



US006871099B1

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

(10) **Patent No.:** **US 6,871,099 B1**
(45) **Date of Patent:** **Mar. 22, 2005**

(54) **FULLY IMPLANTABLE
MICROSTIMULATOR FOR SPINAL CORD
STIMULATION AS A THERAPY FOR
CHRONIC PAIN**

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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 314 days.

(21) Appl. No.: **09/929,597**

(22) Filed: **Aug. 13, 2001**

Related U.S. Application Data

(60) Provisional application No. 60/226,333, filed on Aug. 18,
2000.

(51) Int. Cl.⁷ **A61N 1/18**

(52) U.S. Cl. **607/46; 607/72**

(58) **Field of Search** 607/46, 40, 41,
607/108, 58-62, 133, 116-118, 92, 148,
2, 70, 72, 74; 128/898, 899; 600/29, 30,
377; 604/20

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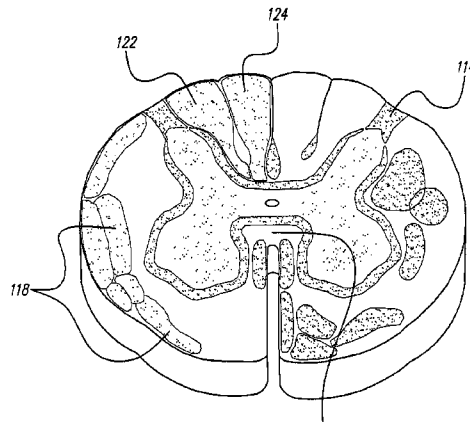
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(57) **ABSTRACT**

An implantable stimulator(s), small enough to be located near or within an area of the spine responsible for sensations in a region experiencing chronic pain uses a power source/storage device, such as a rechargeable battery. Periodic recharging of such a power source/storage device is accomplished, for example, by inductive coupling with an external appliance. The small stimulator provides a means of stimulating a nerve(s) or other tissue when desired, without the need for external appliances during the stimulation session. When necessary, external appliances are used for the transmission of data to and/or from the stimulator(s) and for the transmission of power, it necessary. In a preferred embodiment, the system is capable of open- and closed-loop operation. In closed-loop operation, at least one implant includes at least one sensor, and the sensed condition is used to adjust stimulation parameters.

