IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 16/158,112	Art Unit: 3792
Filed: October 11, 2016	Confirmation No.: 7079
For: DISCORDANCE MONITORING	

PETITION TO CORRECT INVENTORSHIP UNDER 37 CFR §1.324(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The above-referenced application, now issued as US Patent No. 10,638,941, was originally filed with the following named inventors:

David E. ALBERT
Omar DAWOOD
Ravi GOPALAKRISHNAN

Applicant requests that the inventorship of the patent be corrected to add inventors Fei WANG, Euan THOMSON, and Iman ABUZEID. The inventors are being added to the inventorship information for the above-referenced patent through error without any deceptive intention on the part of the applicant.

In connection with the request to correct inventorship, included herewith are statements from David E. ALBERT, Omar DAWOOD and Ravi GOPALAKRISHNAN the inventors named in the patent, and, Fei WANG, Euan THOMSON, and Iman ABUZEID, the inventors being added to the patent, that the inventorship change is agreed to by each inventor.

Also attached is an executed Consent of Assignee to Change Inventorship and a Statement under 37 CFR 3.73(c).

The processing fee set forth in 37 CFR §1.20(b) is being submitted.

If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 090528. Questions regarding this matter should be directed to the undersigned at (408) 341-3091.

Respectfully submitted,

WOMBLE BOND DICKINSON (US) LLP

Date: November 25, 2020

/Bill Jacobs/

William D. Jacobs, Jr.
Reg. No. 74,758

1841 Page Mill Road
Suite 200
Palo Alto, CA 94304
Telephone (408) 341-3091

DECLARATION (37 CFR 1.63) AND ASSIGNMENT FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DISCORDANCE MONITORING

This declaration and assignment is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/154,849 filed on May 13, 2016 .

DECLARATION

As a below named inventor, I hereby declare that:

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

ASSIGNMENT

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the undersigned, hereby sell, assign, and transfer to AliveCor, Inc.

a corporation of Delaware ,

(Type of Assignee: e.g., corporation, company, partnership, university, etc.),

having a principal place of business at 444 Castro St., Ste 600, Mountain View, CA 94041,

("Assignee"), and its successors, assigns, and legal representatives, the entire right, title, and interest for the United States and all foreign countries, in and to any and all inventions or improvements that are disclosed in the above identified application and in and to said application (provisional or non-provisional) and all provisional applications, non-provisional applications, utility applications, design applications, divisional applications, continuation applications, continued prosecution applications, continuation-in-part applications, substitute applications, renewal applications, reissue applications, reexaminations, extensions, and all other patent applications that have been or shall be filed in the United States

and all foreign countries on any of said inventions or improvements; and in and to all original patents, reissued patents, reexamination certificates, and extensions, that have been or shall be issued in the United States and all foreign countries on said inventions or improvements; and in and to all rights of priority resulting from the filing of said application;

agree that said Assignee may apply for and receive a patent or patents for said inventions or improvements in its own name; and that, when requested, without charge to, but at the expense of, said Assignee, its successors, assigns, and legal representatives, to carry out in good faith the intent and purpose of this Assignment, the undersigned will execute all provisional applications, non-provisional applications, utility applications, design applications, divisional applications, continuation applications, continued prosecution applications, continuation-in-part applications, substitute applications, renewal applications, reissue applications, reexaminations, extensions, and all other patent applications on any and all said inventions or improvements; execute all rightful oaths, assignments, powers of attorney, and other papers; communicate to said Assignee, its successors, assigns, and representatives all facts known to the undersigned relating to said inventions or improvements and the history thereof; and generally assist said Assignee, its successors, assigns, or representatives in securing and maintaining proper patent protection for said inventions or improvements and for vesting title to said inventions or improvements, and all applications for patents and all patents on said inventions or improvements, in said Assignee, its successors, assigns, and legal representatives; and

covenant with said Assignee, its successors, assigns, and legal representatives that no assignment, grant, mortgage, license, or other agreement affecting the rights and property herein conveyed has been made to others by the undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

LEGAL NAME OF INVENTOR

Inventor: Fei Wang Date: 10/9/2020 | 2:41 PM PDT

Signature: DocuSigned by: Fei WANG 0A7039A70331427...

LEGAL NAME OF INVENTOR

Inventor: Euan Thomson Date: 10/11/2020 | 8:17 AM PDT

Signature: DocuSigned by: Euan Thomson 8D5B605AD1764C4...

LEGAL NAME OF INVENTOR

Inventor: Iman Abuzeid Date: 10/14/2020 | 9:08 PM PDT

Signature: DocuSigned by: Iman Abuzeid A843EB6D18754DE...

IN THE U.S. PATENT AND TRADEMARK OFFICE

Application No.: 15/154,849 **Patent No.:** 9,839,363	**Confirmation No.** 1083
Application of: David E. ALBERT	**Group Art Unit:** 3766
Filing Date: May 13, 2016	**Examiner:** Tejani, Ankit D.
Title: DISCORDANCE MONITORING	**Docket No.** A102992 1200US.1 **Customer No.** 151512

Consent of Assignee AliveCor, Inc. to Change Inventorship
Submitted in Support of Petition under 37 CFR 1.324

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

1. AliveCor, Inc. is the 100% owner of the above-identified granted US Patent, which currently names David E. Albert, Omar Dawood, and Ravi Gopalakrishnan as the inventors.

2. A Statement under 37 CFR 3.73(c) establishing ownership is being concurrently submitted.

3. AliveCor, Inc. agrees to change in inventorship of the patent, and consents to have Fei Wang, Euan Thomson, and Iman Abuzeid added as inventors.

4. The undersigned is authorized to act on behalf of AliveCor, Inc. in this matter.

Date 10/22/2020

DocuSigned by:
Brian Clarke
60C360E4AC0D441...

Brian Clarke
General Counsel

Attorney's Docket No. A102992 1200US.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 15/154,849	Art Unit: 3766
Filed: May 13, 2016	Confirmation No.: 1083
For: DISCORDANCE MONITORING	

37 CFR §1.324(b) STATEMENT BY IMAN ABUZEID

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Iman ABUZEID, was not initially named as an inventor on the above-referenced application, now issued as US Patent No. 9,839,363, as originally filed. I agree to the change of inventorship as reflected in the accompanying Petition to Correct Inventorship under 37 CFR §1.324(b).

Respectfully submitted,

Date: 10/14/2020 | 9:08 PM PDT

DocuSigned by:
Iman Abuzeid
A843EB6D18754DE...

Iman ABUZEID

Attorney's Docket No. A102992 1200US.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 15/154,849	Art Unit: 3766
Filed: May 13, 2016	Confirmation No.: 1083
For: DISCORDANCE MONITORING	

37 CFR §1.324(b) STATEMENT BY FEI WANG

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Fei WANG, was not initially named as an inventor on the above-referenced application, now issued as US Patent No. 9,839,363, as originally filed. I agree to the change of inventorship as reflected in the accompanying Petition to Correct Inventorship under 37 CFR §1.324(b).

Respectfully submitted,

Date: 10/9/2020 | 2:41 PM PDT

DocuSigned by:
Fei WANG
0A7039A70331427...

Fei WANG

Attorney's Docket No. A102992 1200US.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 15/154,849	Art Unit: 3766
Filed: May 13, 2016	Confirmation No.: 1083
For: DISCORDANCE MONITORING	

37 CFR §1.324(b) STATEMENT BY EUAN THOMSON

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Euan THOMSON, was not initially named as an inventor on the above-referenced application, now issued as US Patent No. 9,839,363, as originally filed. I agree to the change of inventorship as reflected in the accompanying Petition to Correct Inventorship under 37 CFR §1.324(b).

Respectfully submitted,

Date: 10/11/2020 | 8:17 AM PDT

DocuSigned by:
Euan Thomson
8D5B605AD1764C4...

Euan THOMSON

Attorney's Docket No. A102992 1200US.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 15/154,849	Art Unit: 3766
Filed: May 13, 2016	Confirmation No.: 1083
For: DISCORDANCE MONITORING	

37 CFR §1.324(b) STATEMENT BY RAVI GOPALAKRISHNAN

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Ravi Gopalakrishnan, was named as an inventor on the above-referenced application, now issued as US Patent No. 9,839,363, as originally filed. I agree to the change of inventorship as reflected in the accompanying Petition to Correct Inventorship under 37 CFR §1.324(b).

Respectfully submitted,

Date: 10/8/2020 | 7:34 PM PDT

48B5C77D1FF8B48D
Ravi Gopalakrishnan
DocuSigned By: Ravi Gopalakrishnan

Ravi Gopalakrishnan

Attorney's Docket No. A102992 1200US.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 15/154,849	Art Unit: 3766
Filed: May 13, 2016	Confirmation No.: 1083
For: DISCORDANCE MONITORING	

37 CFR §1.324(b) STATEMENT BY OMAR DAWOOD

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Omar Dawood, was named as an inventor on the above-referenced application, now issued as US Patent No. 9,839,363, as originally filed. I agree to the change of inventorship as reflected in the accompanying Petition to Correct Inventorship under 37 CFR §1.324(b).

Respectfully submitted,

Date: 10/8/2020 | 7:20 PM PDT

DocuSigned by:
Omar Dawood
B93D2ACB5D8F40B...

Omar Dawood

Attorney's Docket No. A102992 1200US.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. ALBERT et al.	Examiner: Tejani, Ankit D.
Application No. 15/154,849	Art Unit: 3766
Filed: May 13, 2016	Confirmation No.: 1083
For: DISCORDANCE MONITORING	

37 CFR §1.324(b) STATEMENT BY DAVID E. ALBERT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, David E. ALBERT, was named as an inventor on the above-referenced application, now issued as US Patent No. 9,839,363, as originally filed. I agree to the change of inventorship as reflected in the accompanying Petition to Correct Inventorship under 37 CFR §1.324(b).

Respectfully submitted,

Date: 10/8/2020 | 7:26 PM PDT

DocuSigned by:
David Albert
500FDF9B079844A...

David E. Albert

Electronic Patent Application Fee Transmittal

Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
PROCESSING FEE CORRECTING INVENTORSHIP	1816	1	160	160

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Electronic Acknowledgement Receipt	
EFS ID:	41231481
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	25-NOV-2020
Filing Date:	11-OCT-2018
Time Stamp:	17:54:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$160
RAM confirmation Number	E2020AOH54598238
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition for review by the Office of Petitions	A102992_1200USC2_Petition_Correct_Inv.pdf	66744 57c5a647342cd3c83da5ff7f7cebf128a4b2df57	no	2
Warnings:					
Information:					
2	Oath or Declaration filed	A102992_1200USC2_Declaration.pdf	126208 4c7f2dc280793bb68a5fea13d48b763f466d887c	no	2
Warnings:					
Information:					
3	Consent of Assignee accompanying the declaration	A102992_1200USC2_Consent_Assignee.pdf	111340 dbc7b03e284e6312c2b6b03a1923bd5b65558d5e	no	1
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	A102992_1200USC2_Statement_Abuzeid.pdf	85603 2223f2c2856dbc48a073086741df6b33944e734f	no	1
Warnings:					
Information:					
5	Other Reference-Patent/App/Search documents	A102992_1200USC2_Statement_Wang.pdf	85245 f4613bcc565c18ed0c9b0810698df1ad5ef5a862	no	1
Warnings:					
Information:					
6	Other Reference-Patent/App/Search documents	A102992_1200USC2_Statement_Thomson.pdf	84866 90722bcdf14f3fcf16aa271b2999619fdc1e8f21	no	1
Warnings:					
Information:					

7	Other Reference-Patent/App/Search documents	A102992_1200USC2_Statement_Gopalakrishnan.pdf	83701 0fbbf395121006c40e7fd2b985bbe083035d32a9	no	1
Warnings:					
Information:					
8	Other Reference-Patent/App/Search documents	A102992_1200USC2_Statement_Dawood.pdf	86167 aa9f650333eeb15abe809fb7ccf629c088d100b6	no	1
Warnings:					
Information:					
9	Other Reference-Patent/App/Search documents	A102992_1200USC2_Statement_Albert.pdf	86791 97573750d722156fac9d69a55e7f908f9af137a6	no	1
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	30448 a073cff0443ef1d29c192f774f4e38ba6dba6f0b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	847113		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	05/05/2020	10638941	A102992 1200US.C2	7079

151512 7590 04/15/2020

WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

David E. Albert, Oklahoma City, OK;
AliveCor, Inc., Residence Not Provided;
Omar Dawood, San Francisco, CA;
Ravi Gopalakrishnan, San Francisco, CA;

IR103 (Rev. 10/09)

Doc Code: IFEE PTOL/85B-EFS

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
16158112	11-Oct-2018	David Albert	A102992 1200US.C2	7079

TITLE OF INVENTION :

DISCORDANCE MONITORING

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Regular Undiscounted	Utility under 35 USC 111(a)	3792	516000	ANKIT TEJANI

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$1000	$0	$1000	03-Jun-2020	$0

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
151512 WOMBLE BOND DICKINSON (US) LLP/AliveCor Attn: IP DOCKETING P.O. BOX 7037 ATLANTA GA 30357-0037 UNITED STATES 404-872-7000 IPDocketing@wbd-us.com	
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☐ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status

Change in Entity Status

○ Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment. If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.

○ Applicant asserting small entity status. See 37 CFR 1.27.
Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

◉ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

Doc Code: IFEE PTOL/85B-EFS

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☒ Issue Fee	☐ I authorize USPTO to apply my previously paid issue fee to the current fees due
☐ Publication Fee	☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____
☐ Advance Order - # of copies _____	☒ If i**n addition to** the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency, or credit any overpayment, to Deposit Account Number 090528 . The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1. WOMBLE BOND DICKINSON (US) LLP
2. WILLIAM D. JACOBS, JR.
3.

5.Assignee Name(s) and Residence Data To Be Printed

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

Name	City	State	Country	Category
AliveCor, Inc.	Mountain View	CALIFORNIA	united states	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Bill Jacobs/	**Date**	03-27-2020
Name	William D. Jacobs, Jr.	**Registration Number**	74758

WEB IFEE 1.0

Electronic Patent Application Fee Transmittal

Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt	
EFS ID:	38997020
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	27-MAR-2020
Filing Date:	11-OCT-2018
Time Stamp:	19:03:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1000
RAM confirmation Number	E20203QJ03231575
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.20 (Post Issuance fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Web85b.pdf	46236 4833f43bb5ce9da094f839dd2880d43f7eb14f5b	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32047 508a7896429c1d76cea8a6b87fe2b9c1fc4a430a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	78283		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

151512 7590 03/03/2020

WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER
TEJANI, ANKIT D

ART UNIT	PAPER NUMBER
3792	

DATE MAILED: 03/03/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

TITLE OF INVENTION: DISCORDANCE MONITORING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	06/03/2020

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

151512 7590 03/03/2020
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

TITLE OF INVENTION: DISCORDANCE MONITORING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	06/03/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
TEJANI, ANKIT D	3792	600-516000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

151512 7590 03/03/2020

WOMBLE BOND DICKINSON (US) LLP/AliveCor
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P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
TEJANI, ANKIT D	
ART UNIT	**PAPER NUMBER**
3792	

DATE MAILED: 03/03/2020

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/158,112	Applicant(s) Albert et al.	
	Examiner ANKIT D TEJANI	Art Unit 3792	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to AFCP 2.0 Request and eTD's dated 02/20/2020.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-6,10-15 and 19-29 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/ANKIT D TEJANI/
Primary Examiner, Art Unit 3792

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert et al.
	Examiner	Art Unit
	ANKIT D TEJANI	3792

CPC						
Symbol					Type	Version
A61B	/	5	/	0205	F	2013-01-01
A61B	/	5	/	7267	I	2013-01-01
A61B	/	5	/	681	I	2013-01-01
A61B	/	5	/	02405	A	2013-01-01
A61B	/	5	/	02438	A	2013-01-01
A61B	/	2562	/	0219	A	2013-01-01
A61B	/	5	/	1118	A	2013-01-01
A61B	/	5	/	046	A	2013-01-01
A61B	/	5	/	0464	A	2013-01-01
A61B	/	5	/	04085	A	2013-01-01

CPC Combination Sets							
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/ANKIT D TEJANI/ Primary Examiner, Art Unit 3792	25 February 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office — Part of Paper No.: 20200225

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert et al.
	Examiner	**Art Unit**
	ANKIT D TEJANI	3792

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A61B	/	5	/	02

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
600	516

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/ANKIT D TEJANI/ Primary Examiner, Art Unit 3792	25 February 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office — Part of Paper No.: 20200225

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert et al.
	Examiner	**Art Unit**
	ANKIT D TEJANI	3792

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	12	10	18	19	10	28								
2	2	13	11	19	20	11	29								
3	3	14	12	20	21										
4	4	15	13	21	22										
5	5	16	14	22	23										
6	6	17	15	23	24										
	7		16	7	25										
	8		17	8	26										
	9		18	9	27										

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/ANKIT D TEJANI/ Primary Examiner, Art Unit 3792	25 February 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office Part of Paper No.: 20200225

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert et al.
	Examiner	Art Unit
	ANKIT D TEJANI	3792

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61B5/0205,02405,02438,04085,046,0464,1118,681,7267 (keyword text search)	02/25/2020	ADT

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
PALM (inventor search)	02/25/2020	ADT
EAST (search history attached)	02/25/2020	ADT

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	US-PGPUB, US-PAT claims text search	02/25/2020	ADT

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert et al.
	Examiner	Art Unit
	ANKIT D TEJANI	3792

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	01/15/2019	09/25/2019	02/11/2020	02/25/2020					
1	1	÷	✓	✓	=					
2	2	÷	✓	✓	=					
3	3	÷	✓	✓	=					
4	4	÷	✓	✓	=					
5	5	÷	✓	✓	=					
6	6	÷	✓	✓	=					
	7	÷	-	-	-					
	8	÷	-	-	-					
	9	-	-	-	-					
12	10	÷	✓	✓	=					
13	11	÷	✓	✓	=					
14	12	÷	✓	✓	=					
15	13	÷	✓	✓	=					
16	14	÷	✓	✓	=					
17	15	÷	✓	✓	=					
	16	÷	-	-	-					
	17	÷	-	-	-					
	18	-	-	-	-					
18	19		✓	✓	=					
19	20		✓	✓	=					
20	21		✓	✓	=					
21	22		✓	✓	=					
22	23		✓	✓	=					
23	24		✓	✓	=					
7	25		✓	✓	=					
8	26		✓	✓	=					
9	27		✓	✓	=					
10	28		✓	✓	=					
11	29		✓	✓	=					

PLEASE ENTER
/ADT/
25 FEBRUARY 2020

Attorney Docket No. **A102992 1200US.C2** Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
David E. Albert	EXAMINER: TEJANI, ANKIT D.
Serial No. 16/158,112	ART UNIT: 3792
Filed: October 11, 2018	CONF NO.: 7079
For: DISCORDANCE MONITORING	

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

AMENDMENTS AND RESPONSE TO FINAL OFFICE ACTION
AND AFCP 2.0 REQUEST

Sir:

In response to the final Office Action mailed on February 18, 2020, Applicant respectfully requests the Examiner to consider the following amendments and remarks. Please note that Terminal Disclaimers are filed herewith.

A listing of claims begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	9	("20120109675" | "20120289790" | "20140163393" | "20150057512" | "20150305684" | "7846106").PN. ("20140125619" "20120197148" "20070213624").pn.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L2	26074	(A61B5/0205,02405,02438,04085,046,0464,1118,681,7267).CPC.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L3	2	("20140276154" "20130281816").pn.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L4	660	(albert with david).in.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L5	59	(albert with david).in. AND alivecor	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L6	171	alivecor	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L7	274	(smartwatch watch wristlet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L8	4	(smartwatch watch wristlet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND discord$4 AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L9	283	(smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L10	274	(smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND (correlat$3 discord$4 correspond$4) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L11	26074	(A61B5/0205,02405,02438,04085,046,0464,1118,681,7267).CPC.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L12	154	L2 AND (smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND (correlat$3 discord$4 correspond$4) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L13	2	("20140276154" "20130281816").pn.	US-PGPUB;	OR	ON	2020/02/25 13:53

			USPAT; USOCR			
L14	159	L2 AND (smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L15	4620	(heart with rate) same (movement displacement activity motion) same (discord$5 correlat$4)	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L16	1800	L2 AND L15	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L17	746	L16 AND ($5arrhythmia $5cardia) AND (electrocardiogra$3 ecg ekg)	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53
L18	362	L16 AND ($5arrhythmia $5cardia) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/25 13:53

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L20	308	(heart with rate).clm. AND (activity motion exercise movement).clm. AND (discord$3 conflict disagree$4 differ$5).clm. AND ($5arrhythmia $5cardia).clm.	US-PGPUB; USPAT	OR	ON	2020/02/25 14:09
L21	5	(heart with rate).clm. AND (activity motion exercise movement).clm. AND (discord$3 conflict disagree$4 differ$5).clm. AND ($5arrhythmia $5cardia).clm. AND (smart$).clm.	US-PGPUB; USPAT	OR	ON	2020/02/25 14:11
L22	78	(heart with rate).clm. AND (activity motion exercise movement).clm. AND (discord$3 conflict disagree$4 differ$5).clm. AND ($5arrhythmia $5cardia).clm. AND (electrocardiogra$3 ekg ecg).clm.	US-PGPUB; USPAT	OR	ON	2020/02/25 14:11

02/25/2020 14:32:06
C:\Users\atejani\Documents\EAST\Workspaces\16158112.wsp

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2

CONFIRMATION NO. 7079

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

37 CFR 1.48 ACKNOWLEDGEMENT LETTER

OC000000114938092

Date Mailed: 02/25/2020

NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(a)

This is in response to the applicant's request under 37 CFR 1.48(a) submitted on 02/20/2020.

The request under 37 CFR 1.48(a) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/hsarwari/

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2

CONFIRMATION NO. 7079

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

POA ACCEPTANCE LETTER

OC00000014937764

Date Mailed: 02/25/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/20/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/hsarwari/

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/158,112	10/11/2018	3792	2020	A102992 1200US.C2	16	2

CONFIRMATION NO. 7079

UPDATED FILING RECEIPT

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

OC000000114938091

Date Mailed: 02/25/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

David E. Albert, Oklahoma City, OK;
Omar Dawood, San Francisco, CA;
Ravi Gopalakrishnan, San Francisco, CA;

Applicant(s)

AliveCor, Inc., Residence Not Provided;

Power of Attorney: The patent practitioners associated with Customer Number 151512

Domestic Priority data as claimed by applicant

This application is a CON of 15/656,745 07/21/2017 PAT 10537250
which is a CON of 15/154,849 05/13/2016 PAT 9839363
which claims benefit of 62/161,092 05/13/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

DISCORDANCE MONITORING

Preliminary Class

600

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
* 16/158,112 *	16/158,112	Albert et al.	
	Examiner	**Art Unit**	
	TEJANI, ANKIT D	3792	

Document Code - DISQ	**Internal Document - DO NOT MAIL**

TERMINAL DISCLAIMER	☑ APPROVED	☐ DISAPPROVED
Date Filed: **20 February 2020**	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

/TRINA STEPTOE/

Technology Center: OPLC

Telephone: (571)272-2577

2 TD`s

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: David E. Albert Serial No. 16/158,112 Filed: October 11, 2018 For: DISCORDANCE MONITORING	EXAMINER: TEJANI, ANKIT D. ART UNIT: 3792 CONF NO.: 7079

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

AMENDMENTS AND RESPONSE TO FINAL OFFICE ACTION
AND AFCP 2.0 REQUEST

Sir:

In response to the final Office Action mailed on February 18, 2020, Applicant respectfully requests the Examiner to consider the following amendments and remarks. Please note that Terminal Disclaimers are filed herewith.

A listing of claims begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

IN THE CLAIMS

1. (Currently amended) A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor on a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor on the smartwatch;

determining, by a processing device, that a discordance is present between the activity level value and the heart rate parameter;

based on the presence of the discordance, indicating to the user, using the smartwatch, a possibility of an arrhythmia being present; and

receiving electric signals of the user from an electrocardiogram sensor ("ECG") on the smartwatch to confirm a presence of the arrhythmia, wherein the ECG sensor comprises a first electrode and a second electrode.

2. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

3. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

4. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

5. (Previously presented) The method according to claim 1, wherein indicating to the user further comprises: instructing the user to record an ECG using the smartwatch.

