

(12) **United States Patent**
Perryman et al.

(10) **Patent No.:** **US 9,409,029 B2**
(45) **Date of Patent:** **Aug. 9, 2016**

- (54) **REMOTE RF POWER SYSTEM WITH LOW PROFILE TRANSMITTING ANTENNA**
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/710,548**

(22) Filed: **May 12, 2015**

(65) **Prior Publication Data**
US 2015/0321017 A1 Nov. 12, 2015

Related U.S. Application Data

(60) Provisional application No. 61/992,150, filed on May 12, 2014.

(51) **Int. Cl.**
A61N 1/00 (2006.01)
A61N 1/372 (2006.01)
H01Q 9/26 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **A61N 1/37229** (2013.01); **A61N 1/3605** (2013.01); **A61N 1/3787** (2013.01); **H01Q 9/26** (2013.01); **H01Q 13/00** (2013.01)

(58) **Field of Classification Search**
CPC A61N 1/3605; A61N 1/37229; A61N 1/3787; H01Q 13/00; H01Q 9/26
See application file for complete search history.

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(57) **ABSTRACT**

An antenna assembly includes: an antenna including: a metal signal layer having a radiating surface; and a feed port; and a waveguide surrounding the antenna and configured to guide electromagnetic energy transmitted from the radiating surface in a direction away from the antenna; and a controller module connected to the feed port and configured to drive the antenna to transmit electromagnetic energy from the radiating surface; wherein the antenna, waveguide, and controller module are configured such that, when the controller module drives the antenna, the transmitted electromagnetic energy matches a reception characteristic of an implantable device and is sufficient for the implantable device to create one or more electrical pulses of sufficient amplitude to stimulate neural tissue of a patient, solely using electromagnetic energy received from the antenna, when the implantable device is located at least 10 centimeters away from the antenna.

28 Claims, 19 Drawing Sheets

