(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 August 2012 (09.08.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/104658 A3

(51) International Patent Classification:
A61B 5/00 (2006.01) *A61B 5/0456* (2006.01)

(21) International Application Number:
PCT/GB2012/050245

(22) International Filing Date:
3 February 2012 (03.02.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1101858.7 3 February 2011 (03.02.2011) GB

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
8 November 2012

(54) Title: CARDIAC MONITORING DEVICE COMPRISING WEARABLE UNIT

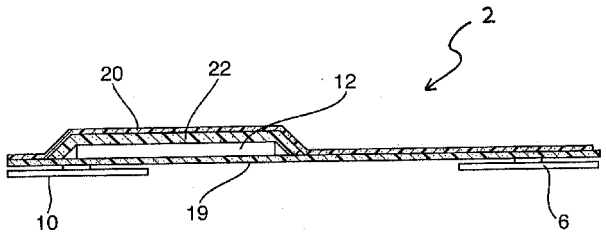

Figure 8

(57) Abstract: Health monitoring devices allow for monitoring of the vital signs of a subject. Wireless devices can enable a subject's cardiac and/or respiratory functions to be monitored remotely e.g. without the subject being attached to bedside equipment. A cardiac monitoring device comprises a substrate (2), electrodes (6,10) for measuring ECG signals, and an electronics module (12) comprising a data processor and a wireless transmitter. The electronics module (12) is sealed within the substrate (2) and arranged to receive the measured ECG signals. Each ECG signal associated with a heartbeat is processed in the data processor to provide key data relating to that heartbeat. The key data may comprise the temporal position of a characteristic feature in the ECG signal. The key data is provided to the wireless transmitter for transmission.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2012/050245

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B5/00 A61B5/0456
ADD.

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)
A61B

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)
EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2010/075115 A2 (PROTEUS BIOMEDICAL INC [US]; ROBERTSON TIMOTHY [US]; OMIDVAR FATANEH [) 1 July 2010 (2010-07-01) paragraphs [0131], [0139], [0140], [0195], [0237] -----	1,2,4, 9-12, 14-19, 35-44, 49-53
X	ESCALONA O ET AL: "An algorithm for microprocessor-based QRS detection", JOURNAL OF CLINICAL ENGINEERING USA, vol. 11, no. 3, May 1986 (1986-05), pages 213-219, XP008150711, ISSN: 0363-8855 page 214, first full paragraph - page 215, first full paragraph page 216, first full paragraph page 218, first full paragraph ----- -/--	1,2, 8-11,40

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 April 2012	05/09/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Knüpling, Moritz

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-4, 39(completely); 8-12, 14-19, 35-38, 40-53(partially)

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2012/050245

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2008/135952 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS CORP [US]; DOUGLAS ALEXAN) 13 November 2008 (2008-11-13) page 6, line 21 - line 23	1,3
A	BHARGAVA V ET AL: "Progress in computer analysis of the exercise electrocardiogram", AMERICAN JOURNAL OF CARDIOLOGY, CAHNERS PUBLISHING CO., NEWTON, MA, US, vol. 47, no. 5, 1 May 1981 (1981-05-01), pages 1143-1151, XP026354587, ISSN: 0002-9149 [retrieved on 1981-05-01] page 1148, section "Purposes"	1
A	WO 97/08989 A1 (CARDIONETICS LIMITED [GB]) 13 March 1997 (1997-03-13) page 36, line 11 - line 21	1
A	CHEN X ET AL: "Reliable automated QT interval measurement for clinical evaluation", COMPUTERS IN CARDIOLOGY - 2006 COMPUTERS IN CARDIOLOGY, CIC 2006 INST. OF ELEC. AND ELEC. ENG. COMPUTER SOCIETY US, vol. 33, 2006, pages 373-376, XP002673725, page 374, column 1, section beginning with "In QRS complex..."	1

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2012/050245

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010075115 A2	01-07-2010	AU 2009330321 A1	14-07-2011
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		US 5749367 A	12-05-1998
		WO 9708989 A1	13-03-1997

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4, 39(completely); 8-12, 14-19, 35-38, 40-53(partially)

   Cardiac monitoring device digitising at 1 kHz

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2. claims: 5-7, 13(completely); 45-48(partially)

   Cardiac monitoring device programmed to run particular algorithm

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3. claims: 20-32

   Cardiac monitoring system comprising network gateway device

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4. claims: 33, 34(completely); 35-38, 40-53(partially)

   Cardiac monitoring device arranged to provide RS amplitude

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