6. (Previously presented) The method according to claim 1, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Currently amended) A smartwatch, comprising:

a processor;

a first sensor configured to sense an activity level value of a user, wherein the first sensor is coupled to the processor;

a photoplethysmogram ("PPG") sensor configured to sense a heart rate parameter of the user when the activity level value is resting, wherein the PPG sensor is coupled to the processor;

an electrocardiogram ("ECG") sensor configured to sense electrical signals of a heart, wherein the ECG sensor comprises a first electrode and a second electrode, and wherein the ECG sensor is coupled to the processor; and

a non-transitory computer readable storage medium encoded with a computer program including instructions executable by the processor to cause the processor to:

determine if a discordance is present between the activity level value of the user and the heart rate parameter of the user;

based on the presence of the discordance, indicate to the user a possibility of an arrhythmia being present; and

receive electric signals of the user from the ECG sensor to confirm the presence of the arrhythmia.

11. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

12. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

13. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate value, and wherein the arrhythmia is atrial fibrillation.

14. (Previously presented) The smartwatch or wristlet according to claim 10, wherein indicating to the user further comprises: instructing the user to record an ECG using the ECG sensor.

15. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraentricular tachycardia, and ventricular tachycardia.

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Currently amended) The smartwatch according to claim 10, wherein the heart rate parameter is a PPG signal.

20. (Currently amended) The smartwatch according to claim 19, wherein the heart_-rate parameter is a heartrate variability ("HRV") value, wherein the HRV value is derived from the PPG signal.

21. (Currently amended) The smartwatch according to claim 19, wherein the heart rate parameter is a heartrate, wherein the heartrate is derived from the PPG signal.

22. (Previously presented) The smartwatch according to claim 10, the processor further to: display an ECG rhythm strip from the electric signals.

23. (Currently amended) The smartwatch according to claim 10, wherein the PPG sensor is located on [[the]]a back of the smartwatch.

24. (Previously presented) The smartwatch according to claim 10, wherein the first electrode is located on the smartwatch where the first electrode contacts a first side of the user's body while the user wears the smartwatch, and the second electrode is located on the smartwatch where the user must actively contact the second electrode with a second side of the user's body opposite from the first side.

25. (Currently amended) The method according to claim 1, wherein the heart_rate parameter is a PPG signal.

26. (Currently amended) The ~~smartwatch~~method according to claim 25, wherein the heart_rate parameter is a heartrate variability ("HRV") value, wherein the HRV value is derived from the PPG signal.

27. (Currently amended) The ~~smartwatch~~method according to claim 25, wherein the heart_rate parameter is a heartrate, wherein the heartrate is derived from the PPG signal.

28. (Currently amended) The ~~smartwatch~~method according to claim[[s]] 1 further comprising:

displaying an ECG rhythm strip from the electric signals on the smartwatch.

29. (Currently amended) The ~~smartwatch~~method according to claim 1, wherein the first electrode is located on the smartwatch in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch, and the second electrode is located on the smartwatch in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side.

REMARKS

Applicant respectfully requests reconsideration of this application in view of the amendments and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in substantially the same order in which the corresponding issues were raised in the Office action.

Please note that the claim amendments included herein are not substantive in nature, and are merely to clean up the claim language in preparation for issuance.

Status of the Claims

Claims 1-6, 10-15 and 19-29 are pending. Claims 1, 10, 19-21, 23, and 25-29 are currently amended. No claims are added in the current amendment. No new matter has been added.

Summary of the Office action

Claims 1-6, 10-15, 19-21, and 25-27 are rejected on the ground of nonstatutory double patenting as allegedly being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363.

Claims 22-24, 28 and 29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363 in view of Yuen and Katra.

Claims 1, 5, 10, and 14 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 10,537,250.

Claims 2-4, 6, 11-13, 15, and 19-29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 10,537,250 in view of Yuen and Katra.

Response to Double Patenting Rejections

Please note that terminal disclaimers have been filed herewith. As such, Applicant respectfully requests that the double patenting rejections be withdrawn.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. A notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 341-3091. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 09-0528.

Should the Examiner have any questions concerning this matter, please contact the undersigned.

Respectfully submitted,

WOMBLE BOND DICKINSON (US) LLP

Date: February 20, 2020

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

1841 Page Mill Road
Suite 200
Palo Alto, CA 94304
(408) 341-3091

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
A102992 1200US.C2	16/158,112	October 11, 2018
First Named Inventor:	**Title:**	
David E. Albert	DISCORDANCE MONITORING	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:

- Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
- The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
  - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
  - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
    - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
    - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Bill Jacobs/	February 20, 2020
Name (Print/Typed) William D. Jacobs, Jr.	**Practitioner Registration No.** 74,758

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

[✓] * Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/26 (04-14)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) A102992 1200US.C2

In re Application of: David E. Albert

Application No.: 16/158,112

Filed: October 11, 2018

For: DISCORDANCE MONITORING

The applicant, ALIVECOR, INC., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 10,537,250 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 74,758

/Bill Jacobs/ — Signature
February 20, 2020 — Date

William D. Jacobs, Jr. — Typed or printed name

Attorney of Record — Title
(408) 341-3091 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
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PTO/AIA/26 (04-14)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) A102992 1200US.C2

In re Application of: David E. Albert

Application No.: 16/158,112

Filed: October 11, 2018

For: DISCORDANCE MONITORING

The applicant, ALIVECOR, INC., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,839,363 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 74,758

/Bill Jacobs/ — Signature
February 20, 2020 — Date

William D. Jacobs, Jr. — Typed or printed name

Attorney of Record — Title
(408) 341-3091 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Corrected Application Data Sheet

Application Information

Application Number::	16/158,112
Filing Date::	October 11, 2018
Application Type::	Nonprovisional
Subject Matter::	Utility
Title::	DISCORDANCE MONITORING
Attorney Docket Number::	A102992 1200US.C2
Request for Early Publication?::	No
Request for Non-Publication?::	No
Total Drawing Sheets::	7

Inventor Information

Inventor Number::	1
Given Name::	David
Middle Name::	E.
Family Name::	Albert
City of Residence::	Oklahoma City
State of Residence::	OK
Country of Residence::	US
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City of mailing address::	Mountain View
State of mailing address::	CA
Postal or Zip Code of mailing address::	94041
Country of mailing address::	US

Inventor Number::	2
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Family Name::	Dawood
City of Residence::	San Francisco
State of Residence::	CA
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Street of mailing address::	444 Castro St., Suite 600
City of mailing address::	Mountain View
State of mailing address::	CA
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County of mailing address:	US

Inventor Number::	3
Given Name::	Ravi
Family Name::	Gopalakrishnan
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State of Residence::	CA
Country of Residence::	US
Street of mailing address::	444 Castro St., Suite 600
City of mailing address::	Mountain View
State of mailing address::	CA
Postal or Zip Code of mailing address::	94041
County of mailing address:	US

Representative Information

Representative Customer Number:: 151512

Respectfully submitted,

Womble Bond Dickinson (US) LLP

Date: February 20, 2020

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

1841 Page Mill Road
Suite 200
Palo Alto, CA 94304
(408) 341-3091

DECLARATION (37 CFR 1.63) AND ASSIGNMENT FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DISCORDANCE MONITORING

This declaration and assignment is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/154,849 filed on May 13, 2016 .

DECLARATION

As a below named inventor, I hereby declare that:

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

ASSIGNMENT

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the undersigned, hereby sell, assign, and transfer to AliveCor, Inc.

a corporation of Delaware,

(Type of Assignee: e.g., corporation, company, partnership, university, etc.),

having a principal place of business at 444 Castro St., Ste 600, Mountain View, CA 94041,

("Assignee"), and its successors, assigns, and legal representatives, the entire right, title, and interest for the United States and all foreign countries, in and to any and all inventions or improvements that are disclosed in the above identified application and in and to said application (provisional or non-provisional) and all provisional applications, non-provisional applications, utility applications, design applications, divisional applications, continuation applications, continued prosecution applications, continuation-in-part applications, substitute applications, renewal applications, reissue applications, reexaminations, extensions, and all other patent applications that have been or shall be filed in the United States

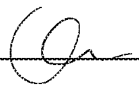
and all foreign countries on any of said inventions or improvements; and in and to all original patents, reissued patents, reexamination certificates, and extensions, that have been or shall be issued in the United States and all foreign countries on said inventions or improvements; and in and to all rights of priority resulting from the filing of said application;

agree that said Assignee may apply for and receive a patent or patents for said inventions or improvements in its own name; and that, when requested, without charge to, but at the expense of, said Assignee, its successors, assigns, and legal representatives, to carry out in good faith the intent and purpose of this Assignment, the undersigned will execute all provisional applications, non-provisional applications, utility applications, design applications, divisional applications, continuation applications, continued prosecution applications, continuation-in-part applications, substitute applications, renewal applications, reissue applications, reexaminations, extensions, and all other patent applications on any and all said inventions or improvements; execute all rightful oaths, assignments, powers of attorney, and other papers; communicate to said Assignee, its successors, assigns, and representatives all facts known to the undersigned relating to said inventions or improvements and the history thereof; and generally assist said Assignee, its successors, assigns, or representatives in securing and maintaining proper patent protection for said inventions or improvements and for vesting title to said inventions or improvements, and all applications for patents and all patents on said inventions or improvements, in said Assignee, its successors, assigns, and legal representatives; and

covenant with said Assignee, its successors, assigns, and legal representatives that no assignment, grant, mortgage, license, or other agreement affecting the rights and property herein conveyed has been made to others by the undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

LEGAL NAME OF INVENTOR

Inventor: Omar Dawood Date: Dec 2, 2019

Signature: 

LEGAL NAME OF INVENTOR

Inventor: Ravi Gopalakrishnan Date: _____

Signature: _____

DECLARATION (37 CFR 1.63) AND ASSIGNMENT FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DISCORDANCE MONITORING

This declaration and assignment is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/154,849 filed on May 13, 2016 .

DECLARATION

As a below named inventor, I hereby declare that:

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

ASSIGNMENT

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the undersigned, hereby sell, assign, and transfer to AliveCor, Inc.

a corporation of Delaware ,

(Type of Assignee: e.g., corporation, company, partnership, university, etc.),

having a principal place of business at 444 Castro St., Ste 600, Mountain View, CA 94041,

("Assignee"), and its successors, assigns, and legal representatives, the entire right, title, and interest for the United States and all foreign countries, in and to any and all inventions or improvements that are disclosed in the above identified application and in and to said application (provisional or non-provisional) and all provisional applications, non-provisional applications, utility applications, design applications, divisional applications, continuation applications, continued prosecution applications, continuation-in-part applications, substitute applications, renewal applications, reissue applications, reexaminations, extensions, and all other patent applications that have been or shall be filed in the United States

and all foreign countries on any of said inventions or improvements; and in and to all original patents, reissued patents, reexamination certificates, and extensions, that have been or shall be issued in the United States and all foreign countries on said inventions or improvements; and in and to all rights of priority resulting from the filing of said application;

agree that said Assignee may apply for and receive a patent or patents for said inventions or improvements in its own name; and that, when requested, without charge to, but at the expense of, said Assignee, its successors, assigns, and legal representatives, to carry out in good faith the intent and purpose of this Assignment, the undersigned will execute all provisional applications, non-provisional applications, utility applications, design applications, divisional applications, continuation applications, continued prosecution applications, continuation-in-part applications, substitute applications, renewal applications, reissue applications, reexaminations, extensions, and all other patent applications on any and all said inventions or improvements; execute all rightful oaths, assignments, powers of attorney, and other papers; communicate to said Assignee, its successors, assigns, and representatives all facts known to the undersigned relating to said inventions or improvements and the history thereof; and generally assist said Assignee, its successors, assigns, or representatives in securing and maintaining proper patent protection for said inventions or improvements and for vesting title to said inventions or improvements, and all applications for patents and all patents on said inventions or improvements, in said Assignee, its successors, assigns, and legal representatives; and

covenant with said Assignee, its successors, assigns, and legal representatives that no assignment, grant, mortgage, license, or other agreement affecting the rights and property herein conveyed has been made to others by the undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

LEGAL NAME OF INVENTOR

Inventor: Omar Dawood Date: _____

Signature: _____

LEGAL NAME OF INVENTOR

Inventor: Ravi Gopalakrishnan Date: 11/18/2019

Signature: _____

Doc Code: R48.REQ
Document Description: Request under Rule 48 correcting inventorship

PTO/AIA/40 (04-15)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

Application Number	16/158,112
Filing Date	2018-10-11
First Named Inventor	David E. Albert
Art Unit	3792
Examiner Name	TEJANI, ANKIT D
Practitioner Docket Number	A102992 1200US.C2

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant hereby **requests that the inventorship be corrected or changed, or that the name of the inventor or a joint inventor, or the order of the names of joint inventors, be changed,** in the above-identified application. **Note:** 37 CFR 1.48 applies to any request to correct inventorship filed on or after September 16, 2012, regardless of the application filing date. **Do not submit this form after payment of the issue fee or if the application has been patented.** See 37 CFR 1.324 for correction of inventorship in a patent.

Please check the applicable box(es) below.

For a nonprovisional application:

☒ 1. This request is to correct or change the inventorship in a **nonprovisional** application **(under 37 CFR 1.48(a))** and includes:

☒ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) with the corrected or updated information shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the Manual of Patent Examining Procedure (MPEP) section 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☒ The processing fee set forth in 37 CFR 1.17(i). $ 140

☒ An inventor is being added. An inventor's oath or declaration by any actual inventor who has not yet executed an oath or declaration is required (see 37 CFR 1.48(b)). See MPEP 602.01(a) for information about an inventor's oath or declaration for an application filed on/after September 16, 2012 (*e.g.*, form **PTO/AIA/01**). For information about an inventor's oath or declaration for an application filed before September 16, 2012 (*e.g.*, form **PTO/SB/01**), see MPEP 602.01(b).

☒ This request is being filed after the first Office action on the merits has been given or mailed (see 37 CFR 1.48(c) and 1.17(d)). Check one of the following:

☐ This request to correct or change the inventorship is due solely to the cancellation of claims in the application.

OR

☒ The fee set forth in 37 CFR 1.17(d) is due (in addition to the fee set forth in 37 CFR 1.17(i)). $ 600

PTO/AIA/40 (04-15)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
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REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

☐ 2. This request is to correct or update the name of the inventor or a joint inventor, or the order of names of joint inventors, in a **nonprovisional** application (**under 37 CFR 1.48(f)**) and includes:

☐ An application data sheet in accordance with 37 CFR 1.76(c) identifying the complete inventive entity, including the corrected or updated name of the inventor, or the new order of names shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the MPEP 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☐ The processing fee set forth in 37 CFR 1.17(i). $ _____

For a provisional application:

☐ This request is to change or correct the inventorship, or correct or update the name of the inventor or a joint inventor, in a **provisional** application (**under 37 CFR 1.48(d)**) and includes:

☐ **Attached hereto** is a request, signed by a party set forth in 37 CFR 1.33(b), that identifies each inventor by his or her legal name, in the preferred order.

☐ The processing fee set forth in 37 CFR 1.17(q). $ _____

Fee Payment Information:

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 09-0528.

☒ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ Applicant*

☒ attorney or agent of record
Registration number 74,758

☐ attorney or agent acting under 37 CFR 1.34
Registration number _____

Signature /Bill Jacobs/

Typed or printed name William D. Jacobs, Jr.

Date February 20, 2020

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. *Juristic entities must be represented by a patent practitioner (See 37 CFR 1.31, applicable to any paper filed on or after September 16, 2012 that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below**.

☒ ** Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: ALIVECOR, INC.

Application No./Patent No.: 16/158,112 Filed/Issue Date: October 11, 2018

Titled: DISCORDANCE MONITORING

ALIVECOR, INC., a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 050768, Frame 0120, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Bill Jacobs/	February 20, 2020
Signature	Date
William D. Jacobs, Jr.	74758
Printed or Typed Name	Title or Registration Number

[Page 2 of 2]

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/80 (07-17)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 151512

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 151512

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: AliveCor, Inc.
444 Castro Street, Suite 600
Mountain View, CA 94041

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature Brian Clarke	Date 10/18/2017
Name Brian Clarke	Telephone
Title General Counsel	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
CORRECTION OF INVENTORSHIP ON MERITS	1819	1	600	600
STATUTORY OR TERMINAL DISCLAIMER	1814	2	160	320
		Total in USD ($)		**1060**

Electronic Acknowledgement Receipt	
EFS ID:	38640476
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	20-FEB-2020
Filing Date:	11-OCT-2018
Time Stamp:	17:33:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1060
RAM confirmation Number	E20202JH35481325
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		A102992_1200USC2_Amendment.pdf	119483 17a5087f9c9a2f95ca08e19ed4ed65ef2f1f034f	yes	7
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Response After Final Action		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	7	
Warnings:					
Information:					
2	After Final Consideration Program Request	A102992_1200USC2_AFCP.pdf	240980 943777dfbdf68741ece8569e1a5692eeef201e9b	no	2
Warnings:					
Information:					
3	Terminal Disclaimer Filed	A102992_1200USC2_TD_250.pdf	156561 dab71b89d60d194c374db035b6a4721ba1d26c1a	no	2
Warnings:					
Information:					
4	Terminal Disclaimer Filed	A102992_1200USC2_TD_363.pdf	156557 e63506832bafe9b7bae24e59658d0abfd020c14a	no	2
Warnings:					
Information:					
5	Application Data Sheet	A102992_1200USC2_Corr_ADS.pdf	65763 129384c86ca830ad3652be6c8d29a22a4c1d94f1	no	3

Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
6	Oath or Declaration filed	A102992_1200US1_Dec_Dawood.pdf	99303 905435fafd4773eaed6e5e719c56358b90ca1601	no	2
Warnings:					
Information:					
7	Oath or Declaration filed	A102992_1200US1_Dec_Ravi.pdf	172152 9a09da7225162e51e8f9fa34b40982fc629706c7	no	2
Warnings:					
Information:					
8	Request under Rule 48 correcting inventorship	A102992_1200USC2_Petition_Correct_Inv_.pdf	177549 d0f9106dc794e20feefbefedcf54470116001 2c8	no	3
Warnings:					
Information:					
9	Assignee showing of ownership per 37 CFR 3.73	A102992_1200USC2_373_Statement.pdf	129762 c32a32835c28091f9a1530ff109a0ebc46eaa681	no	3
Warnings:					
Information:					
10	Power of Attorney	Alive_POA.pdf	162218 7d6406dca0fe26f38cd96de77969e2ae320349b3	no	2
Warnings:					
Information:					
11	Fee Worksheet (SB06)	fee-info.pdf	33846 490095702cb56382bbbdb520eca652c0e1b227b2	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1514174		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/158,112	Filing Date 10/11/2018	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)			
FOR	NUMBER FILED	NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $460 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/20/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 23	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JOHN W EPPS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

151512 7590 02/18/2020

WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
TEJANI, ANKIT D	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
02/18/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketing@wbd-us.com

Office Action Summary	Application No. 16/158,112	Applicant(s) Albert, David E.	
	Examiner ANKIT D TEJANI	Art Unit 3792	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 03 February 2020.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-6,10-15 and 19-29 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-6,10-15 and 19-29 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 06 February 2020.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Status of Claims

2. Claims 1-6, 10-15, and 19-29 are pending and under consideration for patentability; claims 3, 10, 22 have been amended.

Information Disclosure Statement

3. The Information Disclosure Statement submitted on 06 February 2020 has been acknowledged and considered by the Examiner.

Response to Arguments

4. Applicant's arguments, see pp. 6-12, filed 03 February 2020, with respect to the rejections of claims 1-6, 10-15, and 19-29 under 35 U.S.C. 103 have been fully considered and are persuasive. Therefore, the corresponding rejections have been withdrawn.

Regarding the nonstatutory double patenting rejections, as the scope of the claims has not substantially changed and the Applicant has not otherwise addressed or remedied the rejections, the nonstatutory double patenting rejections have been maintained in this Office Action. The Examiner notes that, during the prosecution of the instant claims, U.S. Application No. 15/656,745 has been allowed to issue as U.S. Patent No. 10,537,250. Therefore, the provisional nonstatutory double patenting rejection over copending Application No. 15/656,745 has been updated to a double patenting rejection over U.S. Patent No. 10,537,250.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

6. Claims 1-6, 10-15, 19-21, and 25-27 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims recite sensing heart rate and activity levels of a user,

determining a discordance between the heart rate and activity levels, and collecting an electrocardiogram signal in response to determining that a discordance is present.

7. Claims 22-24, 28, and 29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363 in view of Yuen (US 2015/0122018 A1) and Katra et al. (US 2014/0276154 A1).

Regarding claims 22 and 28, U.S. Patent No. 9,839,363 does not recite displaying an ECG rhythm strip from the electric signals on the smartwatch or wristlet. However, Yuen describes the use of a smartwatch or wristlet (figure 7), and Katra describes displaying an ECG rhythm strip from the electric signals on a handheld computing device ([0078]). As Yuen, Katra, and U.S. Patent No. 9,839,363 are all directed towards monitoring biometric data and are in a similar field of endeavor, it would have been obvious to a person having ordinary skill in the art at the time the invention was filed to use the smartwatch described by Yuen and displaying an ECG rhythm strip as described by Katra when using the method described by U.S. Patent No. 9,839,363, as doing so advantageously allows the wearer to visually track and monitor his/her cardiac status while implementing any corrective actions in case of an adverse event. The Examiner respectfully submits that, as a smartwatch also contains a display, the method resulting from an obvious combination of Yuen, Katra, and U.S. Patent No. 9,839,363 would display the ECG rhythm strip on the smartwatch or wristlet.

Regarding claim 23, Yuen further describes wherein the PPG sensor is located on the back of the smartwatch or wristlet (figure 2B).

Regarding claims 24 and 29, Yuen further describes wherein the first electrode is located on the smartwatch or wristlet in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet ([0183]), and the second electrode is located on the smartwatch or wristlet in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side ([0182] - [0183]; figure 7).

8. Claims 1, 5, 10, and 14 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 10,537,250. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims recite sensing heart rate and activity levels of a user, determining a discordance between the heart rate and activity levels, and collecting an electrocardiogram signal in response to determining that a discordance is present.

9. Claims 2-4, 6, 11-13, 15, and 19-29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 10,537,250 in view of Yuen and Katra.

Regarding claims 2 and 11, U.S. Patent No. 10,537,250 does not recite wherein the heart rate parameter comprises an indication of a heart rate variability and wherein the arrhythmia is atrial fibrillation. Yuen and Katra also disclose methods for monitoring biometric parameters, including wherein the heart rate parameter comprises an indication of a heart rate variability (Yuen: [0130]) and the arrhythmia is atrial fibrillation (Katra: [0025]). As Yuen, Katra, and U.S. Patent No. 10,537,250 are all directed

towards monitoring biometric data and are in a similar field of endeavor, it would have been obvious to a person having ordinary skill in the art at the time the invention was filed to measure heart rate variability as described by Yuen and monitor for atrial fibrillation as described by Katra, as doing so advantageously allows the resulting method to more comprehensively screen for potential adverse cardiac events.

Regarding claims 3 and 12, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 4 and 13, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate value ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 6 and 15, Katra further describes wherein the arrhythmia is atrial fibrillation or ventricular tachycardia ([0025]).

Regarding claims 19 and 25, Yuen further describes wherein the heartrate parameter is a PPG signal ([0134] - [0135]; figures 12A-12B).

Regarding claims 20 and 26, Yuen further describes wherein the heart rate parameter is a heart rate variability value derived from the PPG signal ([0130], [0134] - [0135]).

Regarding claims 21 and 27, Yuen further describes wherein the heart rate parameter is a heartrate derived from the PPG signal ([0130], [0134] - [0135]).

Regarding claims 22 and 28, Katra describes displaying an ECG rhythm strip from the electric signals on a handheld computing device ([0078]). The Examiner respectfully submits that, as a smartwatch also contains a display, the method resulting

from an obvious combination of Yuen and Katra would display the ECG rhythm strip on the smartwatch or wristlet.

Regarding claim 23, Yuen further describes wherein the PPG sensor is located on the back of the smartwatch or wristlet (figure 2B).

Regarding claims 24 and 29, Yuen further describes wherein the first electrode is located on the smartwatch or wristlet in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet ([0183]), and the second electrode is located on the smartwatch or wristlet in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side ([0182] - [0183]; figure 7).

Statement on Communication via Internet

10. Communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant in place, the USPTO will not respond via Internet e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. Where a written authorization is given by the applicant, communications via Internet e-mail, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used. USPTO employees are NOT permitted to initiate communications with applicants via Internet e-mail unless there is a written authorization of record in the patent application by the applicant. The following is a sample authorization form which may be used by applicant:

> "Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application by video conferencing,

> instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file."

