



US008211035B2

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

(10) **Patent No.:** **US 8,211,035 B2**

(45) **Date of Patent:** **Jul. 3, 2012**

(54) **SYSTEM AND METHOD FOR MONITORING HEALTH USING EXHALED BREATH**

(75) Inventors: **Richard J. Melker**, Gainesville, FL (US); **David G. Bjoraker**, Gainesville, FL (US); **Samsun Lampotang**, Gainesville, FL (US)

(73) Assignee: **University of Florida Research Foundation, Inc.**, Gainesville, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1521 days.

(21) Appl. No.: **11/512,856**

(22) Filed: **Aug. 29, 2006**

(65) **Prior Publication Data**

US 2007/0203448 A1 Aug. 30, 2007

Related U.S. Application Data

(63) Continuation of application No. 11/301,911, filed on Dec. 13, 2005, which is a continuation-in-part of application No. PCT/US2005/006355, filed on Feb. 28, 2005, which is a continuation-in-part of application No. 10/788,501, filed on Feb. 26, 2004, now abandoned, which is a continuation-in-part of application No. 10/178,877, filed on Jun. 24, 2002, now Pat. No. 6,981,947, which is a continuation-in-part of application No. 10/054,619, filed on Jan. 22, 2002, now Pat. No. 7,104,963.

(51) **Int. Cl.**
A61B 5/08 (2006.01)
A61M 31/00 (2006.01)

(52) **U.S. Cl.** **600/532**; 604/512

(58) **Field of Classification Search** 600/529-543, 600/484, 483, 481; 128/203.12, 203.14, 128/204.23, 204.18; 604/512

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,567,029 A 3/1971 Quame
3,608,546 A 9/1971 Shinn
3,649,199 A 3/1972 Littlejohn
3,792,272 A 2/1974 Harte et al.
3,877,291 A 4/1975 Hoppesch et al.
3,951,607 A 4/1976 Fraser

(Continued)

FOREIGN PATENT DOCUMENTS

DE 19 607 646 A1 9/1997

(Continued)

OTHER PUBLICATIONS

Hammon III, W. S. et al., "Forensic GPR: Finite-Difference Simulations of Responses From Buried Human Remains," *Journal of Applied Geophysics*, 2000, vol. 45, pp. 171-186.

(Continued)

Primary Examiner — Navin Natnithithadha
(74) *Attorney, Agent, or Firm* — Thomas, Kayden, Horstemeyer & Risley, LLP

(57) **ABSTRACT**

The present invention includes systems and methods for monitoring endogenous compound concentration in blood by detecting markers, such as odors, upon exhalation by a patient, wherein such markers are the endogenous compound itself or result from the endogenous compound. In the case of olfactory markers, the invention preferably utilizes electronic sensor technology, such as the commercial devices referred to as "artificial" or "electronic" noses or tongues, to non-invasively monitor endogenous compound levels in blood. The invention further includes a reporting system capable of tracking endogenous compound concentrations in blood (remote or proximate locations) and providing the necessary alerts with regard to emergent or harmful conditions in a patient.

27 Claims, 9 Drawing Sheets

