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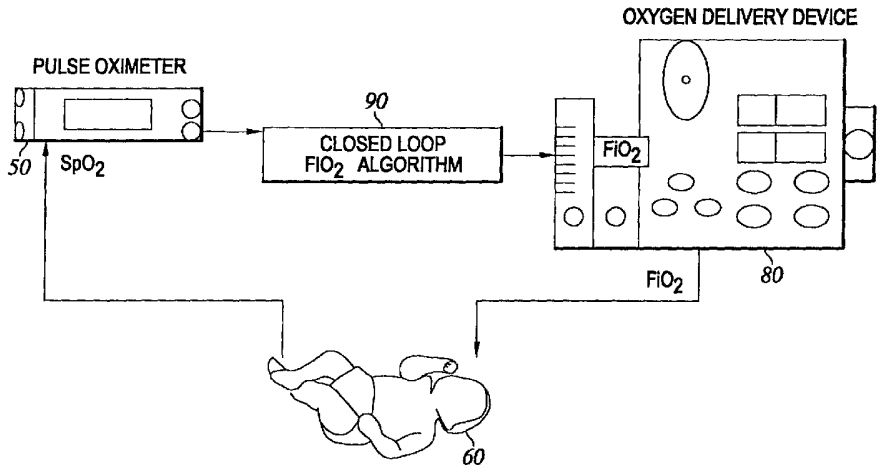
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHOD FOR CLOSED LOOP CONTROLLED INSPIRED OXYGEN CONCENTRATION



(57) Abstract: A system and method for delivering fractionally inspired oxygen (FiO2) to a patient in response to receiving an arterial hemoglobin oxygen saturation signal (SpO2) are disclosed. The SpO2 is measured, for example, by using a pulse oximeter. An algorithm receives a signal indicating the SpO2. The algorithm determines wither the SpO2 is in the normoxemia range, hypoxemia range or hyperoxemia range. The algorithm also determines trends by calculating a slope of second-to-second changes in the SpO2. Based on the current SpO2 and the trend, the algorithm determines the appropriate FiO2 for the patient and instructs a device, such as a mechanical ventilator or an air oxygen mixer as to the appropriate FiO2 to be delivered to the patient. The system initializes various parameters with default values, but a user (e.g., a nurse) can also update the settings at any time. The system also provides alerts for various conditions, for example, standard pulse oximeter alarms, as well as notification when an episode of hyperoxemia or hypoxemia occurs, when it lasts for more than a specified period of time (e.g., two minutes) in spite of FiO2 adjustments and when the adjustments set the FiO2 at certain levels. The user is also alerted when SpO2 signal is lost.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/45135

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61B 5/00

US CL : 600/323

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 600/323, 322, 326, 328; 128/204.22, 204.23, 204.11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	P.E. MOROZOFF & R.W. EVANS. "Closed-loop Control of SaO2 in the Neonate". Biomedical Instrumentation & Technology, vol. 26, pp. 113-123, Mar-Apr 1992.	1-6, 10 and 12-17 --- 7-9, 11 and 13
X --- Y	EAST et al. "Can Pulse Oximetry be used to Reliably Predict Arterial Oxygenation". Pulmonary Division, LDS. Poster presentation for Society of Critical Care Medicine, pp. 1-23, Jan-Feb 1995.	1-6, 10 and 13-17 --- 7-9, 11 and 12
Y	US 6,148,814 A (CLEMMER et al.) 21 November 2000 (21.11.2000), entire document.	1-17
Y	BHUTANI et al. "Adaptive Control in Inspired Oxygen Delivery to the Neonate". Pediatric Pulmonology, vol. 14, pp. 110-117, Oct. 1992.	1-17
Y	RUDOWSKI et al. "Lung Function Analysis and Optimization during Artificial Ventilation. A Persnal Computer-based System". Computer Methods and Programs in Biomedicine, vol. 31, pp. 33-42, Jan. 1990.	1 and 17
Y	US 5,365,922 A (RAEMER) 22 November 1994 (22.11.1994), entire document.	1-17

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Date of the actual completion of the international search	Date of mailing of the international search report
25 June 2002 (25.06.2002)	20 AUG 2002
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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,192,260 B1 (CHANCE) 20 February 2001 (20.02.2001), entire document.	1-17

INTERNATIONAL SEARCH REPORT

International application No.

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Continuation of B. FIELDS SEARCHED Item 3:
PLUS SEARCH, NPL, MEDLINE, EAST BRS, OCR
Key words: fractionally inspired oxygen (FiO2), SpO2, hemoglobin oxygen saturation, algorithm, automatic closed loop, hypoxemic, hyperoxemic, normoxemic, infant, mechanical ventilation.