18 Claims, 8 Drawing Sheets



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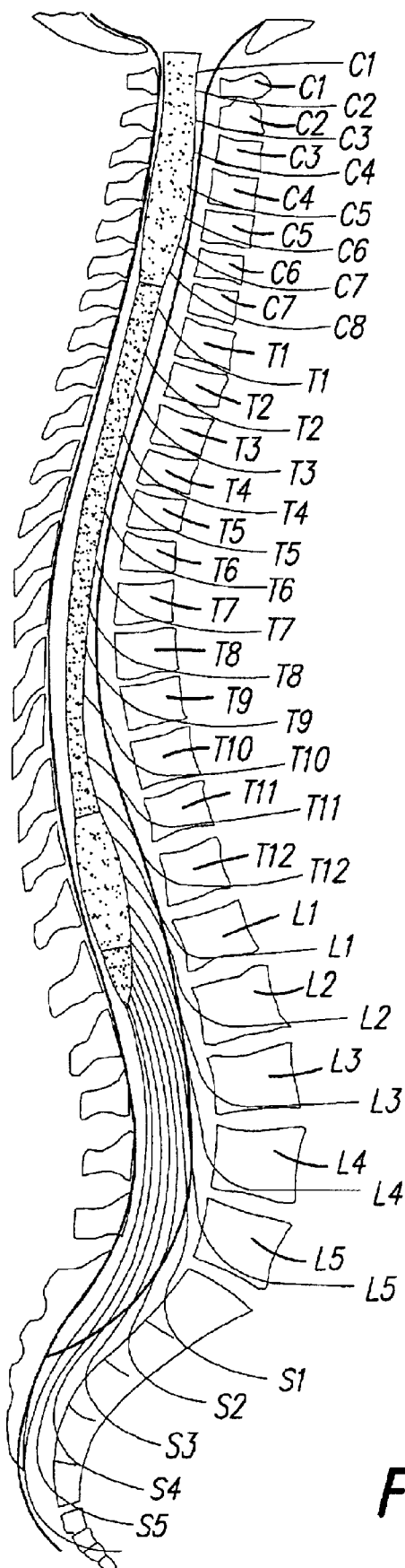
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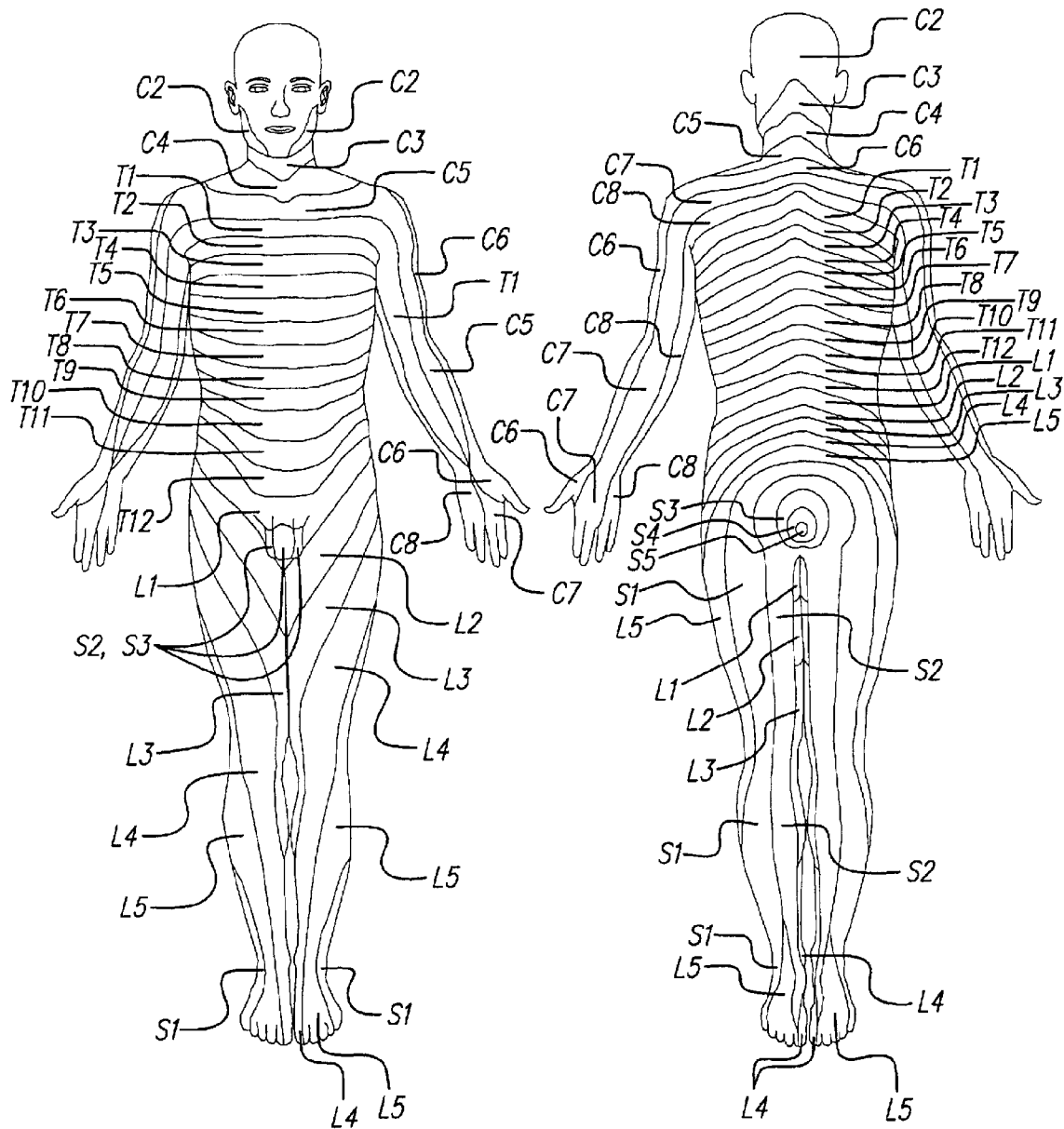
