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(54) Improved pulse oximeter probe-off detector

(57) An intelligent, rule-based processor (300) provides signal quality based limits to the signal strength operating region of a pulse oximeter. These limits are superimposed on the typical gain dependent signal strength limits (314). If a sensor signal appears physiologically generated, the pulse oximeter is allowed to operate with minimal signal strength, maximizing low perfusion performance. If a sensor signal is potentially due to a signal induced by a dislodged sensor, signal strength requirements are raised. Thus, signal quality limitations enhance probe off detection without significantly impacting low perfusion performance. One signal quality measure used is pulse rate density (354), which defines the percentage of time physiologically acceptable pulses are occurring. If the detected signal contains a significant portion of unacceptable pulses, the minimum required signal strength is raised proportionately. Another signal quality measure used in conjunction with pulse rate density is energy ratio (352), computed as the percentage of total energy contained in the pulse rate fundamental and associated harmonics.

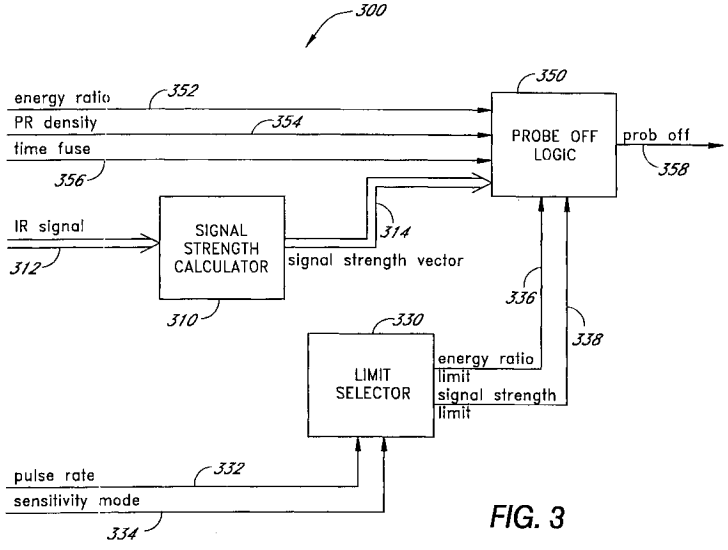

FIG. 3

EP 1 719 449 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 06 01 2571

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	* column 2, line 54 - column 6, line 19; figures 1,3 *	18	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 June 2007	ARTIKIS, T

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 01 2571

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14-06-2007

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	改进的脉搏血氧仪探测器		
公开(公告)号	EP1719449A3	公开(公告)日	2007-08-01
申请号	EP2006012571	申请日	2000-03-24
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IPC分类号	A61B5/00 G01N21/35 A61B5/145 A61B5/1455		
CPC分类号	A61B5/6843 A61B5/14551		
代理机构(译)	法思博事务所		
优先权	60/126148 1999-03-25 US		
其他公开文献	EP1719449B1 EP1719449A2		
外部链接	Espacenet		

摘要(译)

基于规则的智能处理器（300）为脉冲血氧计的信号强度操作区域提供基于信号质量的限制。这些限制叠加在典型的增益相关信号强度限制上（314）。如果生理学上产生传感器信号，则允许脉搏血氧仪以最小信号强度操作，从而最大化低灌注性能。如果传感器信号可能是由移位的传感器引起的信号引起的，则会提高信号强度要求。因此，信号质量限制增强了探针关闭检测，而不会显着影响低灌注性能。使用的一种信号质量测量是脉冲速率密度（354），其定义了生理学上可接受的脉冲发生的时间百分比。如果检测到的信号包含很大一部分不可接受的脉冲，则所需的最小信号强度成比例地增加。与脉率密度结合使用的另一种信号质量测量是能量比（352），计算为脉冲率基波和相关谐波中包含的总能量的百分比。

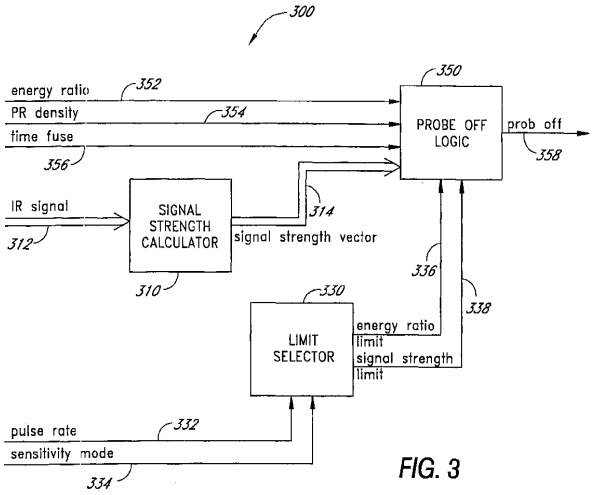

FIG. 3