A	US 2007/0288066 A1 (Christman et al.) 13 December 2007 (13.12.2007), entire document	1 - 40
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<p>Date of the actual completion of the international search</p> <p>02 May 2012 (02.05.2012)</p>		<p>Date of mailing of the international search report</p> <p align="center" style="font-size: 1.2em;">16 MAY 2012</p>																	
<p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201</p>		<p>Authorized officer:</p> <p align="center">Lee W. Young</p> <p><small>PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</small></p>																	