Please refer to MPEP 502.03 for guidance on Communications via Internet.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ankit D. Tejani whose, telephone number is 571-272-5140. The Examiner may normally be reached on Monday through Friday, 8:30AM through 5:00PM EST. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, Applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice. If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno, can be reached by

telephone at 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (in USA or Canada) or 571-272-1000.

/Ankit D Tejani/
Primary Examiner, Art Unit 3792

Notice of References Cited	Application/Control No. 16/158,112	Applicant(s)/Patent Under Reexamination Albert, David E.	
	Examiner ANKIT D TEJANI	Art Unit 3792	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-10537250-B2	01-2020	Albert; David E.	A61B5/681	1/1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert, David E.
	Examiner	Art Unit
	ANKIT D TEJANI	3792

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	01/15/2019	09/25/2019	02/11/2020						
	1	÷	✓	✓						
	2	÷	✓	✓						
	3	÷	✓	✓						
	4	÷	✓	✓						
	5	÷	✓	✓						
	6	÷	✓	✓						
	7	÷	-	-						
	8	÷	-	-						
	9	-	-	-						
	10	÷	✓	✓						
	11	÷	✓	✓						
	12	÷	✓	✓						
	13	÷	✓	✓						
	14	÷	✓	✓						
	15	÷	✓	✓						
	16	÷	-	-						
	17	÷	-	-						
	18	-	-	-						
	19		✓	✓						
	20		✓	✓						
	21		✓	✓						
	22		✓	✓						
	23		✓	✓						
	24		✓	✓						
	25		✓	✓						
	26		✓	✓						
	27		✓	✓						
	28		✓	✓						
	29		✓	✓						

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert, David E.
	Examiner	Art Unit
	ANKIT D TEJANI	3792

CPC - Searched*		
Symbol	Date	Examiner
A61B5/0205,02405,02438,04085,046,0464,1118,681,7267 (keyword text search)	02/11/2020	ADT

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
PALM (inventor search)	02/11/2020	ADT
EAST (search history attached)	02/11/2020	ADT

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S18	9	("20120109675" | "20120289790" | "20140163393" | "20150057512" | "20150305684" | "7846106").PN. ("20140125619" "20120197148" "20070213624").pn.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:01
S19	25906	(A61B5/0205,02405,02438,04085,046,0464,1118,681,7267).CPC.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S20	2	("20140276154" "20130281816").pn.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S21	658	(albert with david).in.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S22	58	(albert with david).in. AND alivecor	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S23	168	alivecor	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S24	274	(smartwatch watch wristlet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S25	4	(smartwatch watch wristlet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND discord$4 AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S26	283	(smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S27	274	(smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND (correlat$3 discord$4 correspond$4) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S28	25906	(A61B5/0205,02405,02438,04085,046,0464,1118,681,7267).CPC.	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S29	154	S19 AND (smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND (correlat$3 discord$4 correspond$4) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S30	2	("20140276154" "20130281816").pn.	US-PGPUB;	OR	ON	2020/02/10 15:02

			USPAT; USOCR			
S31	159	S19 AND (smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S32	4599	(heart with rate) same (movement displacement activity motion) same (discord$5 correlat$4)	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S33	1787	S19 AND S32	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S34	744	S33 AND ($5arrhythmia $5cardia) AND (electrocardiogra$3 ecg ekg)	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02
S35	362	S33 AND ($5arrhythmia $5cardia) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2020/02/10 15:02

EAST Search History (Interference)

<This search history is empty>

02/11/2020 11:03:58
C:\Users\atejani\Documents\EAST\Workspaces\16158112.wsp

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16158112
Filing Date	2018-10-11
First Named Inventor	David E. Albert
Art Unit	3792
Examiner Name	Tejani, Ankit D.
Attorney Docket Number	A102992 1200US.C2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20140125619	A1	2014-05-08	Panther et al.	
	2	20120197148	A1	2012-08-02	LEVITAN et al.	
	3	20070213624	A1	2007-09-13	Reisfeld et al.	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ADT/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16158112
	Filing Date	2018-10-11
	First Named Inventor	David E. Albert
	Art Unit	3792
	Examiner Name	Tejani, Ankit D.
	Attorney Docket Number	A102992 1200US.C2

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/ANKIT D TEJANI/	Date Considered	02/11/2020

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ADT/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16158112
	Filing Date	2018-10-11
	First Named Inventor	David E. Albert
	Art Unit	3792
	Examiner Name	Tejani, Ankit D.
	Attorney Docket Number	A102992 1200US.C2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Bill Jacobs/	Date (YYYY-MM-DD)	2020-02-06
Name/Print	William D. Jacobs, Jr.	Registration Number	74758

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ADT/

Privacy Act Statement

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	16158112
	Filing Date	2018-10-11
	First Named Inventor	David E. Albert
	Art Unit	3792
	Examiner Name	Tejani, Ankit D.
	Attorney Docket Number	A102992 1200US.C2

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	1	20140125619	A1	2014-05-08	Panther et al.	
	2	20120197148	A1	2012-08-02	LEVITAN et al.	
	3	20070213624	A1	2007-09-13	Reisfeld et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16158112
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	First Named Inventor	David E. Albert
	Art Unit	3792
	Examiner Name	Tejani, Ankit D.
	Attorney Docket Number	A102992 1200US.C2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Bill Jacobs/	Date (YYYY-MM-DD)	2020-02-06
Name/Print	William D. Jacobs, Jr.	Registration Number	74758

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2
Filed as Large Entity	
Filing Fees for **Utility under 35 USC 111(a)**	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	38509992
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	06-FEB-2020
Filing Date:	11-OCT-2018
Time Stamp:	11:55:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	E202026B58267797
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	A102992_1200USC2_IDS.pdf	1034335 d262e6ec0b43182236b55e7de397085899f646ed	no	4
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30478 d771ea06e66d11af6da7fa54e6cf8c3073487341	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1064813		

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: David E. Albert Serial No. 16/158,112 Filed: October 11, 2018 For: DISCORDANCE MONITORING	EXAMINER: TEJANI, ANKIT D. ART UNIT: 3792 CONF NO.: 7079

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT AND RESPONSE TO OFFICE ACTION

Sir:

In response to the Office Action mailed on November 2, 2019, Applicant respectfully requests the Examiner to consider the following amendments and remarks.

Amendments to the claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

IN THE CLAIMS

1. (Previously presented) A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor on a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor on the smartwatch;

determining a discordance is present between the activity level value and the heart rate parameter;

based on the presence of the discordance, indicating to the user, using the smartwatch, a possibility of an arrhythmia being present; and

receiving electric signals of the user from an electrocardiogram sensor ("ECG") on the smartwatch to confirm a presence of the arrhythmia, wherein the ECG sensor comprises a first electrode and a second electrode.

2. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

3. (Currently amended) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

4. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

5. (Previously presented) The method according to claim 1, wherein indicating to the user further comprises: instructing the user to record an ECG using the smartwatch.

6. (Previously presented) The method according to claim 1, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Currently amended) A smartwatch, comprising:

a processor;

a first sensor configured to sense an activity level value of a user, wherein the first sensor is coupled to the processor;

a photoplethysmogram ("PPG") sensor configured to sense a heart rate parameter of the user when the activity level value is resting, wherein the PPG sensor is coupled to the processor;

an electrocardiogram ("ECG") sensor configured to sense electrical signals of a heart, wherein the ECG sensor comprises a first electrode and a second electrode, and wherein the ECG sensor is coupled to the processor; and

a non-transitory computer readable storage medium encoded with a computer program including instructions executable by the processor to cause the processor to:

determine if a discordance is present between the activity level value of the user and the heart rate parameter of the user;

based on the presence of the discordance, indicate to the user a possibility of an arrhythmia being present;

receive electric signals of the user from the ECG sensor to confirm the presence of the arrhythmia.

11. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

12. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

13. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate value, and wherein the arrhythmia is atrial fibrillation.

14. (Previously presented) The smartwatch or wristlet according to claim 10, wherein indicating to the user further comprises: instructing the user to record an ECG using the ECG sensor.

15. (Previously presented) The smartwatch or wristlet according to claim 10, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraentricular tachycardia, and ventricular tachycardia.

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Previously presented) The smartwatch according to claim 10, wherein the heartrate parameter is a PPG signal.

20. (Previously presented) The smartwatch according to claim 19, wherein the heartrate parameter is a heartrate variability ("HRV") value, wherein the HRV value is derived from the PPG signal.

21. (Previously presented) The smartwatch according to claim 19, wherein the heartrate parameter is a heartrate, wherein the heartrate is derived from the PPG signal.

22. (Currently amended) The smartwatch according to claim[[s]] 10, the processor~~processing device~~ further to: display an ECG rhythm strip from the electric signals.

23. (Previously presented) The smartwatch according to claim 10, wherein the PPG sensor is located on the back of the smartwatch.

24. (Previously presented) The smartwatch according to claim 10, wherein the first electrode is located on the smartwatch where the first electrode contacts a first side of the user's body while the user wears the smartwatch, and the second electrode is located on the smartwatch where the user must actively contact the second electrode with a second side of the user's body opposite from the first side.

25. (Previously presented) The method according to claim 1, wherein the heartrate parameter is a PPG signal.

26. (Previously presented) The smartwatch according to claim 25, wherein the heartrate parameter is a heartrate variability ("HRV") value, wherein the HRV value is derived from the PPG signal.

27. (Previously presented) The smartwatch according to claim 25,wherein the heartrate parameter is a heartrate, wherein the heartrate is derived from the PPG signal.

28. (Previously presented) The smartwatch according to claims 1 further comprising:
displaying an ECG rhythm strip from the electric signals on the smartwatch.

29. (Previously presented) The smartwatch according to claim 1, wherein the first electrode is located on the smartwatch in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch, and the second electrode is located on the smartwatch in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side.

REMARKS

Applicant respectfully requests reconsideration of this application in view of the amendments and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in substantially the same order in which the corresponding issues were raised in the Office action.

Status of the Claims

Claims 1-6, 10-15 and 19-29 are pending. Claims 3, 10, and 22 are currently amended. No claims are added in the current amendment. No new matter has been added.

Summary of the Interview

Applicant thanks the examiner for conducting the interview on November 25, 2019 with the Applicant's undersigned representative. During the interview, no specific agreement was reached.

Summary of the Office action

Claims 3, 10, and 22 are objected to because of alleged informalities.

Claims 1-6, 10-15, 19-21, and 25-27 are rejected on the ground of nonstatutory double patenting as allegedly being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363.

Claims 22-24, 28 and 29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363 in view of Yuen and Katra.

Claims 1, 5, 10, and 14 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of copending Application No. 15/656,745.

Claims 2-4, 6, 11-13, 15, and 19-29 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of copending Application No. 15/656,745 in view of Yuen and Katra.

Claims 1-6, 10-15, and 19-29 are rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Yuen (US Publication No. 2015/0122018 A1, hereinafter "Yuen") in view of Katra et al. (US Publication No. 2014/0276154 A1, hereinafter "Katra").

Response to Informalities Rejections

CLAIMS 3, 10 AND 22

Claims 3, 10, and 22 are objected to because of alleged informalities. Applicant notes that claims 3, 10, and 22 have been amended by the current response. As such, Applicant respectfully requests that the objections be withdrawn.

Response to Double Patenting Rejections

Claims 1-6, 10-15, 19-21, and 25-27 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363.

Claims 22-24, 28 and 29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363 in view of Yuen and Katra.

Claims 1, 5, 10, and 14 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of copending Application No. 15/656,745.

Claims 2-4, 6, 11-13, 15, and 19-29 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of copending Application No. 15/656,745 in view of Yuen and Katra.

Applicant notes that there is an outstanding rejection in this application. Therefore, the scope of the claims may change in course of further prosecution, which may lead to withdrawal the obviousness-type double patenting rejections in regards to at least some of the claims. Accordingly, the Examiner is respectfully requested to indicate whether the obviousness-type double patenting rejection is maintained for each of the currently rejected claims at the time when allowable subject matter is identified.

Response to Rejection under 35 U.S.C. § 103

CLAIMS 1-6, 10-15 AND 19-29

Claims 1-6, 10-15, and 19-29 are rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Yuen in view of Katra. Applicant respectfully disagrees.

Claim 1 recites:

A method of cardiac monitoring, comprising:
sensing an activity level of a user with a first sensor on a smartwatch worn by the user;
when the activity level is resting, sensing a heart rate parameter of the user with a second sensor on the smartwatch;
determining a discordance is present between the activity level value and the heart rate parameter;
based on the presence of the discordance, indicating to the user, using the smartwatch, a possibility of an arrhythmia being present; and
receiving electric signals of the user from an electrocardiogram sensor ("ECG") on the smartwatch to confirm a presence of the arrhythmia, wherein the ECG sensor comprises a first electrode and a second electrode.
(Emphasis added).

As discussed during the interview, Applicant submits that at least the above features are not inherent in the cited art. The Office action appears to imply that the above emphasized "determining a discordance feature" is taught or suggested by Yuen. Office action, pg. 4. Applicant respectfully disagrees. The cited portion of Yuen (paragraph [0237]) describes:

> Some embodiments of the biometric monitoring devices of the present disclosure may use data from two or more sensors to calculate the corresponding physiological or environmental data as seen in the table below (for example, data from two or more sensors may be used in combination to determine metrics such as those listed below). The biometric monitoring device may include, but is not limited to, the number, types, or combinations of sensors specified below. Additionally, such biometric monitoring devices may derive the included data from the corresponding sensor combinations, but are not limited to the number or types of data that may be calculated from the corresponding sensor combinations.
>
> Data derived from signal Sensor Integrations processing of multiple sensors Skin Temp and Ambient Temp Heat Flux Heart Rate and Motion Elevation gain Motion detector and other user's Users in the proximity motion detector (linked by wireless communication path) Motion, any heart rate sensor, Sit/Standing detection galvanic skin response Any heart rate, heart rate variability Sleep Phase detection sensor, respiration, motion Sleep Apnea detection Any heart rate sensor and/or Resting Heart rate wetness sensor, and/or motion Active Heart Rate detector Heart rate while asleep Heart rate while sedentary Any heart rate detector Early detection of heart problems: Cardiac Arrhythmia Cardiac Arrest Multiple heart rate detectors Pulse transit time Audio and/or strain gauge Typing detection GPS and photoplethysmography Location-stress correlation: (PPG) determination of stressful regions determination of low stress regions Activity-specific heart rate resting heart rate active heart rate Automatic activity classification and activity heart rate determination Heart rate, galvanic skin response, User fatigue, for example while accelerometer and respiration exercising. (Yuen, paragraph [0237]).

As shown, at best Yuen merely describes the possibility of using data from two or more sensors in combination to determine a variety of metrics. Yuen does not however, describe any specifics with respect to how data from two sensors may be combined to determine any metrics in particular. Specifically, Yuen does not describe how activity data and hear rate data may be analyzed in combination to determine a discordance. In fact, Yuen does not describe the discordance concept at all.

Instead, the Office action appears to be relying on inherency to falsely allege that because a reference is capable of performing a recited limitation of the Applicant's claims based on some combination of features mentioned in the reference, that the reference teaches or suggests that recited limitation. Applicant respectfully disagrees.

Applicant submits that "the fact that a certain result or characteristic *may occur* or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art)." MPEP § 2112. As such, assuming arguendo that the cited art teaches the sensors and systems *capable of* determining discordance, the cited references still do not teach or suggest the discordance features recited by claim 1 at least because the Office action does not "provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)." MPEP § 2112.

Furthermore, assuming the sensors of Yuen are capable of performing discordance analysis, as recited by claim, Yuen is still not enabled to do so. Yuen does not describe any methods, systems, or algorithms that are capable to transform raw data received from an activity sensor and a heart rate sensor into a meaningful discordance metric. Such data could be combined in any number of possible combinations and analyzed in any number of ways to aid in the determination of health related issues, none

of which are contemplated by Yuen. As such, Applicant submits that Yuen also fails to be enabled with respect to any discordance features recited by claim 1.

Additionally, as discussed during the interview, the Office action acknowledges that Yuen does not teach or suggest "based on the presence of the discordance, indicating to the user, using the smartwatch, a possibility of an arrhythmia being present," as recited by claim 1. Office action, pg. 5. Instead, the Office action relies upon Katra to allegedly remedy the deficiency. Applicant respectfully disagrees.

At best, Katra describes a simpler method of using a heart rate threshold (Katra's "predetermined characteristic") to trigger further monitoring actions and therefore is not suggestive of using the more complex discordance data in order to determine the possibility of the presence of an arrhythmia. Examiner agreed that Katra's teachings are broad, and agreed to take a second look.

Specifically, Applicant submits that Katra merely describes using a heart rate threshold as an indicator of a heart-related issue. Katra does not describe indicating to a user *the possibility* of an arrhythmia being present and certainly does not teach or suggest doing so *in response to* determining the presence of an arrhythmia. At best, Katra describes determining if a heart rate has exceeded a particular value as an indication of a problem. Katra further does not describe taking an ECG to conform the possibility of an arrhythmia detected based on a discordance.

For at least the reasons discussed above, Applicant submits that the combination of Yuen and Katra do not teach or suggest the features of claim 1. Independent claim 10 recited similar, although not identical features as those

recited by claim 1. As such, Applicant respectfully requests that the rejections of claim 1, 10, as well as their respective dependent claims, be withdrawn.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. A notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 341-3091. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 09-0528.

Should the Examiner have any questions concerning this matter, please contact the undersigned.

Respectfully submitted,

WOMBLE BOND DICKINSON (US) LLP

Date: February 3, 2019

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

1841 Page Mill Road
Suite 200
Palo Alto, CA 94304
(408) 341-3091

Electronic Patent Application Fee Transmittal	
Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Sheryl Bernardo
Attorney Docket Number:	A102992 1200US.C2
Filed as Large Entity	
Filing Fees for **Utility under 35 USC 111(a)**	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt	
EFS ID:	38479385
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Sheryl Bernardo
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	03-FEB-2020
Filing Date:	11-OCT-2018
Time Stamp:	18:06:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$200
RAM confirmation Number	E202023I07169920
Deposit Account	090528
Authorized User	Sheryl Bernardo
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		A102992_1200USC2_RESPNFOA.pdf	159264 73766e8caf6397f9bf1329f527acf819aa60e1fe	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	12

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30786 6026c6a830f67114bb42b8bf9f7d0cd2fc73a2ed	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	190050		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/158,112	Filing Date 10/11/2018	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)			
FOR	NUMBER FILED	NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $460 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/03/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 23	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/DAWN BREWER/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

151512 7590 12/02/2019

WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
TEJANI, ANKIT D	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
12/02/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketing@wbd-us.com

Applicant-Initiated Interview Summary	**Application No.** 16/158,112	**Applicant(s)** Albert, David E.	
	Examiner ANKIT D TEJANI	**Art Unit** 3792	**AIA (FITF) Status** Yes

All participants (applicant, applicants representative, PTO personnel):

(1) ANKIT D. TEJANI. (3) _____.

(2) Bill Jacobs. (4) _____.

Date of Interview: 25 November 2019.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☑103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1.

Identification of prior art discussed: Yuen (US 2015/0122018 A1); Katra et al. (US 2014/0276154 A1).

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

See Continuation Sheet.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☑ Attachment

/ANKIT D TEJANI/ Primary Examiner, Art Unit 3792	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Attorney provided brief overview of claimed device, with particular focus on the steps of determining a discordance between heart rate and activity data and indicating a possibility of an arrhythmia being present based on the presence of the discordance. Attorney argued that, although the component sensors may be known in the prior art, configuring the specific sensors for the specific function as recited in the pending claims is not inherent in the prior art. Examiner respectfully maintained that, though not inherent, the prior art suggests correlating heart rate and activity data in order to help determine if an adverse medical condition is present. Examiner suggested that Attorney could add language to the claim limitations to further recite the configuration and function of the sensors, as the claims presently use the broad terminology of "determining a discordance" between the heart rate and activity data.

Regarding the Katra reference, Attorney argued that Katra's simpler method of using a heart rate threshold in order to trigger further monitoring actions is not suggestive of using the more complex discordance data in order to determine the presence of an arrhythmia. Examiner agreed that Katra's teachings are broad, and, based on how the independent claims may be amended, the Katra reference might not be relied upon in future rejections.

As a point of clarification, Attorney explained that the Applicant's system does not automatically collect ECG data directly in response to determining a discordance. There may be intermediary steps between determining a discordance and indicating that an arrhythmia may be present. Examiner appreciated the clarification and Attorney's consideration during the interview.

No agreement was reached on exact claim language.

Tejani, Ankit

From: Jacobs, Bill <Bill.Jacobs@wbd-us.com>
Sent: Monday, November 25, 2019 10:03
To: Tejani, Ankit
Subject: A102992 1200US.C2 Interview Agenda 11_22_19
Attachments: A102992 1200US.C2 Interview Agenda 11_22_19.DOC

Hi Examiner Tejani,

In anticipation of the upcoming interview, please see the attached topics for discussion.

Thank you,
Bill

Bill Jacobs
Associate
Womble Bond Dickinson (US) LLP

d: 408-341-3091
m: 650-704-5148
e: Bill.Jacobs@wbd-us.com

1841 Page Mill Road
Suite 200
Palo Alto, CA 94304

womblebonddickinson.com

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	)	
	)	Examiner: Tejani, Ankit D.
David E. Albert	)	
	)	Art Unit: 3792
Application No: 16/158,112	)	
	)	Atty. Docket No: A102992 1200US.C2
Filed: October 11, 2018	)	
	)	
For: DISCORDANCE MONITORING	)	

INTERVIEW AGENDA

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In connection with the upcoming interview on November 25, 2019, please consider the following remarks. Please note that the client is very keen on an expedited allowance in this case, and will consider any amendments suggested by the examiner to that effect.

Listing of Claims:

What is claimed is:

1. (Currently amended) A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor on a wristlet or a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor on the smartwatch or wristlet;

determining a discordance is present between the activity level value and the heart rate parameter;

based on the presence of the discordance, indicating to the user, using the smartwatch or wristlet, a possibility of an arrhythmia being present; and

receiving electric signals of the user from an electrocardiogram sensor ("ECG") on the smartwatch or wristlet to confirm a presence of the arrhythmia, wherein the ECG sensor comprises a first electrode and a second electrode.

Applicant would like to discuss the above features of claim 1 with respect to the cited references Yuen and Katra. Generally, the Applicant would like to clarify and distinguish the discordance feature over the cited art. More specifically, Applicant submits that at least the above features are not inherent in the cited art. Applicant submits that "the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art)." MPEP § 2112. As such, assuming arguendo that the cited art teaches the sensors and systems *capable of* determining discordance and performing an action based on that determination, the cited references still do not teach or suggest the discordance features recited by claim 1 at least because the Office action does not "provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)." MPEP § 2112.

Respectfully submitted,
WOMBLE BOND DICKINSON (US) LLP

Date: November 25, 2019

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

151512 7590 10/02/2019

WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
TEJANI, ANKIT D	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
10/02/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketing@wbd-us.com

Office Action Summary	**Application No.** 16/158,112	**Applicant(s)** Albert, David E.	
	Examiner ANKIT D TEJANI	**Art Unit** 3792	**AIA (FITF) Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 06 February 2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-6,10-15 and 19-29 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☐ Claim(s) _____ is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 11 October 2018 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 11 October 2018.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Election/Restrictions

2. In view of Applicant's Preliminary Amendment dated 06 February 2019, the Requirement for Restriction/Election dated 08 February 2019 has been withdrawn. The Examiner thanks Applicant for directing his attention to the Preliminary Amendment and claims contained therein, and the Examiner regrets any delay caused in prosecution of the claims due to the Requirement for Restriction/Election. Claims 1-6, 10-15, and 19-29, as filed on 06 February 2019, will be examined for patentability.

Status of Claims

3. Claims 1-6, 10-15, and 19-29, as filed in the Preliminary Amendment dated 06 February 2019, are pending and under consideration for patentability.

Information Disclosure Statement

4. The Information Disclosure Statement submitted on 11 October 2018 has been acknowledged and considered by the Examiner.

Claim Objections

5. Claims 3, 10, and 22 are objected to because of the following informalities.

Claims 3, 10, and 22 contain minor typographical or grammatical errors.

