US006745062B1

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

(10) **Patent No.: US 6,745,062 B1**
(45) **Date of Patent: Jun. 1, 2004**

(54) **EMG ELECTRODE APPARATUS AND POSITIONING SYSTEM**

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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.: **09/806,632**

(22) PCT Filed: **Oct. 4, 1999**

(86) PCT No.: **PCT/US99/23033**

§ 371 (c)(1),
(2), (4) Date: **Apr. 2, 2001**

(87) PCT Pub. No.: **WO00/19892**

PCT Pub. Date: **Apr. 13, 2000**

**Related U.S. Application Data**

(60) Provisional application No. 60/103,105, filed on Oct. 4, 1999.

(51) **Int. Cl.**[7] ..... **A61B 5/0492**

(52) **U.S. Cl.** ..... **600/393**; 600/382; 600/391; 600/392; 600/546

(58) **Field of Search** ..... 600/372, 383, 600/392, 393, 546, 391, 382; 607/152, 148, 149, 151

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(57) **ABSTRACT**

A system for detecting and analyzing electrical activity in the anatomy of an organism underlying an electrode array provides signals corresponding to electrical activity adjacent each electrode. Such signals are correlated to the underlying anatomy of the organism and representative outputs presented through various types of output devices. Such outputs may include variations in coloration or other qualities in correspondence with representations of underlying anatomical structures. The system includes novel electrode structures (**200**, **224**, and **284**) and methods for producing and attaching electrode arrays (**240** and **280**) to the organism. The exemplary form of the invention is used in connection with the diagnosis of muscle activity in the lower lumbar regions of humans. Levels of muscle activity detected are analyzed by correlation with the muscular structures underlying the electrode array. Forms of the invention may be used in other applications.

**46 Claims, 35 Drawing Sheets**