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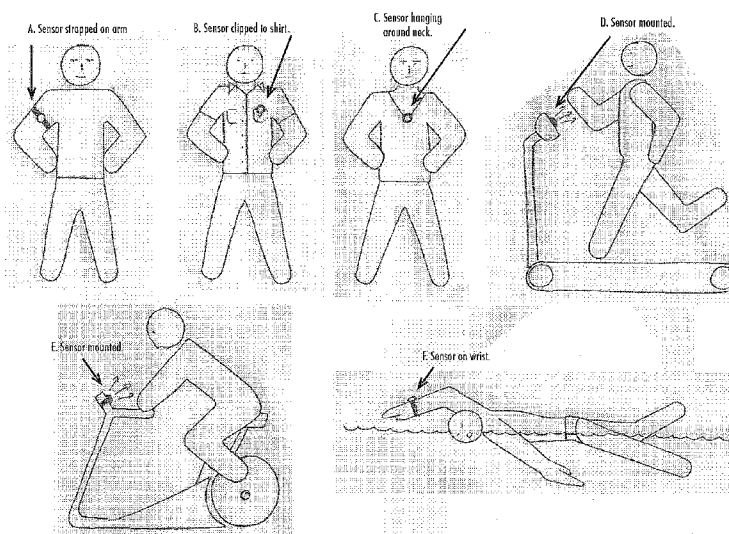
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(54) Title: SYSTEM AND METHOD FOR MONITORING CARDIORESPIRATORY PARAMETERS

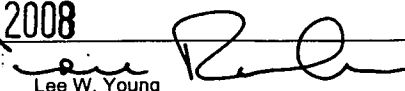


(57) Abstract: An apparatus, system, and method is disclosed for monitoring motion, breathing, heart rate and for deriving and displaying measurements of cardiorespiratory performance from said signals. The signals are obtained through a processing applied to a raw signal obtained in a non-contact fashion, typically using a radio-frequency sensor. Processing into separate cardiac and respiratory components is described. The heart rate can be determined by using spectral or time-domain processing. The respiratory rate can be calculated using spectral analysis. Processing to derive the heart rate, respiratory sinus arrhythmia, or a ventilatory threshold parameter using the system is described. The sensor, processing, and display can be incorporated in a single device which can be worn or held close to the body while exercising or alternately placed in a fixed piece of exercise equipment at some distance from the body, and may be integrated with other sensors, such as position locators.

WO 2008/057883 A3

INTERNATIONAL SEARCH REPORT

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<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G06F 19/00; A61B 5/00 (2008.01) USPC - 705/3; 600/301 According to International Patent Classification (IPC) or to both national classification and IPC</p>																							
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC(8) - G06F 19/00; A61B 5/00 (2008.01) USPC - 705/3; 600/301</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched 600/534</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST(USPT,PGPB,EPAB,JPAB); Google Scholar Search Terms Used: heartbeat, beat, heart rate, respiration, activity, motion, movement, radiofrequency, RF, low frequency motion, high frequency motion, filter, energy content, doppler, ballistocardiography, ballistocardiograph, sinus arrhythmia</p>																							
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 4,513,748 A (NOWOGRODZKI et al.) 30 April 1985 (30.04.1985) Entire document, especially FIG. 1, col 2, ln 2-44 and col.3, ln 1-39.</td> <td>1-6, 8, 9, 11, 12, 16-19, 21, 24 and 28</td> </tr> <tr> <td>Y</td> <td></td> <td>7, 10, 13-15, 20, 22, 23 and 25-27</td> </tr> <tr> <td>Y</td> <td>US 2006/0241510 A1 (HALPERIN et al.) 26 October 2006 (26.10.2006) para[0002] and para[0615].</td> <td>7, 10 and 15</td> </tr> <tr> <td>Y</td> <td>US 2005/0240087 A1 (KEENAN et al.) 27 October 2005 (27.10.2005) Entire document, especially para[0002], para[0079] and para[0129].</td> <td>13, 14, 22, 23, 26 and 27</td> </tr> <tr> <td>Y</td> <td>US 2004/0249296 A1 (ELLSCHIED et al.) 09 December 2004 (09.12.2004) para[0001] and para[0022].</td> <td>20</td> </tr> <tr> <td>Y</td> <td>US 2006/0189924 A1 (BLAKLEY et al.) 24 August 2006 (24.08.2006) para[0001], para[0002] and para[0014].</td> <td>25</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 4,513,748 A (NOWOGRODZKI et al.) 30 April 1985 (30.04.1985) Entire document, especially FIG. 1, col 2, ln 2-44 and col.3, ln 1-39.	1-6, 8, 9, 11, 12, 16-19, 21, 24 and 28	Y		7, 10, 13-15, 20, 22, 23 and 25-27	Y	US 2006/0241510 A1 (HALPERIN et al.) 26 October 2006 (26.10.2006) para[0002] and para[0615].	7, 10 and 15	Y	US 2005/0240087 A1 (KEENAN et al.) 27 October 2005 (27.10.2005) Entire document, especially para[0002], para[0079] and para[0129].	13, 14, 22, 23, 26 and 27	Y	US 2004/0249296 A1 (ELLSCHIED et al.) 09 December 2004 (09.12.2004) para[0001] and para[0022].	20	Y	US 2006/0189924 A1 (BLAKLEY et al.) 24 August 2006 (24.08.2006) para[0001], para[0002] and para[0014].	25
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<p>Date of the actual completion of the international search 06 February 2008 (06.02.2008)</p>		<p>Date of mailing of the international search report 20 MAR 2008</p>																					
<p>Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201</p>		<p>Authorized officer:  Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</p>																					