- Claim 3, line 2: Applicant is advised to change "indication a heart rate variability" to "indication of a heart rate variability"
- Claim 10, line 5: Applicant is advised to change "photopletysmogram" to "photoplethysmogram"
- Claim 22, line 1: Applicant is advised to change "claims 10" to "claim 10"
- Claim 22, line 1: Applicant is advised to change "processing device further to" to "processor further configured to"

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6, 10-15, and 19-29 are rejected under 35 U.S.C. 103 as being unpatentable over Yuen (US 2015/0122018 A1) in view of Katra et al. (US 2014/0276154 A1).

Regarding claims 1 and 10, Yuen describes a method of cardiac monitoring (table 1, the device may be used to track the user's cardiac health), comprising

- sensing an activity level of a user with a first sensor on a wristlet or a smartwatch worn by the user ([0134] - [0135]; figures 12A-12B)
- when the activity level is resting ([0151] - [0152]), sensing a heart rate parameter of the user with a second sensor on the smartwatch or wristlet ([0134] - [0135]; figures 12A-12B)
- determining a discordance is present between the activity level value and the heart rate parameter ([0237], table 3; correlating data from multiple sensors in order to determine biometrics)
- receiving electric signals of the user from an electrocardiogram sensor on the smartwatch or wristlet (table 1) to confirm a presence of an arrhythmia (table 3), wherein the ECG sensor comprises a first electrode and a second electrode ([0207] describes GSR electrodes, which, though different from ECG electrodes, suggest the use of electrodes for measuring ECGs in accordance with table 1)

Regarding claim 10 in particular, Yuen describes a processor on the smartwatch or wristlet ([0129]), a photoplethysmogram sensor configured to sense a heart rate parameter of the user ([0134] - [0135]; figures 12A-12B), and a non-transitory computer readable storage medium ([0567]).

Regarding claims 1 and 10, Yuen does not explicitly disclose wherein, based on the presence of the discordance, indicating to the user, using the smartwatch or wristlet, a possibility of an arrhythmia being present. As a result, although Yuen's method collects ECG data in order to confirm the presence of an arrhythmia, it does not automatically collect the ECG data directly in response to determining a discordance. However, Katra also describes a method of cardiac monitoring ([0025]), including wherein the device monitors physiological parameters and records ECG signals based on predetermined characteristics of the physiologic parameter ([0077]). Katra further describes wherein the predetermined characteristics may be thresholds indicative of cardiac arrhythmias ([0035] and [0061]). A method resulting from an obvious combination of Yuen and Katra would, therefore, monitor physiological parameters corresponding to a discordance between the activity level and the heart rate level, and, in response to determining a discordance (i.e., Katra's "predetermined characteristic"), record an ECG in order to determine whether an arrhythmia is present (in accordance with Yuen's table 3 and Katra's [0035] and [0061]). As Katra is also directed at monitoring a user's biometric data and is in a similar field of endeavor, the Examiner respectfully submits that it would have been obvious to a person having ordinary skill in the art at the time the invention was filed to incorporate an arrhythmia confirmation step similar to that described by Katra when using a method similar to that described by Yuen, as doing so advantageously allows the resulting method to accurately screen for arrhythmias related to discordances between biometric data while minimizing false positive arrhythmia results (Katra: [0062]).

Regarding claims 2 and 11, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate variability ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 3 and 12, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 4 and 13, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate value ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 5 and 14, Katra further describes instructing the user to record an ECG electrocardiogram ([0077]), and Yuen further describes using the smartwatch or wristlet (figure 7).

Regarding claims 6 and 15, Katra further describes wherein the arrhythmia is atrial fibrillation or ventricular tachycardia ([0025]).

Regarding claims 19 and 25, Yuen further describes wherein the heartrate parameter is a PPG signal ([0134] - [0135]; figures 12A-12B).

Regarding claims 20 and 26, Yuen further describes wherein the heart rate parameter is a heart rate variability value derived from the PPG signal ([0130], [0134] - [0135]).

Regarding claims 21 and 27, Yuen further describes wherein the heart rate parameter is a heartrate derived from the PPG signal ([0130], [0134] - [0135]).

Regarding claims 22 and 28, Katra describes displaying an ECG rhythm strip from the electric signals on a handheld computing device ([0078]). The Examiner

respectfully submits that, as a smartwatch also contains a display, the method resulting from an obvious combination of Yuen and Katra would display the ECG rhythm strip on the smartwatch or wristlet.

Regarding claim 23, Yuen further describes wherein the PPG sensor is located on the back of the smartwatch or wristlet (figure 2B).

Regarding claims 24 and 29, Yuen further describes wherein the first electrode is located on the smartwatch or wristlet in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet ([0183]), and the second electrode is located on the smartwatch or wristlet in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side ([0182] - [0183]; figure 7).

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*,

686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

9. Claims 1-6, 10-15, 19-21, and 25-27 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363.

Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims recite sensing heart rate and activity levels of a user, determining a discordance between the heart rate and activity levels, and collecting an electrocardiogram signal in response to determining that a discordance is present.

10. Claims 22-24, 28, and 29 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 9,839,363 in view of Yuen and Katra.

Regarding claims 22 and 28, U.S. Patent No. 9,839,363 does not recite displaying an ECG rhythm strip from the electric signals on the smartwatch or wristlet. However, Yuen describes the use of a smartwatch or wristlet (figure 7), and Katra describes displaying an ECG rhythm strip from the electric signals on a handheld computing device ([0078]). As Yuen, Katra, and U.S. Patent No. 9,839,363 are all directed towards monitoring biometric data and are in a similar field of endeavor, it would have been obvious to a person having ordinary skill in the art at the time the invention was filed to use the smartwatch described by Yuen and displaying an ECG rhythm strip as described by Katra when using the method described by U.S. Patent No. 9,839,363, as doing so advantageously allows the wearer to visually track and monitor his/her cardiac status while implementing any corrective actions in case of an adverse event. The Examiner respectfully submits that, as a smartwatch also contains a display, the method resulting from an obvious combination of Yuen, Katra, and U.S. Patent No. 9,839,363 would display the ECG rhythm strip on the smartwatch or wristlet.

Regarding claim 23, Yuen further describes wherein the PPG sensor is located on the back of the smartwatch or wristlet (figure 2B).

Regarding claims 24 and 29, Yuen further describes wherein the first electrode is located on the smartwatch or wristlet in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet ([0183]), and the second electrode is located on the smartwatch or wristlet in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side ([0182] - [0183]; figure 7).

11. Claims 1, 5, 10, and 14 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of copending Application No. 15/656,745 (reference application). The Examiner notes that a Notice of Allowance has been issued for claims 1-16 of Application No. 15/656,745. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims recite sensing heart rate and activity levels of a user, determining a discordance between the heart rate and activity levels, and collecting an electrocardiogram signal in response to determining that a discordance is present.

This is a provisional nonstatutory double patenting rejection because the patentably indistinct claims have not in fact been patented.

12. Claims 2-4, 6, 11-13, 15, and 19-29 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-16 of copending Application No. 15/656,745 in view of Yuen and Katra.

Regarding claims 2 and 11, Application No. 15/656,745 does not recite wherein the heart rate parameter comprises an indication of a heart rate variability and wherein the arrhythmia is atrial fibrillation. Yuen and Katra also disclose methods for monitoring biometric parameters, including wherein the heart rate parameter comprises an indication of a heart rate variability (Yuen: [0130]) and the arrhythmia is atrial fibrillation (Katra: [0025]). As Yuen, Katra, and Application No. 15/656,745 are all directed towards monitoring biometric data and are in a similar field of endeavor, it would have been obvious to a person having ordinary skill in the art at the time the invention was filed to measure heart rate variability as described by Yuen and monitor for atrial fibrillation as described by Katra, as doing so advantageously allows the resulting method to more comprehensively screen for potential adverse cardiac events.

Regarding claims 3 and 12, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 4 and 13, Yuen further describes wherein the heart rate parameter comprises an indication of a heart rate value ([0130]), and Katra further describes wherein the arrhythmia is atrial fibrillation ([0025]).

Regarding claims 6 and 15, Katra further describes wherein the arrhythmia is atrial fibrillation or ventricular tachycardia ([0025]).

Regarding claims 19 and 25, Yuen further describes wherein the heartrate parameter is a PPG signal ([0134] - [0135]; figures 12A-12B).

Regarding claims 20 and 26, Yuen further describes wherein the heart rate parameter is a heart rate variability value derived from the PPG signal ([0130], [0134] - [0135]).

Regarding claims 21 and 27, Yuen further describes wherein the heart rate parameter is a heartrate derived from the PPG signal ([0130], [0134] - [0135]).

Regarding claims 22 and 28, Katra describes displaying an ECG rhythm strip from the electric signals on a handheld computing device ([0078]). The Examiner respectfully submits that, as a smartwatch also contains a display, the method resulting from an obvious combination of Yuen and Katra would display the ECG rhythm strip on the smartwatch or wristlet.

Regarding claim 23, Yuen further describes wherein the PPG sensor is located on the back of the smartwatch or wristlet (figure 2B).

Regarding claims 24 and 29, Yuen further describes wherein the first electrode is located on the smartwatch or wristlet in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet ([0183]), and the second electrode is located on the smartwatch or wristlet in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side ([0182] - [0183]; figure 7).

This is a provisional nonstatutory double patenting rejection.

Statement on Communication via Internet

13. Communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant in place, the USPTO will not

respond via Internet e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. Where a written authorization is given by the applicant, communications via Internet e-mail, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used. USPTO employees are NOT permitted to initiate communications with applicants via Internet e-mail unless there is a written authorization of record in the patent application by the applicant. The following is a sample authorization form which may be used by applicant:

> "Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application by video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file."

Please refer to MPEP 502.03 for guidance on Communications via Internet.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ankit D. Tejani whose, telephone number is 571-272-5140. The Examiner may normally be reached on Monday through Friday, 8:30AM through 5:00PM EST. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, Applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice. If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno, can be reached by telephone at 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status

of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (in USA or Canada) or 571-272-1000.

/Ankit D Tejani/
Primary Examiner, Art Unit 3792

Notice of References Cited	Application/Control No. 16/158,112	Applicant(s)/Patent Under Reexamination Albert, David E.	
	Examiner ANKIT D TEJANI	Art Unit 3792	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20150122018-A1	05-2015	Yuen; Shelten Gee Jao	G01B21/16	73/384
*	B	US-20140276154-A1	09-2014	Katra; Rodolphe	A61B5/04012	600/509
*	C	US-9839363-B2	12-2017	Albert; David E.	A61B5/0205	1/1
	D					
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	F					
	G					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert, David E.
	Examiner	**Art Unit**
	ANKIT D TEJANI	3792

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61B5/0205,02405,02438,04085,046,0464,1118,681,7267 (keyword text search)	09/25/2019	ADT

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
PALM (inventor search)	09/25/2019	ADT
EAST (search history attached)	09/25/2019	ADT

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert, David E.
	Examiner	Art Unit
	ANKIT D TEJANI	3792

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	01/15/2019	09/25/2019							
	1	÷	✓							
	2	÷	✓							
	3	÷	✓							
	4	÷	✓							
	5	÷	✓							
	6	÷	✓							
	7	÷	-							
	8	÷	-							
	9	-	-							
	10	÷	✓							
	11	÷	✓							
	12	÷	✓							
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	14	÷	✓							
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	27		✓							
	28		✓							
	29		✓							

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	
	Filing Date	
	First Named Inventor	David E. Albert
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A102992 1200US.C2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7846106	B2	2010-12-07	Andrews et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120109675	A1	2012-05-03	Ziegler et al.	
	2	20120289790	A1	2012-11-15	Jain et al.	
	3	20140163393	A1	2014-06-12	McCombie et al.	
	4	20150057512	A1	2015-02-26	Kapoor	
	5	20150305684	A1	2015-10-29	Gross	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	David E. Albert
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A102992 1200US.C2

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature	/ANKIT D TEJANI/	Date Considered	09/25/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ADT/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	David E. Albert
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A102992 1200US.C2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Chris E. Kokoska/	Date (YYYY-MM-DD)	2018-10-11
Name/Print	Christopher E. Kokoska, Esq.	Registration Number	73719

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ADT/

Privacy Act Statement

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	151	alivecor	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 10:31
S2	274	(smartwatch watch wristlet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 10:40
S3	4	(smartwatch watch wristlet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND discord$4 AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 10:40
S4	283	(smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 10:47
S5	274	(smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND (correlat$3 discord$4 correspond$4) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 10:48
S6	6	("20120109675" | "20120289790" | "20140163393" | "20150057512" | "20150305684" | "7846106").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 11:35
S7	646	(albert with david).in.	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 11:35
S8	52	(albert with david).in. AND alivecor	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 11:35
S9	24320	(A61B5/0205,02405,02438,04085,046,0464,1118,681,7267).CPC.	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 11:46
S11	154	S9 AND (smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND (correlat$3 discord$4 correspond$4) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 11:46
S12	2	("20140276154" "20130281816").pn.	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 11:47
S13	159	S9 AND (smartwatch watch wristlet bracelet) AND (sens$3 with (activity movement)) AND (heart$rate) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 14:03
S14	4397	(heart with rate) same (movement displacement activity motion) same (discord$5 correlat$4)	US-PGPUB;	OR	ON	2019/09/25 16:36

			USPAT; USOCR			
S15	1702	S9 AND S14	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 16:36
S16	720	S15 AND ($5arrhythmia $5cardia) AND (electrocardiogra$3 ecg ekg)	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 16:37
S17	362	S15 AND ($5arrhythmia $5cardia) AND (electrocardiogra$3 ecg ekg) AND @pd<"20150513"	US-PGPUB; USPAT; USOCR	OR	ON	2019/09/25 16:37

EAST Search History (Interference)

<This search history is empty>

09/25/2019 20:15:27
C:\Users\atejani\Documents\EAST\Workspaces\16158112.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: David E. Albert Serial No. 16/158,112 Filed: October 11, 2018 For: DISCORDANCE MONITORING	EXAMINER: TEJANI, ANKIT D. ART UNIT: 3792 CONF NO.: 7079

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO RESTRICTION REQUIREMENT

Sir:

In response to the restriction requirement mailed on February 8, 2019, Applicant respectfully requests the Examiner to consider the following:

A listing of the claims begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

IN THE CLAIMS

1. (Previously presented) A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor of a wearable device comprising a wristlet or a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor of the wearable device;

determining a discordance is present between the activity level value and the heart rate parameter;

based on the presence of the discordance, indicating to the user, using the wearable device, a possibility of an arrhythmia being present;

receiving electric signals of the user from ECG electrodes of the smartwatch; and

displaying an ECG rhythm strip from the electric signals.

2. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

3. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

4. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

5. (Previously presented) The method according to claim 1, wherein indicating to the user further comprises: instructing the user to record an electrocardiogram ("ECG") using the wearable device.

6. (Previously presented) The method according to claim 1, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

7. (Previously presented) The method according to claim 1, wherein the first sensor comprises an accelerometer.

8. (Previously presented) The method according to claim 1, wherein the first sensor comprises a gyroscope.

9. (Cancelled)

10. (Previously presented) A smartwatch, comprising:

a processor;

a first sensor configured to sense an activity level value of a user, wherein the first sensor is coupled to the processor;

a photopletysmogram (PPG) sensor configured to sense a heart rate parameter of the user when the activity level value is resting, wherein the PPG sensor is coupled to the processor; and

a non-transitory computer readable storage medium encoded with a computer program including instructions executable by the processor to cause the processor to:

determine if a discordance is present between the activity level value of the user and the heart rate parameter of the user;

based on the presence of the discordance, indicate to the user a possibility of an arrhythmia being present;

receive electric signals of the user from ECG electrodes of the smartwatch if the possibility of an arrhythmia is indicated; and

display an ECG rhythm strip from the electric signals.

11. (Previously presented) The smartwatch according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

12. (Previously presented) The smartwatch according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

13. (Previously presented) The smartwatch according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate value, and wherein the arrhythmia is atrial fibrillation.

14. (Previously presented) The smartwatch according to claim 10, wherein indicating to the user further comprises: instructing the user to record an electrocardiogram ("ECG") using the wearable device.

15. (Previously presented) The smartwatch according to claim 10, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

16. (Previously presented) The smartwatch according to claim 10, wherein the first sensor comprises an accelerometer.

17. (Previously presented) The smartwatch according to claim 10, wherein the first sensor comprises a gyroscope.

18. (Cancelled)

REMARKS

In response to the Restriction Requirement mailed on February 8, 2019, Applicant respectfully submits that the Restriction Requirement was improper in view of the Preliminary Amendment filed on February 6, 2019. During a call with the examiner on August 8, 2019, the Examiner indicated that the Restriction Requirement mailed on February 8, 2019 would be withdrawn, the claim amendments provided in the Preliminary Amendment of February 6, 2019 would be entered (as reflected in the listing of the claims, above), and a new Restriction Requirement would not be issued. Applicant thanks the Examiner for his attention to the matter. Merely as a precautionary measure to avoid undue accidental abandonment, in the case the Preliminary Amendment filed on February 6, 2019 is deemed improper, Applicant elects Group I, claims 1-8 without traverse. It should be reiterated that such election should only be considered as a last resort, as Applicant believes that the Restriction Requirement should be withdrawn in view of the previously-filed Preliminary amendment.

If the Examiner believes a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Bill Jacobs at (408) 341-3091.

If there are any additional charges, please charge them to Deposit Account No. 090528.

Respectfully submitted,

WOMBLE BOND DICKINSON (US) LLP

Date: August 8, 2019

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

1841 Page Mill Road
Suite 200
Palo Alto, CA 94304
(408) 341-3091

Electronic Patent Application Fee Transmittal	
Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2
Filed as Large Entity	
Filing Fees for **Utility under 35 USC 111(a)**	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 4 months with $0 paid	1254	1	2200	2200
Miscellaneous:				
			Total in USD ($)	**2200**

Electronic Acknowledgement Receipt	
EFS ID:	36822502
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	08-AUG-2019
Filing Date:	11-OCT-2018
Time Stamp:	16:44:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$2200
RAM confirmation Number	E201988G45065291
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		A102992_1200USC2_Resp_Rest.pdf	601292 3db83ed660da5b9d33997823ad7a87fab8b699c2	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response to Election / Restriction Filed	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	5

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30798 1356543256a7662dfc1ea5c2dcebfd950f71d146	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	632090		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/158,112	Filing Date 10/11/2018	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)			
FOR	NUMBER FILED	NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $460 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	08/08/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/PATRICIA F LEWIS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2

CONFIRMATION NO. 7079

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

PUBLICATION NOTICE

Title:DISCORDANCE MONITORING

Publication No.US-2019-0104948-A1
Publication Date:04/11/2019

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2	7079

151512 7590 02/08/2019

WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
TEJANI, ANKIT D	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
02/08/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketing@wbd-us.com

Office Action Summary	**Application No.** 16/158,112	**Applicant(s)** Albert, David E.	
	Examiner ANKIT D TEJANI	**Art Unit** 3792	**AIA Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 25 October 2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-8 and 10-17 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☐ Claim(s) _____ is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☑ Claim(s) 1-8 and 10-17 are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-8, drawn to a cardiac monitoring method.

II. Claims 10-17, drawn to a smartwatch.

3. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are directed to related products. The related inventions are distinct if: (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, the inventions as claimed can have a materially different design, mode of operation, function, or effect. The smartwatch of Invention II requires the use of a

photoplethysmograph sensor, which is not an essential component of the method recited in Invention I. The method of Invention I can be used without a photoplethysmograph sensor, which is an essential component of the smartwatch recited in Invention II. Furthermore, the inventions as claimed do not encompass overlapping subject matter and there is nothing of record to show them to be obvious variants.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because one or more of the following reasons apply: Each group of invention has separate classification and separate status in the art. Further, each group of invention requires a different field of search and different search terms and databases because each group of invention possesses a distinct element not possessed by the other groups of invention as set forth above.

4. Applicant is advised that the reply to this requirement to be complete must include (i) an election of an invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time

of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other invention.

5. For Applications listing joint inventors: Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be corrected in compliance with 37 CFR 1.48(a) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. A request to correct inventorship under 37 CFR 1.48(a) must be accompanied by an application data sheet in accordance with 37 CFR 1.76 that identifies each inventor by his or her legal name and by the processing fee required under 37 CFR 1.17(i).

6. For restrictions between product or apparatus claims and process claims: The examiner has required restriction between product or apparatus claims and process claims. Where applicant elects claims directed to the product/apparatus, and all product/apparatus claims are subsequently found allowable, withdrawn process claims

that include all the limitations of the allowable product/apparatus claims should be considered for rejoinder. All claims directed to a nonelected process invention must include all the limitations of an allowable product/apparatus claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product/apparatus claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product/apparatus are found allowable, an otherwise proper restriction requirement between product/apparatus claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product/apparatus claim will not be rejoined. See MPEP § 821.04. Additionally, in order for rejoinder to occur, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product/apparatus claims. **Failure to do so may result in no rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Statement on Communication via Internet

7. Communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant in place, the USPTO will not

respond via Internet e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. Where a written authorization is given by the applicant, communications via Internet e-mail, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used. USPTO employees are NOT permitted to initiate communications with applicants via Internet e-mail unless there is a written authorization of record in the patent application by the applicant. The following is a sample authorization form which may be used by applicant:

> "Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application by video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file."

Please refer to MPEP 502.03 for guidance on Communications via Internet.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ankit D. Tejani whose, telephone number is 571-272-5140. The Examiner may normally be reached on Monday through Friday, 8:30AM through 5:00PM EST. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, Applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice. If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno, can be reached by telephone at 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status

of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (in USA or Canada) or 571-272-1000.

/Ankit D Tejani/
Examiner, Art Unit 3792

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/158,112	Albert, David E.
	Examiner	**Art Unit**
	ANKIT D TEJANI	3792

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS											
☐ Claims renumbered in the same order as presented by applicant					☐ CPA		☐ T.D.		☐ R.1.47		
CLAIM		**DATE**									
Final	Original	01/15/2019									
	1	÷									
	2	÷									
	3	÷									
	4	÷									
	5	÷									
	6	÷									
	7	÷									
	8	÷									
	9	-									
	10	÷									
	11	÷									
	12	÷									
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	16	÷									
	17	÷									
	18	-									

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7079

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
16/158,112	10/11/2018	600	3792	A102992 1200US.C2

APPLICANTS
AliveCor, Inc., Residence Not Provided;

INVENTORS
David E. Albert, Oklahoma City, OK;

**** CONTINUING DATA ***************************
This application is a CON of 15/656,745 07/21/2017
which is a CON of 15/154,849 05/13/2016 PAT 9839363
which claims benefit of 62/161,092 05/13/2015

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
10/30/2018

Foreign Priority claimed ❑ Yes ☑ No 35 USC 119(a-d) conditions met ❑ Yes ❑ No Verified and Acknowledged /ANKIT D TEJANI/ Examiner's Signature	❑ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		OK	7	16	2

ADDRESS
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037
UNITED STATES

TITLE
DISCORDANCE MONITORING

FILING FEE RECEIVED		
1720	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	❑ All Fees ❑ 1.16 Fees (Filing) ❑ 1.17 Fees (Processing Ext. of time) ❑ 1.18 Fees (Issue) ❑ Other _____ ❑ Credit

BIB (Rev. 05/07).

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	)	
	)	Examiner: Tejani, Ankit D.
David E. Albert	)	
	)	Art Unit: 3792
Application No: 16/158,112	)	
	)	Atty. Docket No: A102992 1200US.C2
Filed: October 11, 2018	)	
	)	
For: DISCORDANCE MONITORING	)	

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In connection with the present application, please enter the following amendments and consider the following remarks prior to examination on the merits.

Amendments to the claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks begin on page 6 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

What is claimed is:

1. (Currently amended) A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor on ~~of a wearable device comprising~~ a wristlet or a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor ~~of~~ on the smartwatch or wristlet ~~wearable device~~;

determining a discordance is present between the activity level value and the heart rate parameter;

based on the presence of the discordance, indicating to the user, using the smartwatch or wristlet, ~~wearable device, of~~ a possibility of an arrhythmia being present; and

receiving electric signals of the user from an electrocardiogram sensor ("ECG") on the smartwatch or wristlet to confirm a presence of the arrhythmia, wherein the ECG sensor comprises a first electrode and a second electrode ~~ECG electrodes of the smartwatch; and~~

~~displaying an ECG rhythm strip from the electric signals~~.

2. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

3. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

4. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

5. (Currently amended) The method according to claim 1, wherein indicating to the user further comprises: instructing the user to record an ECG ~~electrocardiogram ("ECG")~~ using the smartwatch or wristlet~~wearable device~~.

