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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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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.

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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))

[Continued on next page]

(54) **Title:** ADVANCED HEALTH MONITORING SYSTEM

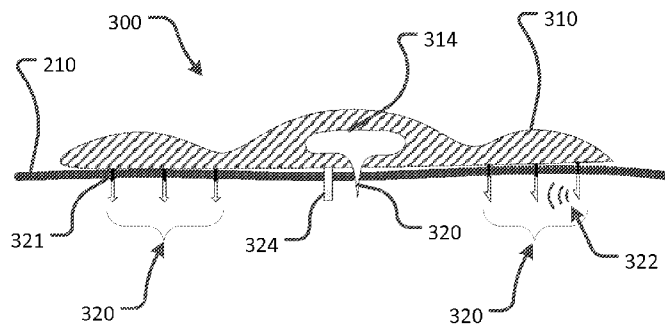


FIG. 3

(57) **Abstract:** Devices and methods provided herein can enhance the operations and efficacy of a remote patient monitoring system. Such devices and methods include using a wearable monitoring device that may comprise non-invasive sensors as well as micro-sensors that are positioned subdermally in some embodiments. In some embodiments, the wearable health parameter monitoring devices include a disposable component and a reusable component that are electrically and mechanically coupled together to create a functioning monitor device.

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26 March 2015

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/45035

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:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-5 and 15-17 are directed toward a device for monitoring health parameters of a patient.

Group II: Claims 6-9, 12-14 and 18-20 are directed toward a system for monitoring health parameters of a patient comprising a computing device.

Group III: Claims 10-11 are directed toward a method of determining and using a preferred anatomical site at which to locate sensors of a health parameter monitoring system on a patient.

-Continued Within the Next Supplemental Box-

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 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.:
1-5, 15-17

- 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/US14/45035

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61B 5/0205, 5/04, 5/0408 (2014.01)
CPC - A61B 5/0205; A61M 35/00; G06F 19/3418
 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)
IPC(8): A61B 5/00, 5/0205, 5/04, 5/0408, 5/08, 5/11, 5/1455; A61M 35/00 (2014.01)
CPC: A61B 5/0205, 5/4818, 5/6832, 5/7282; A61F 13/00; A61M 35/00; G06F 19/3418, 19/3431
 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)
 MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); Google/Google Scholar; ProQuest; Pubmed/Medline: health, patient, medical, physiological, vital, parameter, function, sign, signal, patch, sensors, cradle, interface, coupling, cap, cover, lid, plurality, control, select, less, accelerometer, skin, transdermal, electrocardiogram, display, screen, user

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 8369936 B2 (FARRINGTON, J et al.) February 5, 2013; figure 22; column 47, lines 1-3; column 52, lines 38-58	1, 2, 4 ----- 3, 5, 15-17
Y	US 2008/0033271 A1 (SAY, J et al.) February 7, 2008; figures 14, 17; paragraphs [0077], [0203], [0207]-[0208], [0243]	3
Y	Medtronic Announces Clinical Trial for Breakthrough Technology in Neurostimulation Therapy for Intractable Chronic Pain (MEDTRONIC) May 6, 2010; < ">http://newsroom.medtronic.com/phoenix.zhtml?c=251324&p=irol-newsArticle&ID=1773287&highlight=>	5
Y	US 8116841 B2 (BLY, MJ et al.) February 14, 2012; column 28, lines 8-11	15-17
A	US 2013/0158423 A1 (RJUVEN CORPORATION) June 20, 2013; figure 10; paragraph [0085]	1
A	The Advent of Accelerometers in Home Medical Devices (M2M Embedded Hardware Practice) September 30, 2011; < >	5

Further documents are listed in the continuation of Box C.

* 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 22 October 2014 (22.10.2014)	Date of mailing of the international search report 20 JAN 2015
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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	Authorized officer: Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/45035

-Continued from Box No. III - Observations where unity of invention is lacking-

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical features of Group I include applying the sensor patch to a skin surface of a patient, wherein the sensor patch administers the pharmacological agent to the patient, which are not present in Groups II-III; the special technical features of Group II include a computing device, wherein the computing device is configured to electrically communicate with the control unit when the control unit is not in the cradle and to receive data from the control unit, and wherein the computing device is configured to transmit the data or derivatives of the data to another computing device over a network, which are not present in Groups I and III; the special technical features of Group III include the method comprising: recording health parameter data of the patient from a first anatomical site on the patient to create a first data set; recording health parameter data of the patient from a second anatomical site on the patient to create a second data set; determining whether the anatomical site that is established by the patient's application of the monitoring system to the patient's anatomy is sufficiently similar to the preferred anatomical site, which are not present in Groups I-II.

The common technical features of Groups I, II and III are device for monitoring health parameters of a patient, comprising a sensor patch in contact with a skin surface of the patient, wherein the sensor patch comprises a plurality of sensors for measuring physiologic or pathologic parameters of the patient; a control unit; wherein the control unit is releasably receivable in a cradle of the sensor patch, and wherein the control unit is in electrical communication with the plurality of sensors when the control unit is in the cradle; and a cap, wherein the cap is configured to releasably couple with the sensor patch to detain the control unit in the cradle; and wherein the cap includes a user interface that is configured to provide indications of the functioning of the device.

These common technical features are disclosed by US 2008/0033271 A1 to Say et al. (hereinafter 'Say'). Say discloses device for monitoring health parameters of a patient (levels of an analyte important to a patient's health are monitored; paragraphs [0003], [0069]), comprising a sensor patch in contact with a skin surface of the patient (77; figure 17; paragraphs [0207]-[0208]), wherein the sensor patch comprises a plurality of sensors (sensors 42 are inserted in opening 79; figures 14, 17; paragraphs [0077], [0203]) for measuring physiologic or pathologic parameters of the patient (levels of an analyte important to a patient's health are monitored by 42; paragraphs [0003], [0070]); a control unit (44; figures 14, 17), wherein the control unit is releasably receivable in a cradle of the sensor patch (44 is releasably cradled by 77; figures 17; paragraph [0200]), and wherein the control unit is in electrical communication with the plurality of sensors when the control unit is in the cradle (when 44 contacts 77, contacts 80 of 44 contact pads 49 of the sensor; figures 14, 17; paragraph [0200]); and a cap (76 of housing 45; figure 14, 17; paragraph [0196]), wherein the cap is configured to releasably couple with the sensor patch to detain the control unit in the cradle (45 releasably couples to 77; figures, 17, 28a; paragraph [0208]), and wherein the cap includes a user interface that is configured to provide indications of the functioning of the device (sensor control unit 44 within housing 45 displays the current analyte level to the user; paragraphs [0070]).

Since the common technical features are previously disclosed by the Say reference, the common features are not special and so Groups I, II and III lack unity.