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(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): SCHOLTEN,
Patrick [NL/NL]; Hein Braakhuisstraat 22, NL-7434 SK

Lettele (NL). VAN DAM, Peter, M. [NL/NL]; F.D. Roo-
seveltsingel 3, NL-6981EE Doesbur (NL).

(74) Agents: OSTROM, Michael, J. et al.; 710 Medtronic
Parkway MS LC340, Minneapolis, MN 55432 (US).

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(54) Title: IMPLANTABLE MEDICAL DEVICE ORIENTATION DETECTION UTILIZING AN EXTERNAL MAGNET AND
A 3D ACCELEROMETER SENSOR

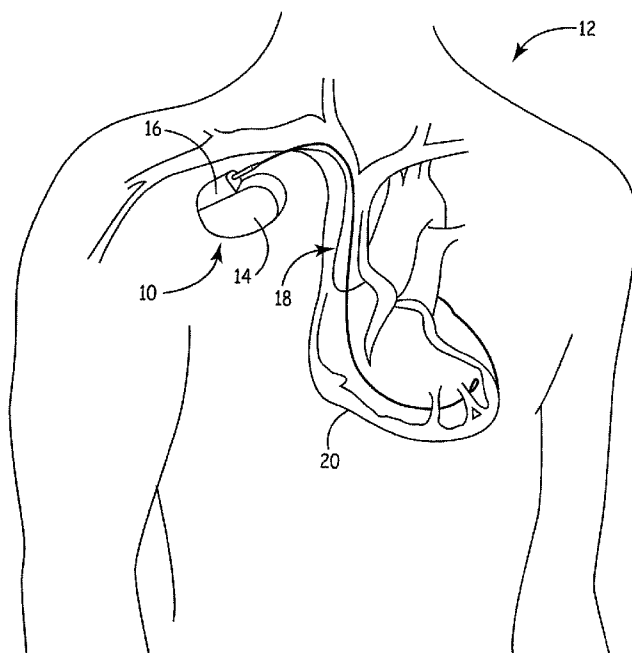


FIG. 1

(57) Abstract: A method and device for detecting the im-
planted orientation of an implantable medical device
(IMD) in a patient. IMD includes an accelerometer for
measuring acceleration signals in three orthogonal direc-
tional axes. A y-axis orientation of IMD is determined
from the measured accelerometer signals using a gravita-
tional force analysis. IMD includes a magnetic sensor that
senses a varying magnetic field exerted on the magnetic
sensor from an external magnet moved along a medial-lat-
eral direction with respect to IMD. The z-axis orientation
of IMD is determined from the location of the external
magnet where the magnetic field exerted on the magnetic
sensor is greatest. Based on a known relationship between
the accelerometer and magnetic sensor, an orthogonal
transformation calculation is performed on the y-axis and
z-axis orientations to yield the x-axis orientation. The im-
planted orientation of IMD with respect to the patient is
thus known and used to compensate accelerometer mea-
surements.



MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR),
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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61B A61N G01P

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)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	US 7 181 281 B1 (KROLL MARK W [US]) 20 February 2007 (2007-02-20) column 8, line 8 - column 9, line 23 figures 1,2,7	1-14
X	US 6 044 297 A (SHELDON TODD J [US] ET AL) 28 March 2000 (2000-03-28) claim 1 figures 2,4	1-14
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

De la Hera, Germán

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	GB 2 314 163 A (WESTERN ATLAS INT INC [US]) 17 December 1997 (1997-12-17) claim 1 -----	1-14
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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