6. (Previously presented) The method according to claim 1, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Currently amended) A smartwatch or wristlet, comprising:

a processor;

a first sensor configured to sense an activity level value of a user, wherein the first sensor is coupled to the processor;

a photopletysmogram ("PPG") sensor configured to sense a heart rate parameter of the user when the activity level value is resting, wherein the PPG sensor is coupled to the processor; ~~and~~

an electrocardiogram ("ECG") sensor configured to sense electrical signals of a heart, wherein the ECG sensor comprises a first electrode and a second electrode, and wherein the ECG sensor is coupled to the processor; and

a non-transitory computer readable storage medium encoded with a computer program including instructions executable by the processor to cause the processor to:

determine if a discordance is present between the activity level value of the user and the heart rate parameter of the user;

based on the presence of the discordance, indicate to the user a possibility of an arrhythmia being present; and

receive electric signals of the user from the ECG sensor ~~electrodes of the smartwatch if the possibility of an~~ to confirm the presence of the arrhythmia ~~is indicated; and~~

~~display an ECG rhythm strip from the electric signals~~.

11. (Currently amended) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

12. (Currently amended) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

13. (Currently amended) The smartwatch or wristlet according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate value, and wherein the arrhythmia is atrial fibrillation.

14. (Currently amended) The smartwatch or wristlet according to claim 10, wherein indicating to the user further comprises: instructing the user to record an ~~electrocardiogram ("ECG")~~ using the ~~wearable device~~ ECG sensor.

15. (Currently amended) The smartwatch or wristlet according to claim 10, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraentricular tachycardia, and ventricular tachycardia.

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (New) The smartwatch or wristlet according to claim 10, wherein the heartrate parameter is a PPG signal.

20. (New) The smartwatch or wristlet according to claim 19, wherein the heartrate parameter is a heartrate variability ("HRV") value, wherein the HRV value is derived from the PPG signal.

21. (New) The smartwatch or wristlet according to claim 19, wherein the heartrate parameter is a heartrate, wherein the heartrate is derived from the PPG signal.

22. (New) The smartwatch or wristlet according to claims 10, the processing device further to: display an ECG rhythm strip from the electric signals.

23. (New) The smartwatch or wristlet according to claim 10, wherein the PPG sensor is located on the back of the smartwatch or wristlet.

24. (New) The smartwatch or wristlet according to claim 10, wherein the first electrode is located on the smartwatch or wristlet where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet, and the second electrode is located on the smartwatch or wristlet where the user must actively contact the second electrode with a second side of the user's body opposite from the first side.

25. (New) The method according to claim 1, wherein the heartrate parameter is a PPG signal.

26. (New) The smartwatch or wristlet according to claim 25, wherein the heartrate parameter is a heartrate variability ("HRV") value, wherein the HRV value is derived from the PPG signal.

27. (New) The smartwatch or wristlet according to claim 25, wherein the heartrate parameter is a heartrate, wherein the heartrate is derived from the PPG signal.

28. (New) The smartwatch or wristlet according to claim 1 further comprising: displaying an ECG rhythm strip from the electric signals on the smartwatch or wristlet.

29. (New) The smartwatch or wristlet according to claim 1, wherein the first electrode is located on the smartwatch or wristlet in a location where the first electrode contacts a first side of the user's body while the user wears the smartwatch or wristlet, and the second electrode is located on the smartwatch or wristlet in a location where the user must actively contact the second electrode with a second side of the user's body opposite from the first side.

REMARKS

Applicant requests reconsideration of this application as amended.

Conclusion

Applicant respectfully submits that all of the pending claims are in condition for allowance. A notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 341-3091. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 09-0528.

Should the Examiner have any questions concerning this matter, please contact the undersigned.

Respectfully submitted,
WOMBLE BOND DICKINSON (US) LLP

Date: February 6, 2019

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

Electronic Patent Application Fee Transmittal

Application Number:	16158112
Filing Date:	11-Oct-2018
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	William D Jacobs Jr/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	3	100	300
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**300**

Electronic Acknowledgement Receipt	
EFS ID:	35078407
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	06-FEB-2019
Filing Date:	11-OCT-2018
Time Stamp:	16:40:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$300
RAM confirmation Number	020719INTEFSW00003515090528
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		A102992_1200USC2_Pre_Amendment.pdf	486950 b775ca53435b5afd87426728a5fdaa6dd565308c	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	6

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30336 9ebbe690af1cb879a23864a5146177f31a5d2b8d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	517286		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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United States Patent and Trademark Office
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ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA GA 30357-0037

MAILED
JAN 08 2019
OFFICE OF PETITIONS

Doc Code: TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 16/158,112

1. THE REQUEST FILED October 11, 2018 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination

A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to Irvin Dingle at (571)272-3210, Office of Petitions.

Irvin Dingle
/Irvin Dingle/
[*Signature*]

Lead Paralegal Specialist
(Title)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/158,112	10/11/2018	3792	1720	A102992 1200US.C2	16	2

CONFIRMATION NO. 7079

UPDATED FILING RECEIPT

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

OC000000104878469

Date Mailed: 01/04/2019

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

David E. Albert, Oklahoma City, OK;

Applicant(s)

AliveCor, Inc., Residence Not Provided;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 15/656,745 07/21/2017
which is a CON of 15/154,849 05/13/2016 PAT 9839363
which claims benefit of 62/161,092 05/13/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/30/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/158,112**

Projected Publication Date: 04/11/2019

Non-Publication Request: No

Early Publication Request: No
Title

DISCORDANCE MONITORING

Preliminary Class

607

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/158,112

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	16 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 460 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1720

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	**16/158,112**
Applicant	:	**David E. Albert**
Filed	:	**October 11, 2018**
Title	:	**DISCORDANCE MONITORING**
Confirmation No	:	**7079**
Examiner	:	**Unknown**
Docket No.	:	**A102992 1200US.C2**
Customer No.	:	**151512**

RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

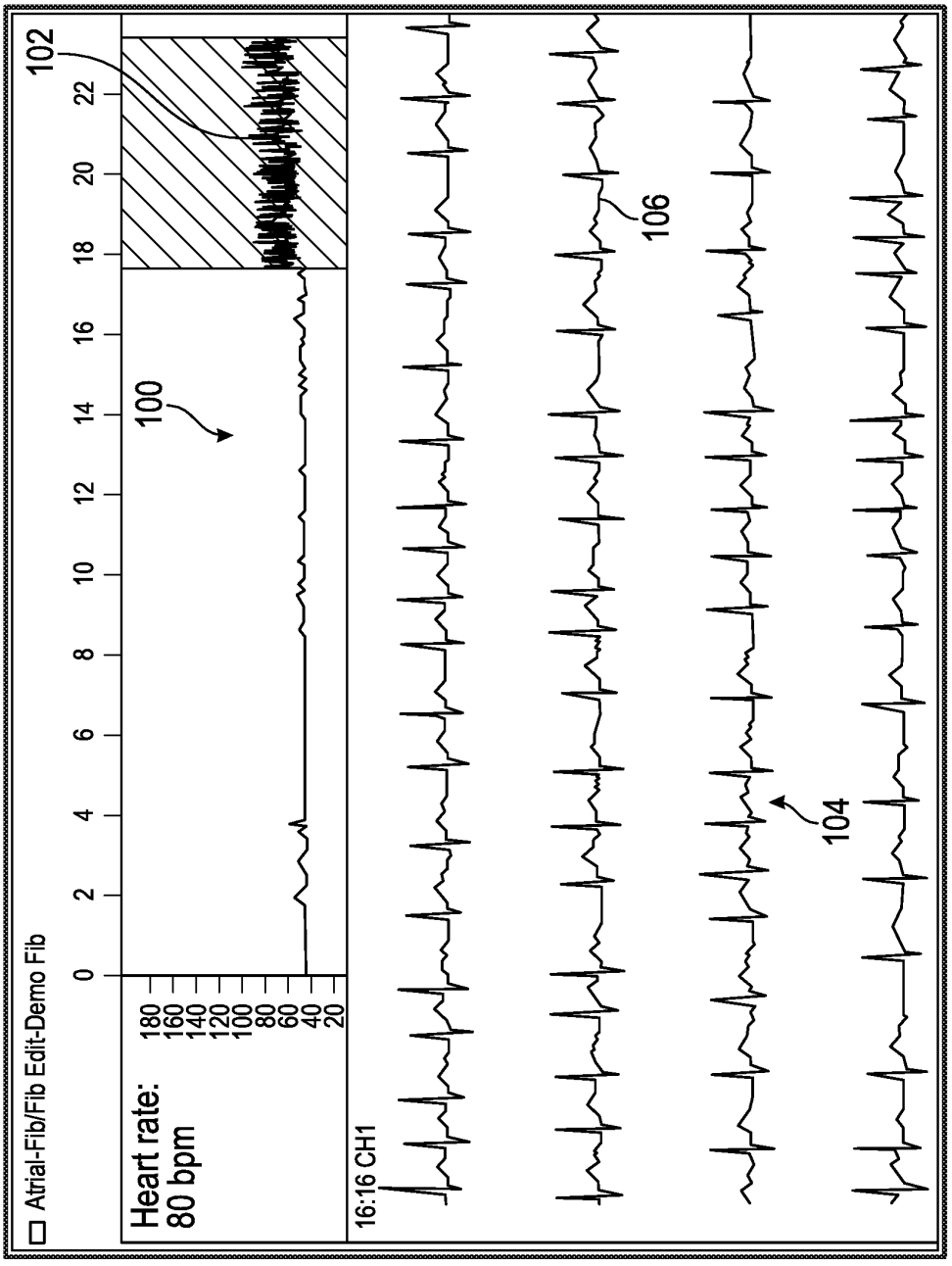
In response to the Notice to File Corrected Application Papers mailed November 1, 2018, Applicant submits Replacement Drawings in 4 pages. Applicant requests that sheets 1-4 of the pending drawings be replaced with the attached replacement drawings. No new matter has been added. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 09-0528.

Date: January 2, 2019

Respectfully submitted,

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758
Attorney for Applicant

Womble Bond Dickinson (US) LLP
1841 Page Mill Road
Suite 200
Palo Alto, CA 94304
408-341-3091 (Telephone)


Atrial-Fib/Fib Edit-Demo Fib
0
2
4
6
8
10
12
14
16
18
20
22
102
100
Heart rate:
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180
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140
120
100
80
60
40
20
16:16 CH1
106
104

FIG. 1

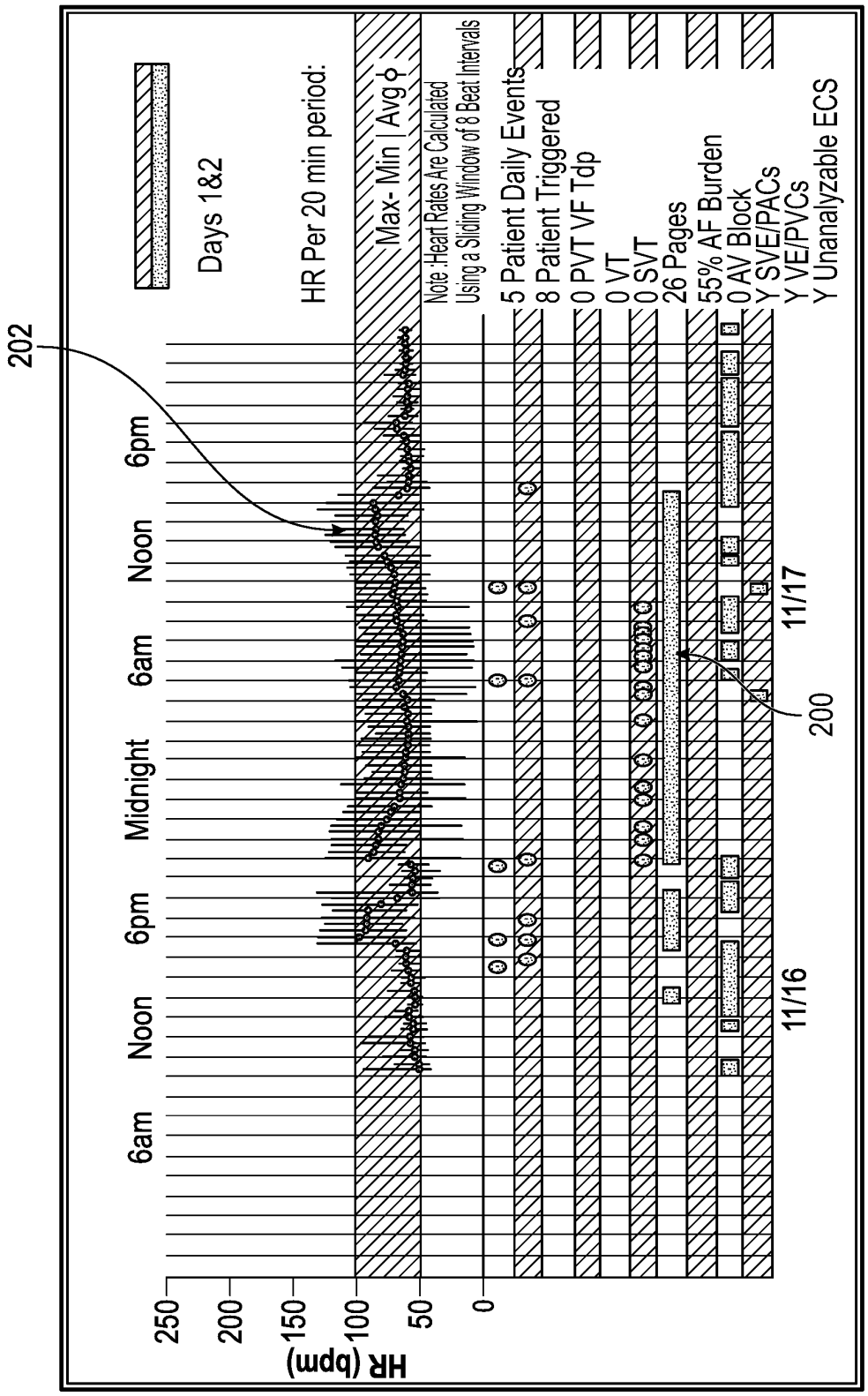
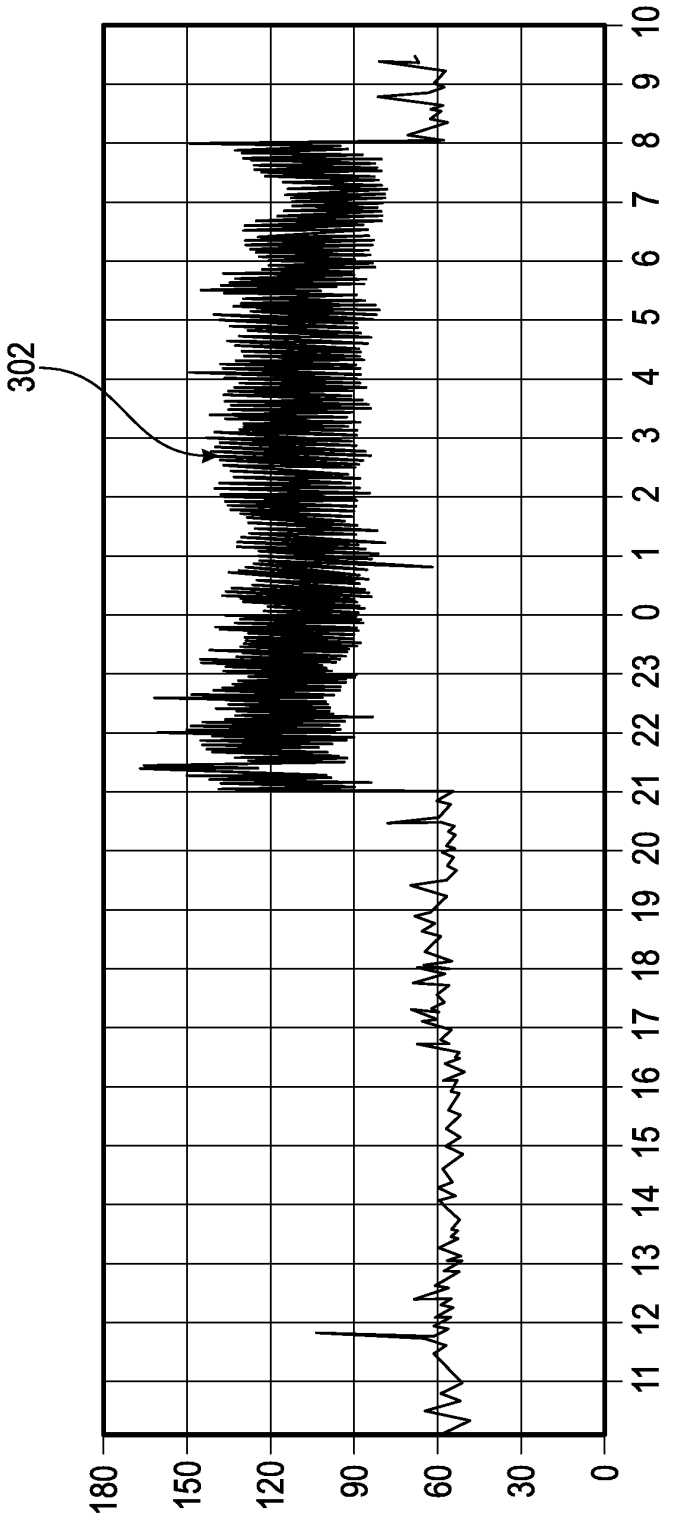

202
Days 1&2
HR Per 20 min period:
Max- Min | Avg
Note :Heart Rates Are Calculated
Using a Sliding Window of 8 Beat Intervals
5 Patient Daily Events
8 Patient Triggered
0 PVT VF Tdp
0 VT
0 SVT
26 Pages
55% AF Burden
0 AV Block
Y SVE/PACs
Y VE/PVCs
Y Unanalyzable ECS
6am
Noon
6pm
Midnight
6am
Noon
6pm
11/16
11/17
200
HR (bpm)
250
200
150
100
50
0

FIG. 2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10

FIG. 3

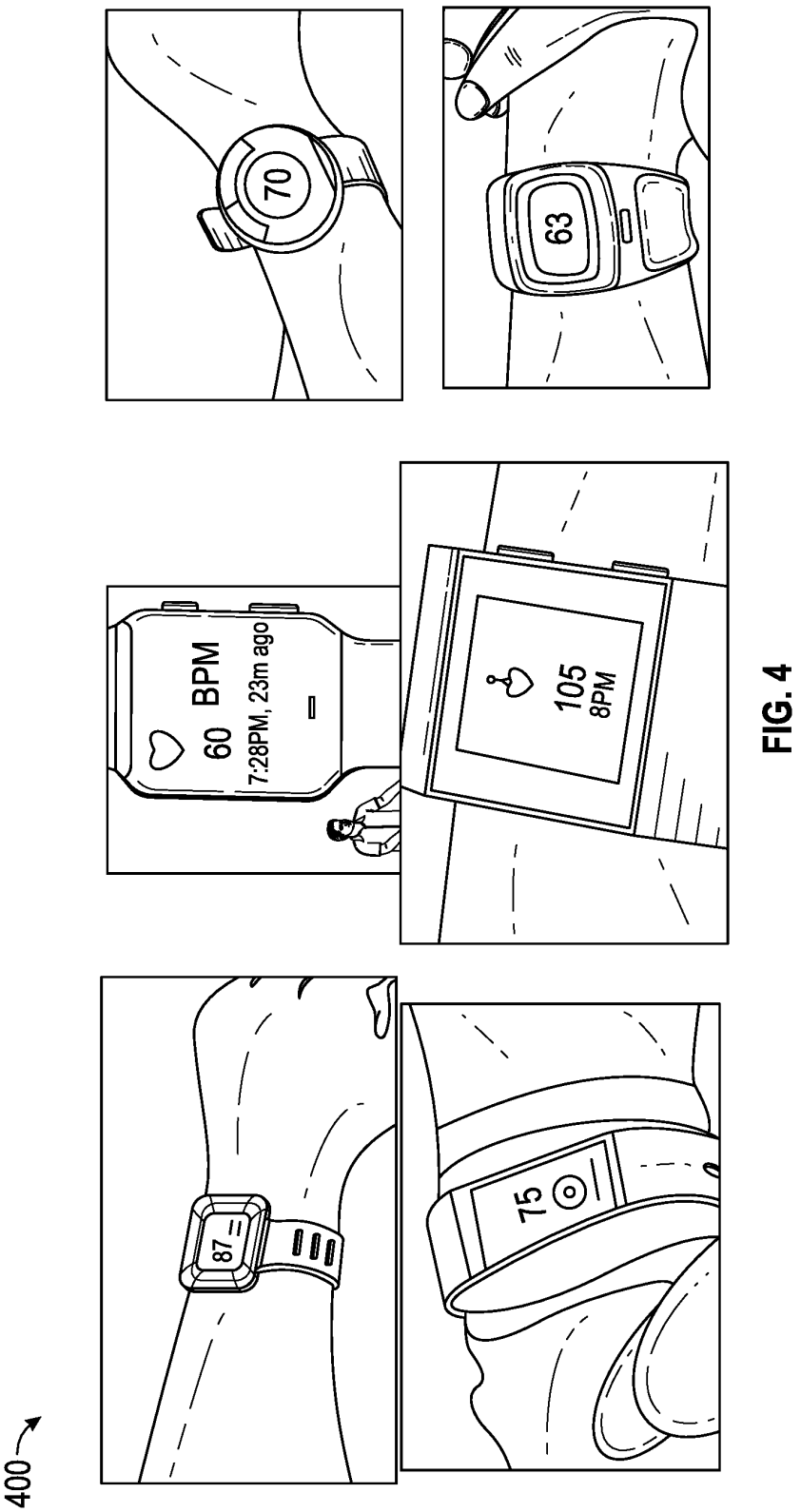

FIG. 4

Electronic Acknowledgement Receipt	
EFS ID:	34738398
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	02-JAN-2019
Filing Date:	11-OCT-2018
Time Stamp:	15:39:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	A102992_1200USC2_Resp_Corr_App.pdf	59490 924bc5293a369837be214494d089057733 17465d	no	1

Warnings:

Information:					
2	Drawings-other than black and white line drawings	A102992_1200USC2_Repl_Drawings.pdf	125538 f018bda821cb02e56413add00203ee9e03754030	no	4
Warnings:					
Information:					
			Total Files Size (in bytes):	185028	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 16158112 Document Date: 01/02/2019

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

Form Revision Date: August 26, 2013

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/158,112	10/11/2018	3766	1720	A102992 1200US.C2	16	2

CONFIRMATION NO. 7079

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

FILING RECEIPT

OC000000103491743

Date Mailed: 11/01/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

David E. Albert, Oklahoma City, OK;

Applicant(s)

AliveCor, Inc., Residence Not Provided;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 15/656,745 07/21/2017
which is a CON of 15/154,849 05/13/2016 PAT 9839363
which claims benefit of 62/161,092 05/13/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/30/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/158,112**

Projected Publication Date: To Be Determined - pending completion of Corrected Papers

Non-Publication Request: No

Early Publication Request: No

Title

DISCORDANCE MONITORING

Preliminary Class

607

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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NOT GRANTED

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/158,112

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	16 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 460 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1720

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/158,112	10/11/2018	David E. Albert	A102992 1200US.C2

CONFIRMATION NO. 7079

151512
WOMBLE BOND DICKINSON (US) LLP/AliveCor
Attn: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

FORMALITIES LETTER

OC000000103491745

Date Mailed: 11/01/2018

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - The drawings submitted to the Office are not electronically reproducible because portions of figures 1-4 are missing and/or blurry.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ldvan/

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	)	
	)	Examiner: Unassigned
David E. Albert	)	
	)	Art Unit: 3766
Application No: 16/158,112	)	
	)	Atty. Docket No: A102992 1200US.C2
Filed: October 11, 2018	)	
	)	
For: DISCORDANCE MONITORING	)	

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In connection with the present application, please enter the following amendments and consider the following remarks prior to examination on the merits.

Amendments to the claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks begin on page 5 of this paper.

Electronic Acknowledgement Receipt	
EFS ID:	34120883
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	William D Jacobs Jr/Aaron Dunn
Filer Authorized By:	William D Jacobs Jr
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	25-OCT-2018
Filing Date:	
Time Stamp:	19:10:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		A102992_1200USC2_Pre_Amend.pdf	69724 ed266bdba7eddf1e710064f718af38e7a9fc9480	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	5	5
	Claims	2	4
	Preliminary Amendment	1	1
Warnings:			
Information:			
	Total Files Size (in bytes):	69724	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

Applicant requests reconsideration of this application as amended.