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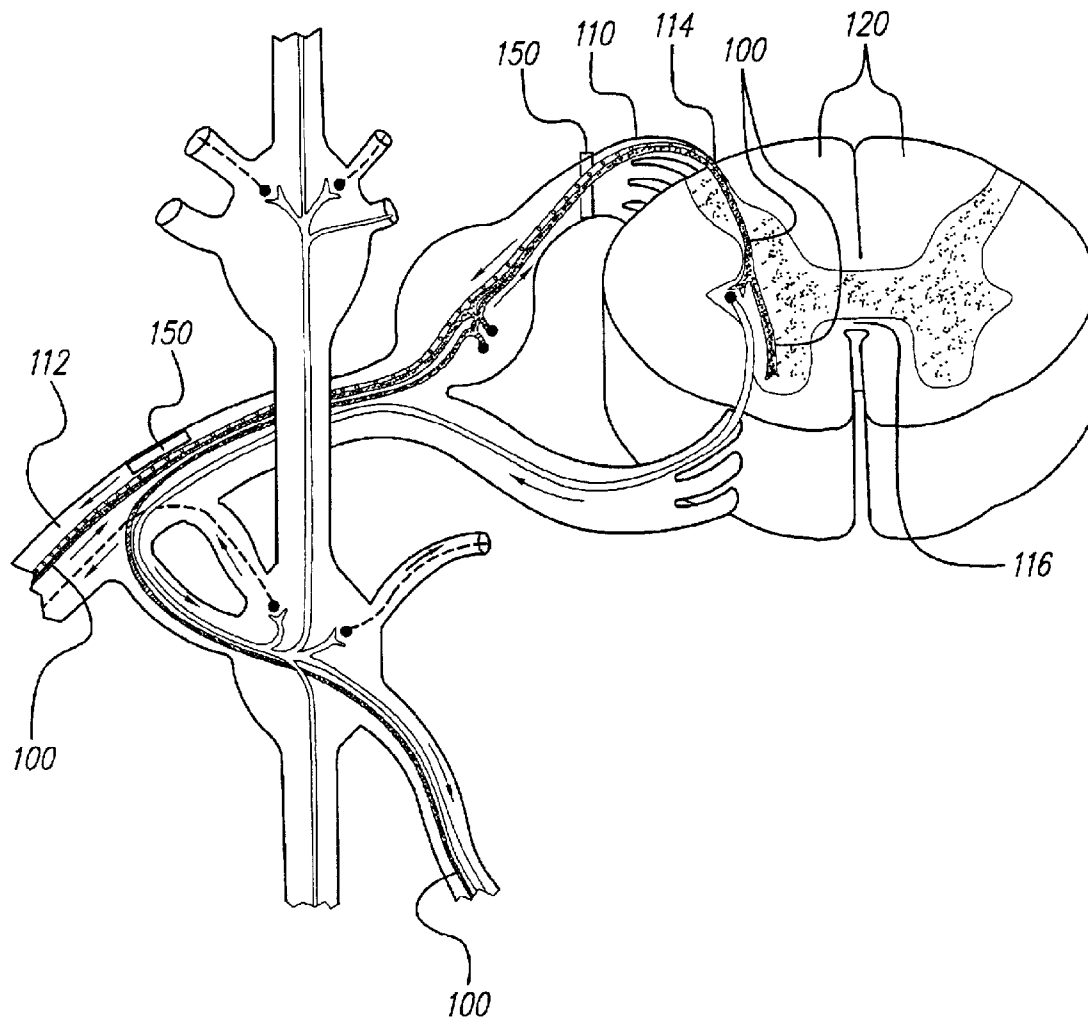
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**FIG. 1A**

**FIG. 1B**

**FIG. 2A**

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