



US009411027B2

(12) **United States Patent**
von Arx et al.

(10) **Patent No.:** **US 9,411,027 B2**

(45) **Date of Patent:** **Aug. 9, 2016**

(54) **METHOD FOR DETERMINING IF AN
IMPLANTABLE MEDICAL DEVICE IS
MAGNETIC RESONANCE CONDITIONAL**

(58) **Field of Classification Search**
CPC G06F 19/3406; G06F 19/322
See application file for complete search history.

(71) Applicant: **BIOTRONIK SE & Co. KG**, Berlin
(DE)

(56) **References Cited**

U.S. PATENT DOCUMENTS

(72) Inventors: **Jeffrey A. von Arx**, Lake Oswego, OR
(US); **Volker Lang**, Berlin (DE)

7,676,272 B2* 3/2010 Lang A61N 1/3708
128/905

(73) Assignee: **BIOTRONIK SE & Co. KG**, Berlin
(DE)

* cited by examiner

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 224 days.

Primary Examiner — Eric S DeJong

(74) *Attorney, Agent, or Firm* — Arc IP Law, PC; Joseph J.
Mayo

(21) Appl. No.: **14/038,205**

(57) **ABSTRACT**

(22) Filed: **Sep. 26, 2013**

(65) **Prior Publication Data**

US 2014/0163892 A1 Jun. 12, 2014

Related U.S. Application Data

(60) Provisional application No. 61/735,073, filed on Dec.
10, 2012.

A method for determining if an implantable medical device
(IMD) in a patient is magnetic resonance conditional.
Embodiments include a Home Monitoring Service Center
(HMSC) that indicates if the IMD is MR conditional and what
those conditions are. The IMD includes memory with flags,
enabling a physician to set a flag to “MR conditional” if the
IMD is MR conditional, if there are no abandoned leads in the
patient, and if there are no other hardware in the patient that
are not MR conditionally approved. In embodiments, the
flags indicate safe for 1.5 T, 3.0 T, 1.5 & 3.0 T, up to 2 W/Kg,
up to 4 W/Kg, with/without exclusion zone, and date flags are
set. During home monitoring, the HMSC reads out a status of
the MR conditional flags and the date last confirmed. If the
patient needs an MRI scan, physician queries HMSC to deter-
mine MR conditional status.

(51) **Int. Cl.**

G01N 33/48 (2006.01)
G01R 33/28 (2006.01)
G06G 7/58 (2006.01)
G06F 19/00 (2011.01)

(52) **U.S. Cl.**

CPC **G01R 33/288** (2013.01); **G06F 19/3406**
(2013.01); **G06F 19/322** (2013.01)

20 Claims, 3 Drawing Sheets