Conclusion

Applicant respectfully submits that all of the pending claims are in condition for allowance. A notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 341-3091. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 09-0528.

Should the Examiner have any questions concerning this matter, please contact the undersigned.

Respectfully submitted,
WOMBLE BOND DICKINSON (US) LLP

Date: October 25, 2018

/Bill Jacobs/
William D. Jacobs, Jr.
Reg. No. 74,758

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

What is claimed is:

1. (Currently amended) A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor of a wearable device comprising a wristlet or a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor of the wearable device;

determining a discordance is present between the activity level value and the heart rate parameter; ~~and~~

based on the presence of the discordance, indicating to the user, using the wearable device, ~~of~~ a possibility of an arrhythmia being present;

receiving electric signals of the user from ECG electrodes of the smartwatch; and

displaying an ECG rhythm strip from the electric signals.

2. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

3. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

4. (Previously presented) The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

5. (Previously presented) The method according to claim 1, wherein indicating to the user further comprises: instructing the user to record an electrocardiogram ("ECG") using the wearable device.

6. (Previously presented) The method according to claim 1, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

7. (Previously presented) The method according to claim 1, wherein the first sensor comprises an accelerometer.

8. (Previously presented) The method according to claim 1, wherein the first sensor comprises a gyroscope.

9. (Cancelled)

10. (Currently amended) A ~~wearable device comprising a wristlet or a~~ smartwatch, comprising:

a processor;

a first sensor configured to sense an activity level value of a user, wherein the first sensor is coupled to the processor;

a ~~second~~ photopletysmogram (PPG) sensor configured to sense a heart rate parameter of the user when the activity level value is resting, wherein the ~~second~~ PPG sensor is coupled to the processor; and

a non-transitory computer readable storage medium encoded with a computer program including instructions executable by the processor to cause the processor to:

determine if a discordance is present between the activity level value of the user and the heart rate parameter of the user;

based on the presence of the discordance, indicate to the user a possibility of an arrhythmia being present;

receive electric signals of the user from ECG electrodes of the smartwatch if the possibility of an arrhythmia is indicated; and

display an ECG rhythm strip from the electric signals.

11. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

12. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

13. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein the heart rate parameter comprises an indication of a heart rate value, and wherein the arrhythmia is atrial fibrillation.

14. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein indicating to the user further comprises: instructing the user to record an electrocardiogram ("ECG") using the wearable device.

15. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

16. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein the first sensor comprises an accelerometer.

17. (Currently amended) The ~~wearable device~~smartwatch according to claim 10, wherein the first sensor comprises a gyroscope.

18. (Cancelled)

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 16158112 Document Date: 10/11/2018

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

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- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
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Form Revision Date: August 26, 2013

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	David E. Albert	Nonprovisional Application Number (if known):	
Title of Invention:	DISCORDANCE MONITORING		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Chris E. Kokoska/	Date October 11, 2018
Name (Print/Typed) Christopher E. Kokoska, Esq.	Practitioner Registration Number 73,719

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	
	Filing Date	
	First Named Inventor	David E. Albert
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A102992 1200US.C2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7846106	B2	2010-12-07	Andrews et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120109675	A1	2012-05-03	Ziegler et al.	
	2	20120289790	A1	2012-11-15	Jain et al.	
	3	20140163393	A1	2014-06-12	McCombie et al.	
	4	20150057512	A1	2015-02-26	Kapoor	
	5	20150305684	A1	2015-10-29	Gross	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	David E. Albert
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A102992 1200US.C2

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	David E. Albert
	Art Unit	
	Examiner Name	
	Attorney Docket Number	A102992 1200US.C2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Chris E. Kokoska/	Date (YYYY-MM-DD)	2018-10-11
Name/Print	Christopher E. Kokoska, Esq.	Registration Number	73719

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Filer:	Christopher E. Kokoska/Aaron Dunn
Attorney Docket Number:	A102992 1200US.C2

Filed as Large Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4000	4000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**5860**

Electronic Acknowledgement Receipt	
EFS ID:	33987076
Application Number:	16158112
International Application Number:	
Confirmation Number:	7079
Title of Invention:	DISCORDANCE MONITORING
First Named Inventor/Applicant Name:	David E. Albert
Customer Number:	151512
Filer:	Christopher E. Kokoska/Aaron Dunn
Filer Authorized By:	Christopher E. Kokoska
Attorney Docket Number:	A102992 1200US.C2
Receipt Date:	11-OCT-2018
Filing Date:	
Time Stamp:	18:27:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$5860
RAM confirmation Number	101218INTEFSW00005228090528
Deposit Account	090528
Authorized User	Aaron Dunn
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	A102992_1200USC2_Dec.pdf	129492 1ea3035770256f73f9db05697679682fe523bca9	no	1
Warnings:					
Information:					
2	Drawings-other than black and white line drawings	A102992_1200USC2_Drawings.pdf	202320 763259249263f14d87f54a66ad2d60a755d905d9	no	7
Warnings:					
Information:					
3	Application Data Sheet	A102992_1200USC2_ADS.pdf	2048374 3f95f8a39013bad24da81a8d9f1b3b78cddaea8a	no	8
Warnings:					
Information:					
4		A102992_1200USC2_Spec.pdf	224376 1fe14d99182d3cb225ef1a1659ed1725a1dcb9e3	yes	31

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	27
Claims	28	30
Abstract	31	31

Warnings:					
Information:					
5	TrackOne Request	A102992_1200USC2_TrackOne.pdf	143105 b78a62ec12f4c853f6a1d6e30755cf62d09a9f4e	no	2

Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	A102992_1200USC2_IDS.pdf	1143811 6180fe5f8adc9b1c755639cd318ef9e0f688eb7a	no	4
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	40461 63386bea8b75d03ee1339739ee4c62ea6ea95a0c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3931939		

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<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DISCORDANCE MONITORING

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/154,849 filed on May 13, 2016

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

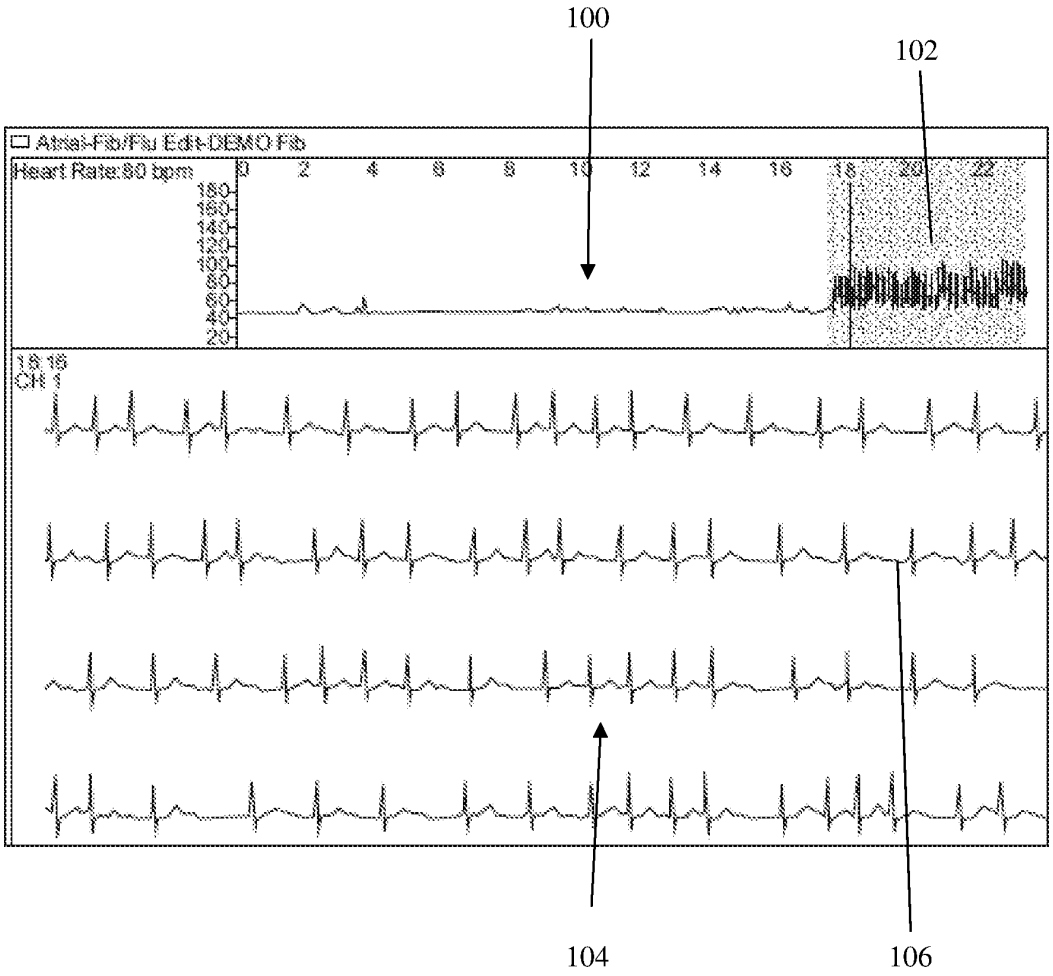
Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: David E. Albert Date (Optional): 6-13-2016

Signature: David E. Albert

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.


100
102
Atrial-Fib/Flu Edit-DEMO Fib
Heart Rate:80 bpm
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180
160
140
120
100
80
60
40
15:15
CH 1
104
106

FIG. 1

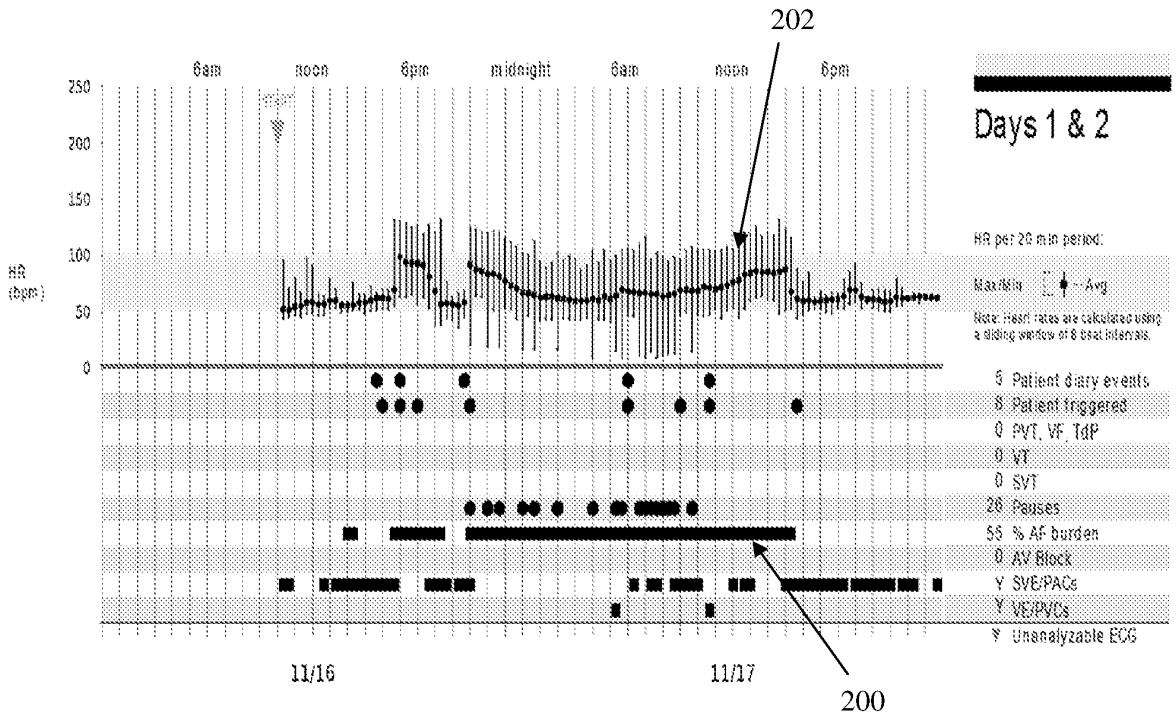
202
6am
noon
6pm
midnight
6am
noon
6pm
250
200
150
100
50
0
HR (bpm)
Days 1 & 2
HR per 20 min period:
Max/Min
Avg
Note: Heart rates are calculated using a sliding window of 8 beat intervals.
6 Patient diary events
8 Patient triggered
0 PVT, VF, TdP
0 VT
0 SVT
26 Pauses
55 % AF burden
0 AV Block
Y SVE/PACs
Y VE/PVCs
Y Unanalyzable ECG
11/16
11/17
200

FIG. 2

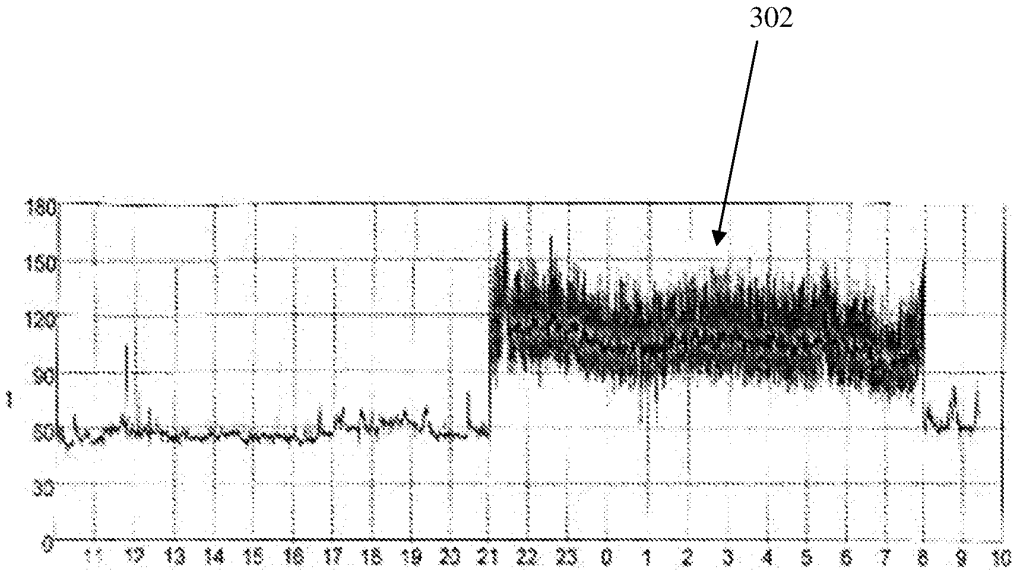
302
180
150
120
90
60
30
0
11 12 13 14 15 16 17 18 19 20 21 22 23 0 1 2 3 4 5 6 7 8 9 10

FIG. 3

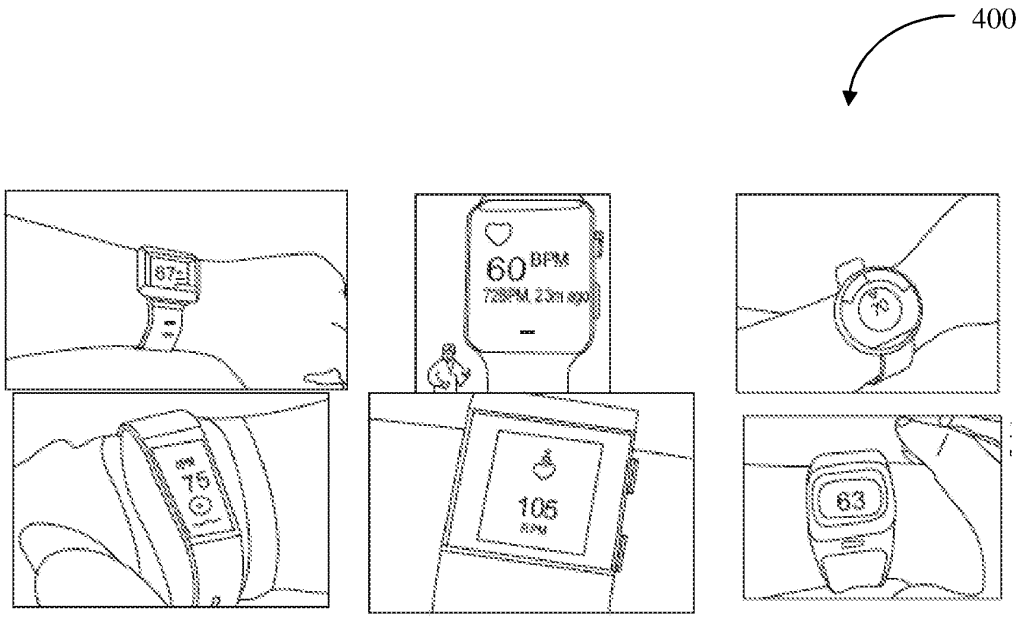

FIG. 4

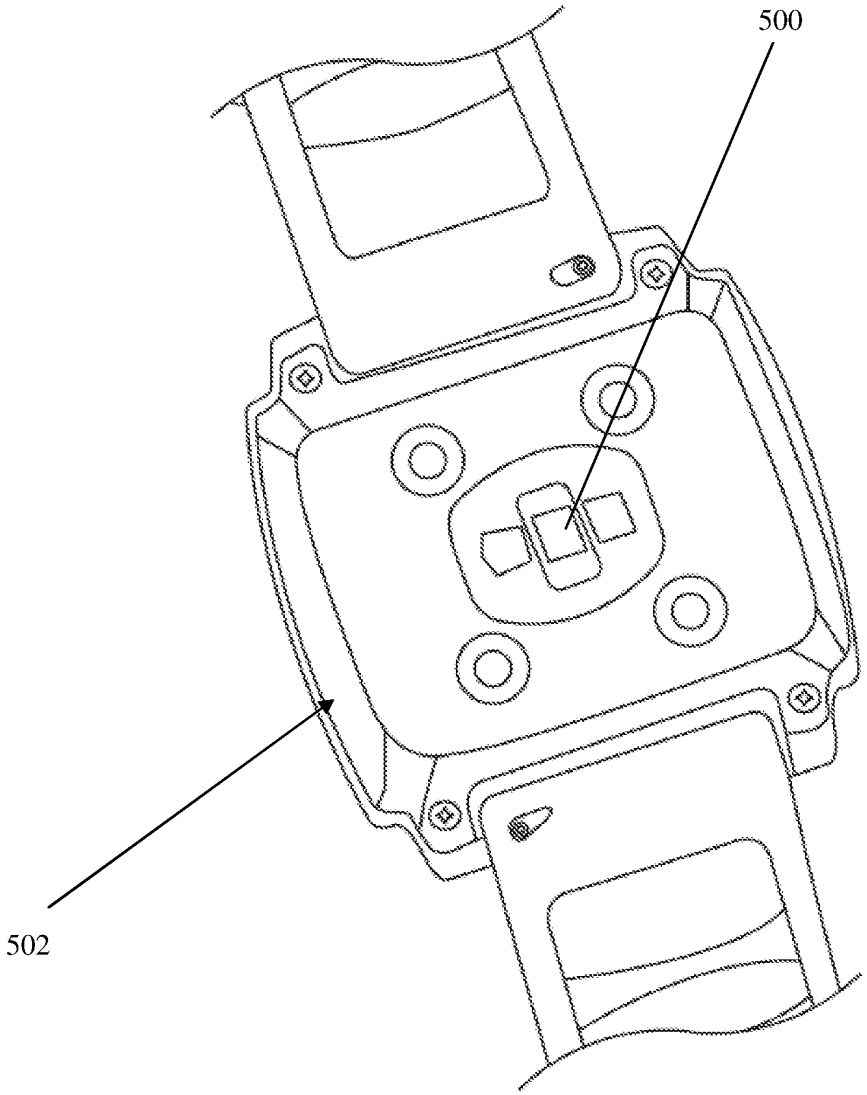

FIG. 5

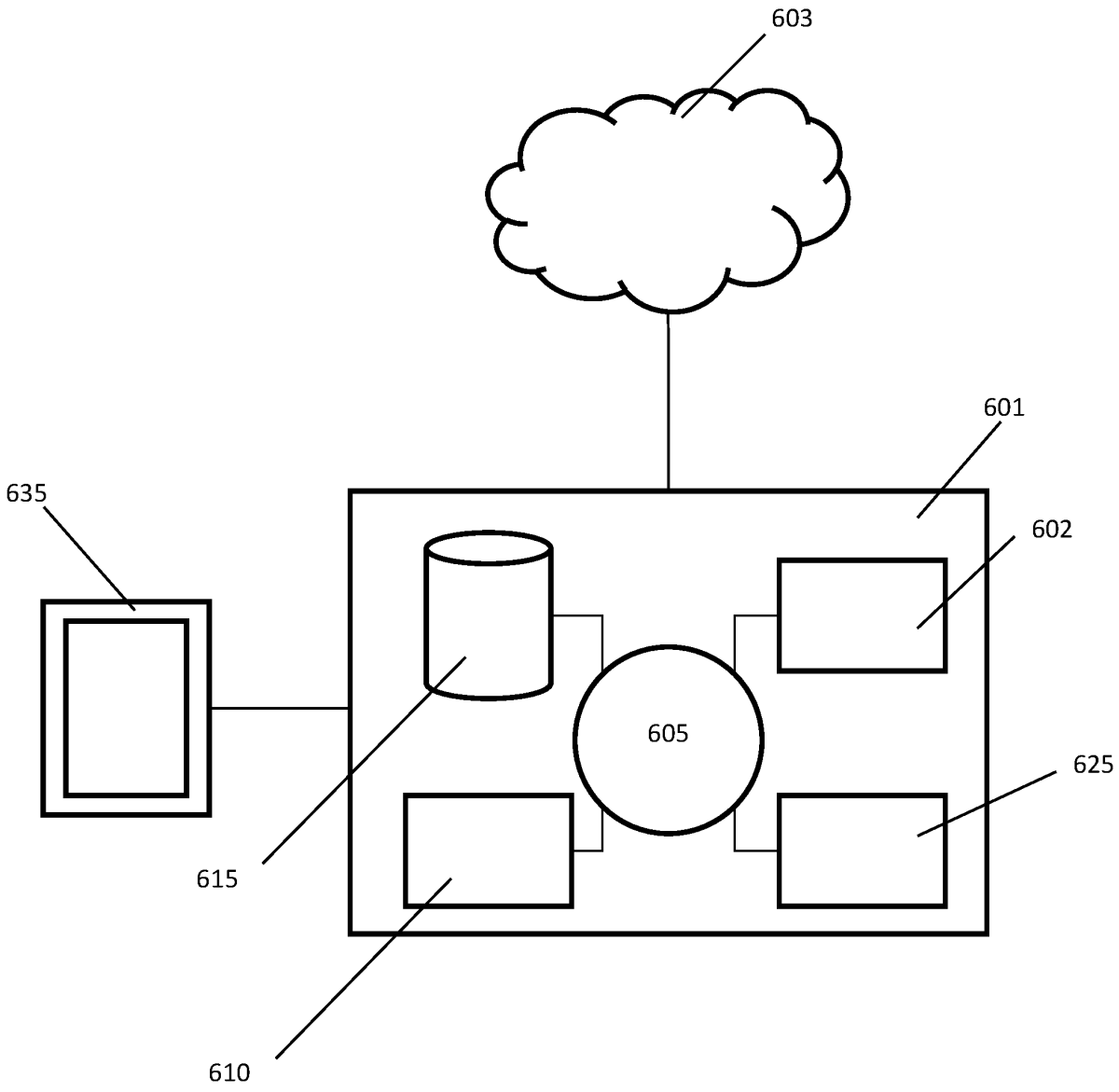

FIG. 6

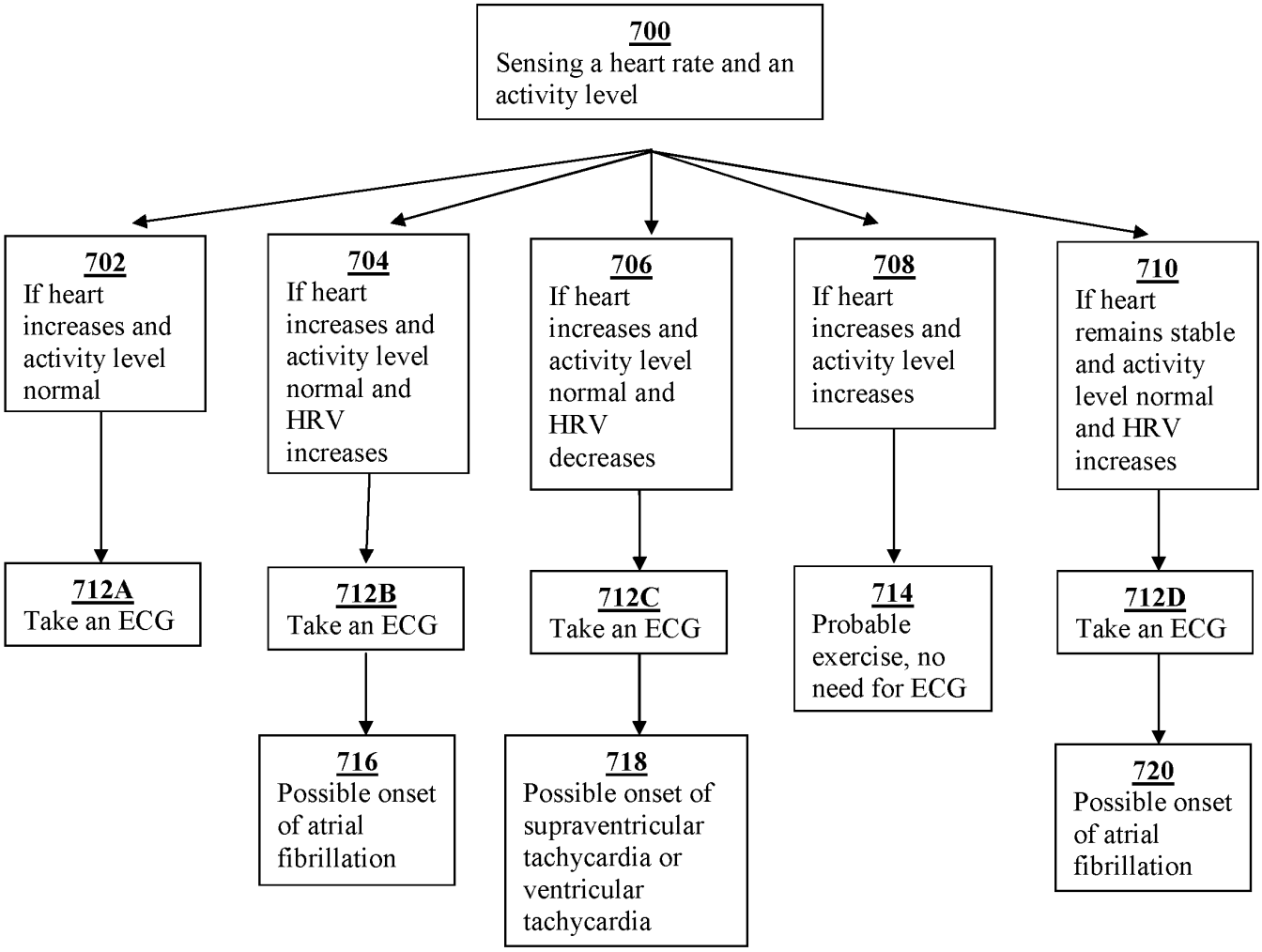
700
Sensing a heart rate and an activity level
702
If heart increases and activity level normal
704
If heart increases and activity level normal and HRV increases
706
If heart increases and activity level normal and HRV decreases
708
If heart increases and activity level increases
710
If heart remains stable and activity level normal and HRV increases
712A
Take an ECG
712B
Take an ECG
712C
Take an ECG
714
Probable exercise, no need for ECG
712D
Take an ECG
716
Possible onset of atrial fibrillation
718
Possible onset of supraventricular tachycardia or ventricular tachycardia
720
Possible onset of atrial fibrillation

