



US007024235B2

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

(10) **Patent No.:** **US 7,024,235 B2**

(45) **Date of Patent:** **Apr. 4, 2006**

(54) **SPECIALLY CONFIGURED NASAL PULSE OXIMETER/PHOTOPLETHYSMOGRAPHY PROBES, AND COMBINED NASAL PROBE/CANNULA, SELECTIVELY WITH SAMPLER FOR CAPNOGRAPHY, AND COVERING SLEEVES FOR SAME**

(58) **Field of Classification Search** ..... 600/322-323, 600/344, 310, 340; 128/204.23, 205.23, 128/206.11, 207.18

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 5,005,571 A \* 4/1991 Dietz ..... 128/205.25
- 5,335,656 A \* 8/1994 Bowe et al. .... 600/532
- 5,335,659 A \* 8/1994 Pologe ..... 600/328
- 6,679,265 B1 \* 1/2004 Strickland et al. .... 128/207.18

\* cited by examiner

*Primary Examiner*—Eric F. Winakur

(74) *Attorney, Agent, or Firm*—Timothy H. Van Dyke; Beusse Wolter Sanks Mora & Maire

(75) **Inventors:** **Richard J. Melker**, Gainesville, FL (US); **Joachim S. Gravenstein**, Gainesville, FL (US); **George Worley**, Rowlett, TX (US)

(73) **Assignees:** **University of Florida Research Foundation, Inc.**, Gainesville, FL (US); **Beta Biomed Services, Inc.**, Rowlett, TX (US)

(\* ) **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.:** **10/749,471**

(22) **Filed:** **Dec. 30, 2003**

(65) **Prior Publication Data**

US 2004/0230108 A1 Nov. 18, 2004

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 10/176,310, filed on Jun. 20, 2002, and a continuation-in-part of application No. PCT/US03/19294, filed on Jun. 19, 2003.

(51) **Int. Cl.**  
**A61B 5/00** (2006.01)

(52) **U.S. Cl.** ..... 600/340; 600/344

(57) **ABSTRACT**

The present invention relates to novel nasal pulse oximeter probes that are configured to be placed across the septum of the nose. These probes are fabricated to provide signals to obtain arterial oxygen saturation and other photoplethysmographic data. The present invention also relates to a combined nasal pulse oximeter probe/nasal cannula. The present invention also relates to other devices that combine a pulse oximeter probe with a device supplying oxygen or other oxygen-containing gas to a person in need thereof, and to sampling means for exhaled carbon dioxide in combination with the novel nasal probe. In certain embodiments, an additional limitation of a control means to adjust the flow rate of such gas is provided, where such control is directed by the blood oxygen saturation data obtained from the pulse oximeter probe.

**19 Claims, 28 Drawing Sheets**