FIG. 7

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A102992 1200US.C2
	Application Number	
Title of Invention	DISCORDANCE MONITORING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David	E.	Albert	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Oklahoma City	OK	US

Mailing Address of Inventor:

Address 1	444 Castro St., Suite 600
Address 2	

City	State/Province	Postal Code	Country
Mountain View	CA	94041	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	151512		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	DISCORDANCE MONITORING		
Attorney Docket Number	A102992 1200US.C2	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

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Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	151512		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15656745	2017-07-21

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A102992 1200US.C2
	Application Number	
Title of Invention	DISCORDANCE MONITORING	

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15656745	Continuation of	15154849	2016-05-13	9839363	2017-12-12
Prior Application Status	Expired				Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
15154849	Claims benefit of provisional	62161092	2015-05-13		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.					Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.			Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A102992 1200US.C2
	Application Number	
Title of Invention	DISCORDANCE MONITORING	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A102992 1200US.C2
	Application Number	
Title of Invention	DISCORDANCE MONITORING	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	AliveCor, Inc.		
Mailing Address Information For Applicant:			
Address 1	444 Castro St., Suite 600		
Address 2			
City	Mountain View	**State/Province**	US
Country	US	Postal Code	94041
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A102992 1200US.C2
	Application Number	
Title of Invention	DISCORDANCE MONITORING	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Chris E. Kokoska/			Date (YYYY-MM-DD)	2018-10-11
First Name	Christopher E.	Last Name	Kokoska, Esq.	Registration Number	73,719

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	A102992 1200US.C2
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Title of Invention	DISCORDANCE MONITORING	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

DISCORDANCE MONITORING

CROSS-REFERENCE

[0001] This application is a continuation of U.S. Patent Application No. 15/656,745, filed July 21, 2017, entitled "DISCORDANCE MONITORING", which is a continuation of U.S. Patent Application No. 15/154,849, filed May 13, 2016, entitled "DISCORDANCE MONITORING", now issued as U.S. Patent No. 9,839,363 on December 12, 2017, which claims the benefit of U.S. Provisional Application No. 62/161,092, filed May 13, 2015, both of which are incorporated herein by reference in its entirety.

BACKGROUND

[0002] Irregular heartbeats and arrhythmias are associated with significant morbidity and mortality in patients. Arrhythmias may occur continuously or may occur intermittently. Types of arrhythmia include atrial fibrillation and supraventricular tachycardia. Non-invasive cardiac monitoring is useful in diagnosing cardiac arrhythmia.

SUMMARY

[0003] Described herein are systems, devices, and methods for cardiac monitoring. The systems, devices, and methods described herein for cardiac monitoring may comprise portable computing devices such as smartphones, smartwatches, laptops, and tablet computers. Cardiac monitoring using the systems, devices, and methods described herein may be used to predict or identify the occurrence of arrhythmias.

[0004] Arrhythmias may occur continuously or may occur intermittently. Continuously occurring arrhythmias may be diagnosed using a number of different techniques including, for example, palpating a radial pulse of an individual, auscultating heart sounds of an individual, recording a heart rate of an individual, and recording an electrocardiogram of an individual. Because a continuous or essentially continuous arrhythmia is always present or essentially always present in the patient, any of the aforementioned diagnosis techniques may be applied at any time in order to make a diagnosis.

For intermittent arrhythmia diagnosis any of the aforementioned diagnosis techniques may also be used, however, because intermittent arrhythmias do not always present, the diagnostic technique cannot be applied at any time, but must be applied at the time when the individual is experiencing the arrhythmia. Thus, diagnosing, intermittent arrhythmias may be difficult, because, for example, it is not practical to be prepared to apply one of the aforementioned diagnostic modalities at the exact time that an individual experiences an intermittent arrhythmia. This particular difficulty may also be compounded when an individual is not aware that they are experiencing an intermittent arrhythmia so that they would not, for example, seek out a health care provider during the intermittent arrhythmia.

[0005] However, certain parameter values may be conveniently sensed continuously such as, for example, heart rate and activity level, and analyzed to predict or determine the presence of an arrhythmia. One or more conveniently continuously sensed parameter values such as, for example, heart rate and activity level may be analyzed to determine the future onset of or the presence of an arrhythmia by identifying discordance between these two parameter values. For example, discordance between two sensed values may indicate the future onset of or the presence of an arrhythmia. In response to the identification of the future onset of or presence of an arrhythmia an electrocardiogram may be caused to be sensed.

[0006] Additional sensed parameters may also be used in an analysis as part of the cardiac monitoring systems, devices, and methods described herein. For example, a determined heart rate variability may be compared to a sensed heart rate and activity level to determine the presence of, for example, atrial fibrillation or supraventricular tachycardia.

[0007] Described herein is a method for cardiac monitoring, comprising: sensing an activity level value of an individual with a first sensor of a wearable device worn by said individual; sensing a heart rate value of said individual with a second sensor of said wearable device; determining a heart rate variability value with a processor of said wearable device; determining if a discordance is

present between two or more of said activity level value, said heart rate value, and said heart rate variability value with said processor; and indicating to said individual with said wearable device to record an electrocardiogram when said discordance is determined to be present. In some embodiments, said first sensor comprises an accelerometer. In some embodiments, said first sensor comprises a gyroscope. In some embodiments, said second sensor comprises a photosensor. In some embodiments, said discordance is determined to be present when said activity level value is normal and said heart rate value is elevated. In some embodiments, said discordance is determined to be present when said activity level value is normal, said heart rate value is elevated, and said heart rate variability value is increased. In some embodiments, said method comprises indicating a presence of atrial fibrillation. In some embodiments, said discordance is determined to be present when said activity level value is normal, said heart rate value is elevated, and said heart rate variability value is decreased. In some embodiments, said method comprises indicating a presence of a supraventricular tachycardia. In some embodiments, setting one or more threshold values based on said activity level value, said heart rate value, and said heart rate variability value. In some embodiments, said one or more threshold values is determined using a machine learning algorithm.

[0008] Described herein is wearable device for cardiac monitoring, comprising: a processor; a first sensor configured to sense an activity level value of an individual, wherein said first sensor is coupled to said processor; a second sensor configured to sense a heart rate value of an individual, wherein said second sensor is coupled to said processor; a first electrode and a second electrode configured to sense an electrocardiogram; a non-transitory computer readable storage medium encoded with a computer program including instructions executable by said processor to cause said processor to: determine if a discordance is present between said activity level value of said individual and said heart rate value of said individual; and indicate that said electrocardiogram be recorded when said discordance is determined to be present. In some embodiments, said first sensor comprises an accelerometer. In some embodiments, said first sensor comprises a gyroscope. In

some embodiments, said second sensor comprises a photosensor. In some embodiments, said discordance is determined to be present when said activity level value is normal and said heart rate value is elevated. In some embodiments, said computer program includes instructions that cause said processor to determine a heart rate variability value. In some embodiments, said discordance is determined to be present when said activity level value is normal, said heart rate value is elevated, and said heart rate variability value is increased. In some embodiments, said computer program includes instructions that cause said processor to indicate a presence of atrial fibrillation. In some embodiments, said discordance is determined to be present when said activity level value is normal, said heart rate value is elevated, and said heart rate variability value is elevated. In some embodiments, said computer program includes instructions that cause said processor to indicate a presence of a supraventricular tachycardia. In some embodiments, said computer program includes instructions that cause said processor to set one or more threshold values based on said activity level value, and said heart rate value.

[0009] In some embodiments, said one or more threshold values is determined using a machine learning algorithm.

[0010] Described herein is a method for cardiac monitoring, comprising: sensing an activity level value of an individual with a first sensor of a wearable device worn by said individual; sensing a heart rate value of said individual with a second sensor of said wearable device; determining if a discordance is present between two or more of said activity level value and said heart rate value by using an activity level threshold and a heart rate threshold with a processor of said wearable device; and adjusting said activity level threshold and said heart rate level threshold using a machine learning algorithm executed by said processor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The novel features of the individual matter described herein are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present individual matter described herein will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the individual matter described herein are utilized, and the accompanying drawings of which:

[0012] FIG. 1 shows a heart rate tracing with a corresponding electrocardiogram (ECG) tracing both sensed from the same individual over the same period.

[0013] FIG. 2 shows a graphic showing both heart rate and rhythm analysis over a period of time in an individual who experienced different arrhythmias.

[0014] FIG. 3 shows a close up of a heart rate tracing sensed over a period of paroxysmal atrial fibrillation.

[0015] FIG. 4 shows available technologies for continuously sensing a heart rate or an activity level.

[0016] FIG. 5 shows a photosensor commonly used to measure heart rates integrated with a smartwatch.

[0017] FIG. 6 exemplifies a computer system that is programmed or otherwise configured to sense one or more physiologic parameters of an individual.

[0018] Fig. 7 shows a schematic of an algorithm for discordance monitoring.

DETAILED DESCRIPTION

[0019] Cardiac Monitoring

[0020] Described herein are systems, devices, and methods for use in cardiac monitoring. Cardiac monitoring typically comprises monitoring of the heart function of an individual for changes in, for example, heart rate or heart rhythm.

[0021] Heart rate may vary between, for example, bradycardia which typically is defined as a heart rate of less than 60 beats per minute, normal resting heart rate which typically is defined as a heart rate of between 60-100 beats per minute, and tachycardia which typically is defined as a heart rate of greater than 100 beats per minute. Variance of heart rate over a period of time may be referred to as Heart Rate Variability (HRV).

[0022] Heart function is also measured in terms of regularity of rhythm. A normal heart rhythm comprises of a systole (ejection phase) and diastole (filling phase). During the phases of systole and diastole, the ventricles of the heart act in concert in a regular manner that is repeated with every single heartbeat. When there is an abnormality of rhythm, the condition is typically referred to as an arrhythmia. Examples of arrhythmias include atrial fibrillation, WPW syndrome, prolonged QT syndrome, and premature ventricular contractions.

[0023] Many arrhythmias occur intermittently and relatively infrequently. Thus, in order to monitor and capture an intermittent arrhythmia, continuous monitoring is typically required. ECGs can be measured continuously in the ambulatory patient using holter monitoring, but this type of monitoring is cumbersome for the patient and is thus not widely used. A device or system configured to take an intermittent ECG is much more convenient for users. Such devices or systems comprise a mobile computing device that includes one or more electrodes that sense an ECG when contacted by a skin surface of the patient. Such devices are light and portable and don't necessarily require the user to be in continuous physical contact with one or more electrodes as they would with a holter type monitor. Intermittent arrhythmias can be recorded with these devices and systems when a user is given an indication that an intermittent arrhythmia is occurring. HRV sensing is used in combination with these devices or systems to indicate to a user when to contact one or more electrodes in order to sense an ECG.

[0024] FIG. 1 shows a heart rate tracing 100 with a corresponding electrocardiogram (ECG) tracing 104 both sensed from the same individual over the same period. As is shown in the ECG tracing

104, the individual experienced a period of intermittent atrial fibrillation 106 during the time that the ECG was sensed. As is also shown in the heart rate tracing 100, the heart rate of the individual rapidly increased 102 during the period of intermittent atrial fibrillation. As such, the HRV of the individual increased during the period of intermittent atrial fibrillation as the heart rate of the individual increased from a resting heart rate to an increased heart rate 102. HRV changes are therefore associated with atrial fibrillation, wherein increased HRV is found during periods of intermittent atrial fibrillation.

[0025] FIG. 2 shows a graphic showing both heart rate 202 and rhythm analysis 200 over a period of time in an individual who experienced different arrhythmias. As shown, the measured heart rate 202 tended to increase above 100 beats per minute during the periods of sensed atrial fibrillation 200. Thus, elevated heart rate above resting heart rate occurred in this individual during the period of arrhythmia.

[0026] FIG. 3 shows a close up of a heart rate tracing sensed over a period of paroxysmal atrial fibrillation. As shown, there was a substantial step increase from a normal heart of between 60 – 100 beats per minute to above 100 beats per minute 302 during the period of atrial fibrillation.

[0027] FIG. 4 shows available technologies 400 for continuously sensing a heart rate or an activity level. Shown are smartwatches made available by manufactures such as, for example, Apple. A wearer of one of the shown smartwatch technologies 400 may conveniently and continuously wear one or more sensors that are either coupled to or integrated with the watch throughout the day, thus, effectively continuously monitoring one or more parameter values via the one or more sensors that are either coupled to or integrated with the smartwatch. Thus, one of the smartwatch technologies 400 are an example of a type of device in the form of a wearable that conveniently provides continuous monitoring of one or more parameters of a user. Non-limiting examples of wearable devices that may have one or more sensors either coupled to them or integrated with them include watches (e.g. smartwatches), eyeglasses, wristbands, necklaces, and clothing. The one or more

continuously sensed parameters of the user of such a technology as, for example, shown in FIG. 4, are then used to indicate to the user to use a device or system to sense an ECG. For example, a user wearing a smartwatch having a heart rate sensor is alerted by the smartwatch to record an ECG when the HRV of the user increases.

[0028] FIG. 5 shows a photosensor 500 commonly used to measure heart rates integrated with a smartwatch 502.

[0029] Activity level is correlated with arrhythmia in many individuals who have a predisposition to develop arrhythmia wherein increased activity level is associated with onset of arrhythmia. In other individuals an increased activity level that is detected by one or more activity sensors in the presence of increased HRV is likely normal and is not associated with arrhythmia. Thus, as described herein, the addition of continuous heart rate monitoring along with continuous activity level monitoring may achieve the same results, in terms of arrhythmia monitoring, as continuous electrocardiogram monitoring. Using one or more sensors associated with the devices or systems described herein two parameter values of heart rate and activity level may be conveniently and accurately continuously and simultaneously sensed.

[0030] Devices and Systems

[0031] FIG. 6 exemplifies a computer system 601 that is programmed or otherwise configured to sense one or more physiologic parameters of an individual. Non-limiting examples of physiologic parameters include heart rate, blood pressure, temperature, oxygen saturation, ECG, HRV, and activity level. The computer system 601 comprises an electronic device of a user 635, or comprises a computer system that is remotely located with respect to the electronic device 635. Electronic devices suitable for use with the system 601 include mobile electronic devices such as smartphones, smartwatches, tablets, and laptops. The electronic device 601 comprises one or more sensors configured to sense a physiologic parameter. Numerous sensors are known for measuring heart rate. Non-limiting examples of suitable sensors include light based sensors such as, for example, infrared

sensor/emitter, ultrasound sensors, and tactile sensors. Sensors for measuring rhythm include electrodes for measuring electrocardiograms (ECG) and light based sensors for measuring photoplethysmograms.

[0032] The computer system 601 includes a central processing unit (CPU, also "processor" and "computer processor" herein) 605, which can be a single core or multi core processor, or a plurality of processors for parallel processing. The computer system 601 also includes memory or memory location 610 (e.g., random-access memory, read-only memory, flash memory), electronic storage unit 615 (e.g., hard disk), communication interface 602 (e.g., network adapter) for communicating with one or more other systems, and peripheral devices 625, such as cache, other memory, data storage and/or electronic display adapters. The memory 610, storage unit 615, interface 602 and peripheral devices 625 are in communication with the CPU 605 through a communication bus (solid lines), such as a motherboard. The storage unit 615 can be a data storage unit (or data repository) for storing data. The computer system 601 can be operatively coupled to a computer network ("network") 603 with the aid of the communication interface 602. The network 603 can be the Internet, an internet and/or extranet, or an intranet and/or extranet that is in communication with the Internet. The network 603 in some cases is a telecommunication and/or data network. The network 603 can include one or more computer servers, which can enable distributed computing, such as cloud computing. The network 603, in some cases with the aid of the computer system 601, can implement a peer-to-peer network, which may enable devices coupled to the computer system 601 to behave as a client or a server.

[0033] The CPU 605 can execute a sequence of machine-readable instructions, which can be embodied in a program or software. The instructions may be stored in a memory location, such as the memory 610. The instructions can be directed to the CPU 605, which can subsequently program or otherwise configure the CPU 605 to implement methods of the present disclosure. Examples of operations performed by the CPU 605 can include fetch, decode, execute, and writeback.

[0034] The CPU 605 can be part of a circuit, such as an integrated circuit. One or more other components of the system 601 can be included in the circuit. In some cases, the circuit is an application specific integrated circuit (ASIC).

[0035] The storage unit 615 can store files, such as drivers, libraries and saved programs. The storage unit 615 can store user data, e.g., user preferences and user programs. The computer system 601 in some cases can include one or more additional data storage units that are external to the computer system 601, such as located on a remote server that is in communication with the computer system 601 through an intranet or the Internet.

[0036] The computer system 601 can communicate with one or more remote computer systems through the network 603. For instance, the computer system 601 can communicate with a remote computer system of a user (e.g., mobile device, server, etc.). Examples of remote computer systems include personal computers (e.g., portable PC), slate or tablet PC's (e.g., Apple® iPad, Samsung® Galaxy Tab), telephones, Smart phones (e.g., Apple® iPhone, Android-enabled device, Blackberry®), or personal digital assistants. The user can access the computer system 601 via the network 603.

[0037] Methods as described herein can be implemented by way of machine (e.g., computer processor) executable code stored on an electronic storage location of the computer system 601, such as, for example, on the memory 610 or electronic storage unit 615. The machine executable or machine readable code can be provided in the form of software. During use, the code can be executed by the processor 605. In some cases, the code can be retrieved from the storage unit 615 and stored on the memory 610 for ready access by the processor 605. In some situations, the electronic storage unit 615 can be precluded, and machine-executable instructions are stored on memory 610.

[0038] The code can be pre-compiled and configured for use with a machine have a processer adapted to execute the code, or can be compiled during runtime. The code can be supplied in a

programming language that can be selected to enable the code to execute in a pre-compiled or as-compiled fashion.

[0039] Aspects of the systems and methods provided herein, such as the computer system 601, can be embodied in programming. Various aspects of the technology may be thought of as "products" or "articles of manufacture" typically in the form of machine (or processor) executable code and/or associated data that is carried on or embodied in a type of machine readable medium. Machine-executable code can be stored on an electronic storage unit, such memory (e.g., read-only memory, random-access memory, flash memory) or a hard disk. "Storage" type media can include any or all of the tangible memory of the computers, processors or the like, or associated modules thereof, such as various semiconductor memories, tape drives, disk drives and the like, which may provide non-transitory storage at any time for the software programming. All or portions of the software may at times be communicated through the Internet or various other telecommunication networks. Such communications, for example, may enable loading of the software from one computer or processor into another, for example, from a management server or host computer into the computer platform of an application server. Thus, another type of media that may bear the software elements includes optical, electrical and electromagnetic waves, such as used across physical interfaces between local devices, through wired and optical landline networks and over various air-links. The physical elements that carry such waves, such as wired or wireless links, optical links or the like, also may be considered as media bearing the software. As used herein, unless restricted to non-transitory, tangible "storage" media, terms such as computer or machine "readable medium" refer to any medium that participates in providing instructions to a processor for execution.

[0040] Hence, a machine readable medium, such as computer-executable code, may take many forms, including but not limited to, a tangible storage medium, a carrier wave medium or physical transmission medium. Non-volatile storage media include, for example, optical or magnetic disks, such as any of the storage devices in any computer(s) or the like, such as may be used to implement

the databases, etc. shown in the drawings. Volatile storage media include dynamic memory, such as main memory of such a computer platform. Tangible transmission media include coaxial cables; copper wire and fiber optics, including the wires that comprise a bus within a computer system. Carrier-wave transmission media may take the form of electric or electromagnetic signals, or acoustic or light waves such as those generated during radio frequency (RF) and infrared (IR) data communications. Common forms of computer-readable media therefore include for example: a floppy disk, a flexible disk, hard disk, magnetic tape, any other magnetic medium, a CD-ROM, DVD or DVD-ROM, any other optical medium, punch cards paper tape, any other physical storage medium with patterns of holes, a RAM, a ROM, a PROM and EPROM, a FLASH-EPROM, any other memory chip or cartridge, a carrier wave transporting data or instructions, cables or links transporting such a carrier wave, or any other medium from which a computer may read programming code and/or data. Many of these forms of computer readable media may be involved in carrying one or more sequences of one or more instructions to a processor for execution

[0041] The computer system 601 can include or be in communication with an electronic display 535 that comprises a user interface (UI) 640 for providing, for example, distributions of magnetic fields, distributions of electrical currents, distributions of local myocardial activities, etc. Examples of UI's include, without limitation, a graphical user interface (GUI) and web-based user interface.

[0042] Methods and systems of the present disclosure can be implemented by way of one or more algorithms. An algorithm can be implemented by way of software upon execution by the central processing unit 605. The algorithm, for example, is used to analyze a sensed physiologic parameter.

[0043] A device as described herein is in some embodiments configured to sense two or more physiologic parameters. For example, a device configured to measure the heart rate of an individual as described herein is also in some embodiments configured to sense the electrocardiogram of said individual. In these embodiments, a device as described herein includes one or more electrodes configured to sense an electrocardiogram of an individual. In some embodiments, a device as

described herein comprises two electrodes. In some embodiments, a device as described herein comprises three electrodes. In some embodiments, a device as described herein comprises four electrodes. In some embodiments, a device as described herein comprises five electrodes. In some embodiments, a device as described herein comprises six electrodes. In some embodiments, a device as described herein comprises seven electrodes. In some embodiments, a device as described herein comprises eight electrodes. In some embodiments, a device as described herein comprises nine electrodes. In some embodiments, a device as described herein comprises ten electrodes. Electrodes of the device described herein are configured to sense an electrocardiogram of an individual and transmit the sensed electrocardiogram data to a processor integrated with the device or part of the system described herein. In some embodiments, the processor is configured to display the electrocardiogram on a display of the device described herein. In some embodiments, the device is configured to sense and/or display a single lead electrocardiogram. In some embodiments, the single lead comprises any of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display two leads comprising any two of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display two leads comprising any three of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display three leads comprising any three of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display four leads comprising any four of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display five leads comprising any five of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device or

system is configured to sense and/or display six leads comprising any six of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display seven leads comprising any seven of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display eight leads comprising any eight of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display nine leads comprising any nine of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display ten leads comprising any ten of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display eleven leads comprising any eleven of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device is configured to sense and/or display twelve leads comprising any twelve of Lead I, Lead II, Lead aVR, Lead aVL, Lead aVF, Lead V1, Lead V2, Lead V3, Lead V4, Lead V5, and Lead V6. In some embodiments, the device includes software configured to cause a processor of said device to analyze the sensed electrocardiogram. An analysis of a sensed electrocardiogram performed by the processor of the device identifies the presence of an abnormal heart condition. For example, an analysis performed by a processor of a device, in some embodiments, identifies arrhythmias by, for example, analysis of the PQRST waveform and/or comparing multiple PQRST waveforms within an electrocardiogram. In some embodiments, the processor carries out an analysis of an electrocardiogram by comparing one or more PQRST waveforms of an individual against a one or more PQRST waveforms of other individuals from a database containing electrocardiograms of other individuals. In some embodiments of the devices described herein, an individual is alerted to sense an electrocardiogram by, for example, engaging

one or more electrodes when the device senses one or more physiologic parameters. For example, in some embodiments, a device as described herein is configured to sense a blood pressure of an individual, and in some of these embodiments, the device is configured to sense a second physiologic parameter of the individual such as for example a heart rate. An accelerated heart rate of an individual sensed by the device in addition to, for example, a low blood pressure of the individual concurrently sensed by the device, triggers the processor of the device to indicate to the individual to engage with the electrodes of the device in order to sense an electrocardiogram.

[0044] The combination of a sensed accelerated heart rate and low blood pressure typically indicate an abnormality, however, other physiologic conditions may also produce an elevated heart rate accompanied by low blood pressure including, for example, dehydration. Thus, in some embodiments, accuracy is enhanced when physiologic parameters such as, for example, heart rate, blood pressure, oxygen saturation, and temperature are compared to baseline values of the individual or to a data from a database containing the physiological parameters of other individuals. Some elite athletes, for example, have physiologic parameter values that would be abnormal in another individual such as, for example, very low heart rates or increased heart rate variability (e.g. during a period of exercise).

[0045] A device as described herein is in some embodiments configured to sense a photophletysmogram of an individual. A photopletysmogram, for example, provides cardiac cycle information and may, for example, be analyzed by a processor of a device described herein to determine a presence of a premature ventricular contraction.

[0046] In some embodiments, a device as described herein is configured to sense a pulse oxygenation of an individual. A device as described herein is configured to sense a pulse oxygenation of an individual in some embodiments.

[0047] Analysis

[0048] In some embodiments, a device as described herein is configured to sense and/or analyze a number of additional physiologic parameters. Non-limiting examples of parameter values sensed and/or analyzed by the devices and systems described herein include heart rate, activity level, blood pressure, temperature, pulse oxygen, and heart rate variability. Analysis includes in some embodiments the comparison of a first sensed physiologic parameter to a second sensed physiologic and determining if a discordance exists between the first and second sensed parameter values.

[0049] In some embodiments, a device as described herein is configured to monitor for arrhythmia in an individual, wherein monitoring may comprise the identification of onset of an arrhythmia. In some embodiments, cardiac monitoring carried out by the devices described herein comprises, for example, monitoring for the presence or onset of arrhythmia in an individual who has not previously been identified to have an arrhythmia. In some embodiments, cardiac monitoring carried out by the devices described herein comprises the identification of onset of a known or suspected intermittent arrhythmia. In some embodiments, the devices described herein are configured to predict an onset of an arrhythmia in an individual. The onset of an arrhythmia is, for example, predicted due to a sudden and significant shift in the value of a sensed physiologic parameter such as heart rate. A prediction of arrhythmia is more accurate when two or more physiologic parameters are concurrently sensed and analyzed with respect to one another. For example, sensing of heart rate changes with respect to a sensed activity level provides contextual information for the sensed heart rate.

[0050] A subset of arrhythmias are sometimes termed tachyarrhythmias. Tachyarrhythmias typically comprise a tachycardic heart rate which may comprise a heart rate above 100 beats per minute. Tachyarrhythmias may comprise, for example, certain types of atrial fibrillation and supraventricular tachycardia. In some embodiments, the devices as described herein are configured to identify the presence or onset of a tachyarrhythmia, such as, for example, atrial fibrillation or supraventricular tachycardia. In some embodiments, the devices as described herein are configured

to identify the presence or onset of a tachyarrhythmia. In some embodiments, the devices as described herein are configured to predict the onset of a tachyarrhythmia.

[0051] In some embodiments, the devices as described herein are configured to provide continuous cardiac monitoring. In some embodiments, the devices as described herein are configured to provide continuous cardiac monitoring for a period of up to one year. In some embodiments, the devices as described herein are configured to provide continuous cardiac monitoring for a period of up to 12 months. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 6 months. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 3 months. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 1 month. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 2 weeks. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 1 weak. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 72 hours. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 48 hours. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 24 hours. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 12 hours. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 8 hours. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 4 hours. In some embodiments, the devices described herein are configured to provide continuous cardiac monitoring for a period of up to 2 months.

[0052] In some embodiments, the devices described herein are configured to provide intermittent cardiac monitoring. In some embodiments, intermittent cardiac monitoring is initiated in response to one or more sensed parameter values. Non-limiting examples of the one or more sensed parameter value that may cause initiation of intermittent cardiac monitoring may comprise, for example, a heart rate of an individual, a blood pressure of an individual, an activity level an individual, a temperature of an individual, a pulse oximetry of an individual, or any other sensed biometric parameter of an individual. In some embodiments, an electrocardiogram of an individual may be sensed in response to one or more sensed parameters. For example, an electrocardiogram may be caused to be sensed in response to a heart rate value.

[0053] In some embodiments, one or more continuous sensors may sense one or more parameters that cause the initiation of intermittent cardiac monitoring by one or more sensors. In some embodiments, a heart rate of an individual is sensed continuously. In some embodiments, an activity level of an individual is sensed continuously. In some embodiments, a heart rate variability of an individual is sensed continuously. In some embodiments, an electrocardiogram of an individual is sensed intermittently. In some embodiments, an intermittently sensed electrocardiogram is caused to be sensed in response to a continuously measured heart rate of an individual. In some embodiments, an intermittently sensed electrocardiogram is caused to be sensed in response to an activity level of an individual. In some embodiments, an intermittently sensed electrocardiogram is caused to be sensed in response to both a continuously measured heart rate and a continuously measured activity level. In some embodiments, an intermittently sensed electrocardiogram is caused to be sensed in response to a continuously sensed heart rate, a continuously sensed activity level, and a continuously sensed heart rate variability.

[0054] In some embodiments, a device or system as described herein comprises one or more sensors configured for continuous cardiac monitoring. In some embodiments, a device or system as described herein comprises one or more sensors configured for intermittent cardiac monitoring. In

some embodiments, a device or system as described herein comprises one or more heart rate sensors, which may, for example, comprise a photosensor. In some embodiments, a device or system as described herein comprises one or more activity level sensors, which may, for example, comprise an accelerometer or a gyroscope. In some embodiments, a device or system as described herein comprises one or more electrocardiogram sensors, which may, for example, comprise one or more electrodes. Non-limiting examples of other sensors suitable for use with the devices, systems, and methods described herein further comprise blood pressure sensors, temperature sensors, and pulse oximetry sensors.

[0055] In some embodiments, a device or system as described herein comprises a processor. In some embodiments, a process is coupled with one or more sensors that are configured to sense continuously and one or more sensors that are configured to sense intermittently. In some embodiments, a processor is configured to receive parameter values from one or more sensors. In some embodiments, a processor is configured to activate one or more sensors or to initiate the sensing of a parameter value. In some embodiments, a processor is configured to analyze a parameter value. In some embodiments, a processor is configured to compare a first parameter value with a second parameter value. In some embodiments, a first and a second parameter value to be compared are simultaneously or essentially simultaneously sensed.

[0056] In some embodiments, a device or system as described herein further comprises software in the form of a program or application. In some embodiments, the program or application may be configured to cause a processor to carry out one or more functions. In some embodiments, the program or application may be configured to cause a processor to receive parameter values from one or more sensors. In some embodiments, the program or application may be configured to cause a processor to activate one or more sensors or to initiate the sensing of a parameter value. In some embodiments, the program or application may be configured to cause a processor to analyze a parameter value. In some embodiments, the program or application may be configured to cause a

processor to compare a first parameter value with a second parameter value. In some embodiments, a first and a second parameter value to be compared are simultaneously or essentially simultaneously sensed.

[0057] In some embodiments, the devices described herein are configured to carry out an analysis, wherein the analysis is performed by a processor. In some embodiments, an analysis of one or more parameter values carried out by the devices described herein comprises a comparison of a sensed parameter value to a threshold or range. For example, an analysis may comprise determining whether a sensed heart rate value falls within one or more ranges. For example, in some embodiments, a sensed heart rate may be determined to be within a heart rate range comprising a range between 60 – 100 beats per minute. For example, in some embodiments, a sensed heart rate may be determined to be in a heart rate range comprising a range of values less than 60 beats per minute. For example, in some embodiments, a sensed heart rate may be determined to be within a heart rate range comprising a range of values above 100 beats for minute.

[0058] In some embodiments, an analysis of one or more parameter values carried out by the devices described herein comprises a comparison of a first sensed parameter to a second sensed parameter. For example, in some embodiments, a heart rate value is compared to a sensed activity level of an individual.

[0059] In some embodiments, a first sensed value is compared to a second sensed value, and it is determine whether a discordance exists between the two values. For example, in some embodiments, an elevated heart rate value would be expected to be present during a period of elevated activity, thus an elevated heart rate and an elevated activity level that are simultaneously sensed would not be found to be in discordance with one another.

[0060] A discordance may be identified when a first sensed parameter value would not be expected to coincide with a second sensed parameter value. For example, an elevated heart rate value would not be expected to be present with a normal or resting activity level and thus the two values are in

discordance with one another. For example, in some embodiments, when a heart rate sensor senses a heart rate above 100 beats per minute and a simultaneously sensed activity level is determined to be a resting activity level, an analysis of the two sensed values determines that they are in discordance with one another.

[0061] In some embodiments, an analysis carried out by the devices and systems described herein comprises the determination of an increase in a heart rate variability. In some embodiments, an analysis carried out by the devices and systems described herein comprises comparing a heart rate variability with one or more sensed parameter values. For example, in some embodiments, a heart rate variability is compared to concurrently or essentially concurrently sensed heart rate and activity level values.

[0062] In some embodiments, an analysis carried out by the devices and systems described herein comprises the prediction of or the identification of the initiation of an arrhythmia using an identified discordance as described herein. In some embodiments, a discordance comprising a simultaneously or essentially simultaneously sensed elevated heart rate and resting or normal activity level is determined to indicate the imminent initiation of an arrhythmia or the presence of an arrhythmia. In particular, because the heart rate is elevated, the arrhythmia with this type of discordance typically comprises a tachyarrhythmia.

[0063] In some embodiments, a simultaneously sensed increase in heart rate variability, an elevated heart rate, and a resting or normal activity rate is determined to indicate the future onset or presence of atrial fibrillation. In some embodiments, a sensed increased heart rate variability, normal resting heart rate, and resting or normal activity rate may also be determined to indicate the future onset of or the presence of atrial fibrillation. In some embodiments, a simultaneously sensed decrease in heart rate variability, an elevated heart rate, and a resting or normal activity rate is determined to indicate the future onset or presence of supraventricular tachycardia. In some embodiments, when an arrhythmia is determined to be imminent or present, an electrocardiogram is recorded. In some

embodiments, an individual is instructed or signaled by a cardiac monitoring device or system described herein to engage one or more electrodes in order to sense in electrocardiogram. In some embodiments, one or more electrodes may be positioned on a surface of a cardiac monitoring device so that the individual may, for example, comfortably engage a first electrode with a skin surface of a first extremity while simultaneously engaging a second electrode with a skin surface of a second extremity. In some embodiments, one or more electrodes may be affixed to an individual's body and are automatically engaged to sense an electrocardiogram by a cardiac monitoring device or system when an arrhythmia is determined to be imminent or present in the individual. For example, a first electrode may be positioned on smartwatch worn by the individual on a first extremity and a second electrode may be positioned on a wristlet worn by the individual on a second extremity. In this example, the first electrode on the smartwatch and the second electrode on the wristlet are both in communication with and controlled by the cardiac monitoring device.

[0064] In some embodiments, the devices described herein are configured to carry out machine learning. In some embodiments, the devices, systems, and methods described herein comprise machine learning algorithms which analyze parameter values sensed from an individual over period of time. In some embodiments, the devices, systems, and methods described herein comprise machine learning algorithms which analyze parameter values sensed from a plurality of individuals. In some embodiments, a machine learning algorithm causes the devices, systems, and methods described herein to more accurately identify or predict the presence of an arrhythmia in a given individual. For example, in some embodiments, sensed electrocardiogram data may be compared back to parameter values such as, for example, sensed heart rates and activity levels that triggered the sensing of said electrocardiograms. When, for example, sensed electrocardiograms confirm the presence of an arrhythmia, the presence of which was indicated by, for example, a discordance between other parameter values, the machine algorithm causes the device or system described herein to learn from that data. Similarly, when, for example, sensed electrocardiograms do not confirm the

presence of an arrhythmia, the presence of which was indicated by, for example, a discordance between other parameter values, the machine algorithm causes the device or system described herein to learn from that data as well. That is, in some embodiments, the machine learning algorithm correlates the sensed electrocardiogram with the discordance between parameter values that caused it (i.e. the electrocardiogram) to be sensed. The presence or absence of an arrhythmia on the electrocardiogram either respectively reinforces the correlation of an arrhythmia with the discordance that caused the electrocardiogram to be sensed or contradicts the presence of a correlation of an arrhythmia with the discordance. For example, when a heart rate of 110 is sensed and simultaneously a resting activity is sensed, an electrocardiogram is caused to be sensed, and when the sensed electrocardiogram does not indicate a presence of an arrhythmia the machine learning algorithm causes the device or system as described herein to learn that for that individual a heart rate of 110 at rest does not necessarily indicate a presence of an arrhythmia. In some embodiments, the machine learning algorithm continues to cause the storing of parameter value data, such as, for example, heart rate, activity level, and heart rate variability, and compare the parameter values to the associated electrocardiogram data over time. Thus, in some embodiments, with multiple parameter values sensed over time and compared to associated electrocardiogram data, a cardiac monitoring device or system improves its ability to predict or identify the onset of arrhythmia based on a discordance between parameter values for a specific individual. In some embodiments, a machine learning algorithm may obviate the need to sense an electrocardiogram when a particular discordance is present between parameter values of a specific individual, because of an extremely high likelihood of a presence or absence of an arrhythmia based on the parameter values as determined by the machine learning algorithm.

[0065] Any of the devices, systems, and methods for cardiac monitoring described herein may comprise one or more of a smartphone, a laptop or desktop computer, a smartwatch, or a tablet computer.

[0066] Discordance Monitoring

[0067] Fig. 7 shows a schematic of an algorithm for discordance monitoring. In a step 700, a heart rate and an activity level are sensed by, for example, a device or system as described herein. In some embodiments, an activity level is sensed with a gyroscope or an accelerometer that is. Heart rate is sensed with a light based or other commonly used heart rate sensors. The device that measures the heart rate and the activity level may be the same device or more than one device. For example, a smartwatch or other wearable device may be configured to include a heart rate sensor as well as an activity level sensor.

[0068] If, as shown in a step 702, an increased heart rate is sensed together with a normal or resting activity level, the two values are determined to be in discordance by the device or system processor. That is, the elevated heart rate does no match the sensed stable activity level. Determination of the presence of the discordance is done by a processor of either the device or system as described herein. The identified discordance may indicate the presence of an arrhythmia. As such, an ECG is caused to be sensed in a step 712A. The step 712A, may, for example, comprise indicating to the user through the device or system that sensed the heart rate and activity level to contact one or more electrodes of an ECG sensing device and thus sense the ECG. The ECG sensing device may be the device or part of the system used to sense the heart rate and activity level or may be a separate device. For example, a user wearing a smartwatch with heart rate and activity level monitoring receives an audible and/or visual indication from the smartwatch to sense an ECG when a discordance is present between a sensed heart rate value and a sensed activity level value. In some embodiments, the smartwatch comprises one or more electrodes and a user contacts one electrode with the left side of their body and one electrode with the right side of their body when an indication is received to do so from the smartwatch because a discordance is present thus sensing an ECG. In some embodiments, a smartphone comprises one or more electrodes and a user contacts one electrode with the left side of their body and one electrode with the right side of their body when an

indication is received to do so from the smartwatch because a discordance is present thus sensing an ECG.

[0069] If, as shown in step 704, an increased heart rate is sensed together with an increased heart rate variability, and a normal or resting activity level is sensed. The increased heart rate and HRV are in discordance with the normal or resting activity level, and a presence of a discordance is determined by the device or system processor. Once the discordance is determined, an ECG is caused to be sensed in a step 712B as, for example, described herein with respect to step 712A. As shown, in step 716, this particular discordance may be indicative of the presence of atrial fibrillation and it should be confirmed with the ECG 712B.

[0070] If, as shown in step 706, an increased heart rate is sensed together with a decreased heart rate variability and a normal or resting activity level is sensed. The increased heart rate, decreased heart rate variability, and normal or resting activity level are in discordance with each other, and a presence of a discordance is determined by the device or system processor. Once the discordance is determined, an ECG is caused to be sensed in a step 712C as, for example, described herein with respected to step 712A. As shown, in a step 718, supraventricular tachycardia may be present and it should be confirmed with the ECG of 712C.

[0071] If, as shown in a step 708, an increased heart rate is sensed together with an increased activity level, the device or system processor determines that no discordance is present, and an ECG is not recorded as the individual is probably exercising 714.

[0072] If, as shown in a step 710, a regular heart rate is sensed (e.g. 60-100 beats per minute) and an increased heart rate variability is sensed together with a normal or resting activity level. The normal heart rate, increased heart rate variability, and normal or resting activity level are in discordance with each other, and a presence of a discordance is determined by the device or system processor. Once the discordance is determined, an ECG is caused to be sensed in a step 712D as, for example,

described herein with respect to step 712A. As shown, in a step 720, atrial fibrillation may be present and it should be confirmed with the ECG of 712D.

[0073] In some embodiments, a determination of the presence of a discordance is based on a comparison of two or more sensed physiologic parameters with each other. That is, for example, an elevated heart rate of 110 is compared to a resting activity level as sensed by an accelerometer which measures that the individual is traveling at 0 miles/hr. The 110 heart rate is elevated whereas the activity level of 0 miles/hr is a resting level, which indicates a discordance between the sensed heart rate and activity level. In some embodiments, a processor determines that the value of a sensed physiologic parameter is either above or below a threshold value or range of values. In some embodiments, the threshold value or range of values are deemed to be normal or resting values in the population. In some embodiments, the thresholds are specific to the biometric data of the user so that the user is, for example, age-matched or gender matched to the appropriate threshold from the general population. For example, an activity level is determined to be increased in a 70 year old user but would not be increased in a 7 year old user. Thus, a discordance is determined by qualifying if a sensed physiologic parameter is elevated, decreased, or normal (or resting) and then comparing that qualified value to a qualified value of another sensed physiologic parameter. That is, for example, a value that is qualified as either increased, decreased, or normal (or resting) is compared to a value that is also qualified as increased, decreased, or normal (or resting).

[0074] In some embodiments, there is the added step (not shown in FIG. 7) of the devices and systems described herein running machine learning algorithms so that the threshold values and ranges used to determine whether a sensed physiologic parameter is increased, decreased, normal (or resting) are adjusted to more accurately fit the user. That is, for example, a user who was determined, through ECG, to have an arrhythmia at a heart rate of 80 will have their heart rate threshold lowered so that a heart of 85 (which is normal in some) would be determined to be an increased rate. The machine learning algorithm more accurately sets the thresholds over time so that

discordances are more accurately determined resulting in more accurate (and efficient) recording of ECGs in response to the determination of the presence of the discordance.

[0075] Table 1 below presents some of the information found in FIG. 7 in table form.

Table 1

HR Data	**Activity Level Data**	**HRV Data**	**Action**
HR increases	Activity level stable		Take an ECG, possible arrhythmia
HR increases	Activity level stable	HRV increases	Take an ECG, possible atrial fibrillation
HR increases	Activity level stable	HRV decreases	Take an ECG, possible supraventricular tachycardia or ventricular tachycardia
HR increases	Activity level increases		Don't take an ECG, probable exercise
HR stable	Activity level stable	HRV increases	Take an ECG, possible atrial fibrillation

[0076] While preferred embodiments of the present individual matter described herein have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the individual matter described herein. It should be understood that various alternatives to the embodiments of the individual matter described herein described herein may be employed in practicing the individual matter described herein. It is intended that the following claims define the scope of the individual matter described herein and that methods and structures within the scope of these claims and their equivalents be covered thereby.

CLAIMS

WHAT IS CLAIMED IS:

1. A method of cardiac monitoring, comprising:

sensing an activity level of a user with a first sensor of a wearable device comprising a wristlet or a smartwatch worn by the user;

when the activity level is resting, sensing a heart rate parameter of the user with a second sensor of the wearable device;

determining a discordance is present between the activity level value and the heart rate parameter; and

based on the presence of the discordance, indicating to the user, using the wearable device, of a possibility of an arrhythmia being present.

2. The method according to claim 1, wherein the heart rate parameter comprises an indication of a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

3. The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

4. The method according to claim 1, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

5. The method according to claim 1, wherein indicating to the user further comprises:

instructing the user to record an electrocardiogram ("ECG") using the wearable device.

6. The method according to claim 1, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

7. The method according to claim 1, wherein the first sensor comprises an accelerometer.

8. The method according to claim 1, wherein the first sensor comprises a gyroscope.

9. The method according to claim 1, wherein the second sensor comprises a photoplethysmogram.

10. A wearable device comprising a wristlet or a smartwatch, comprising:

a processor;

a first sensor configured to sense an activity level value of a user, wherein the first sensor is coupled to the processor;

a second sensor configured to sense a heart rate parameter of the user when the activity level value is resting, wherein the second sensor is coupled to the processor;

a non-transitory computer readable storage medium encoded with a computer program including instructions executable by the processor to cause the processor to:

determine that a discordance is present between the activity level value of the user and the heart rate parameter of the user;

based on the presence of the discordance, provide a notification of a possibility of an arrhythmia being present.

11. The wearable device according to claim 10, wherein the heart rate parameter comprises an indication a heart rate variability, and wherein the arrhythmia is atrial fibrillation.

12. The wearable device according to claim 10, wherein the heart rate parameter comprises an indication a heart rate variability and a heart rate value, and wherein the arrhythmia is atrial fibrillation.

13. The wearable device according to claim 10, wherein the heart rate parameter comprises an indication a heart rate value, and wherein the arrhythmia is atrial fibrillation.

14. The wearable device according to claim 10, wherein indicating to the user further comprises:

instructing the user to record an electrocardiogram ("ECG") using the wearable device.

15. The wearable device according to claim 10, wherein the arrhythmia is selected from a group consisting of atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia.

16. The wearable device according to claim 10, wherein the first sensor comprises an accelerometer.

17. The wearable device according to claim 10, wherein the first sensor comprises a gyroscope.

18. The wearable device according to claim 10, wherein the second sensor comprises a photoplethysmogram.

DISCORDANCE MONITORING

ABSTRACT OF THE DISCLOSURE

Described herein are systems, devices, and methods for cardiac monitoring. In particular, the systems, devices, and methods described herein may be used to conveniently sense the presence of an intermittent arrhythmia in an individual. The systems, devices, and methods described herein may be further configured to sense an electrocardiogram