PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	07 DEC 2018

Applicant's or agent's file reference	FOR FURTHER ACTION
SSGT-119WO	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 18/52776	26 September 2018 (26.09.2018)	29 September 2017 (29.09.2017)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - A61B 5/11; G08B 21/04 (2018.01)
CPC - A61B 5/0002; A61B 5/1117; A61B 5/6802; A61B 5/72; G08B 21/0446; G08B 21/0453

Applicant SENSOGRAM TECHNOLOGIES, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	15 November 2018	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-15	YES
	Claims	none	NO
Inventive step (IS)	Claims	none	YES
	Claims	1-15	NO
Industrial applicability (IA)	Claims	1-15	YES
	Claims	none	NO

2. Citations and explanations:

Claims 1, 2, 4, 8 and 11-14 lack an inventive step under PCT Article 33(3) as being obvious over US 9,489,815 B2 to Ten Kate (hereinafter 'Ten Kate') in view of US 6,819,247 B2 to Birnbach et al. (hereinafter 'Birnbach').

Regarding claim 1, Ten Kate discloses a fall detecting device (abstract, "..a fall detector..") comprising:
a housing (2) configured to be positioned adjacent a wearer's body (Fig 1, col 5, ln 12-22, "..fall detector 2 is in the form of a sensor unit that is to be worn by a user...worn at or on ...wrist..", note: a housing is deemed implicit to the fall detector 2 to contain a processor 6, sensor 4, alarm 8, memory 14, etc., within the detector 2);
a processor (6) (Fig 1, col 5, ln 27-37, "..signals output by the accelerometer 4 are provided to a processor 6..");
a sensor system (16) operatively connected to the processor (6) and configured to detect a physiological condition of the wearer's body (Fig 1, col 7, ln 4-20, "..physiological characteristic sensor (s) 16..");
a motion sensor (4) operatively connected to the processor (6) (Fig 1, col 5, ln 27-37, "..movement sensor 4..");
a wireless communication module (10, 12) operatively connected to the processor (6) (Fig 1, col 5, ln 48-59, "..transceiver circuitry 10...antenna 12...wireless telephone network..");
a memory (14) operatively connected to the processor (6), the memory (14) storing computer readable instructions (Fig 1, col 6, ln 1-6, "..memory 14...contains instructions for causing the processor 6 to operate..") that, when executed, cause the processor (6) to:
monitor the motion sensor (4) to detect acceleration in the gravitational direction to determine if a fall is occurring (Fig 2, 3, step 103, col 8, ln 29-35, "..determine whether a user may have suffered a fall from accelerometer measurements..");
start a timer upon detecting the acceleration (Fig 3, col 11, ln 51-63, "..the processor 6 can start a timer and wait until the expiry of a predetermined revocation period before triggering a normal alert..");
monitor the motion sensor (4) to determine whether the motion sensor signals a recovery-indicative acceleration prior to the timer reaching a predetermined time (Fig 3, step 113, col 11, ln 51-63, "..During the revocation period, the processor 6 monitors the movements and/or orientation of the user to determine if the user has stood up.."); and
activate the wireless communication module to initiate an emergency alert if the fall-indicative acceleration is detected and the recovery-indicative acceleration is not detected (Fig 3, step 109, col 12, ln 47-55, "If the revocation period expires without the user getting up, then a (normal) alert is triggered...sending an SMS message...wirelessly..").
Ten Kate fails to disclose causing the processor to: monitor the motion sensor to detect a decrease in the acceleration in the gravitational direction below a first predetermined threshold; start the timer upon detecting the decrease in acceleration; monitor the motion sensor to determine whether the motion sensor signals a fall-indicative acceleration above a second predetermined level prior to the timer reaching a first predetermined time;
and monitor the motion sensor to determine whether the motion sensor signals the recovery-indicative acceleration above a third predetermined level prior to the timer reaching a second predetermined time.
Birnbach is also related to a wearable detection device for detecting a motion state of a user (abstract) and teaches monitoring a motion sensor to detect a decrease in the acceleration in the gravitational direction below a first predetermined threshold (Threshold R) (Fig 1, 5, step 62, col 4, ln 42-59, "..accelerometer 10 that may record readings in 3 axes over a range of g forces..", col 7, ln 40-55, "..determination is made as to whether the acceleration...is lower than a threshold R.."); start a timer upon detecting the decrease in acceleration (Fig 5, step 64, col 7, ln 40-55, "..If the acceleration...is less than a threshod R then in step 64 a timer is started for X seconds.."); monitor the motion sensor to determine whether the motion sensor signals a fall-indicative acceleration above a second predetermined level prior to the timer reaching a first predetermined time (Fig 5, col 7, ln 62-col 8, ln 7, "..multiple embodiments may be combined...if the acceleration is over a first value, then an alert is transmitted (after opportunity for deactivation)...compared to a second range...compared to a third range.."); and monitor the motion sensor to determine whether the motion sensor signals a recovery-indicative acceleration above a third predetermined level (Threshold Q) prior to the timer reaching a second predetermined time (Fig 5, step 66, col 7, ln 40-55, "..determination is made as to whether the acceleration is greater than the threshold Q...If so, then no alert is transmitted..").
It would have been obvious to a person of ordinary skill in the art at the time of the invention to cause the processor of Ten Kate to: monitor the motion sensor to detect a decrease in the acceleration in the gravitational direction below a first predetermined threshold; start the timer upon detecting the decrease in acceleration; monitor the motion sensor to determine whether the motion sensor signals a fall-indicative acceleration above a second predetermined level prior to the timer reaching a first predetermined time; and monitor the motion sensor to determine whether the motion sensor signals the recovery-indicative acceleration above a third predetermined level prior to the timer reaching a second predetermined time to eliminate false triggering of alert as suggested by col 7, ln 25-39 of Birnbach.

see Supplemental Box

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
In claim 9, "the fall detecting device.." should be written as --The fall detecting device..-- to improve syntax.

Claims 14 and 15 lack antecedent basis for "The fall detecting method.." from claim 12. For purposes of the written opinion claims 14 and 15 are interpreted to depend from claim 13 instead of claim 12 to provide proper antecedent basis.

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Box V No 2 Citations and explanations

Regarding claim 2, Ten Kate in view of Birnbach disclose the subject matter of claim 1, as described above. Ten Kate fails to disclose the recovery-indicative acceleration comprises an average value of accelerations over time. Birnbach suggests performing multiple accelerometer readings and using an average value of accelerations in motion detection of a user (col 8, ln 19-33, "..acceleration readings may be sampled at any number of rates..", col 14, ln 45-47, "..transduce the average acceleration of a user.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide the recovery-indicative acceleration of Ten Kate in view of Birnbach to comprise an average value of accelerations over time to improve accuracy of acceleration measurements as suggested by Birnbach.

Regarding claim 4, Ten Kate in view of Birnbach disclose the subject matter of claim 1, as described above, wherein the sensor system (16) comprises a photoplethysmographic sensor (Ten Kate, Fig 1, col 7, ln 4-20, "..physiological characteristic sensor(s) 16 can include...a photoplethysmograph (PPG)..").

Regarding claim 8, Ten Kate in view of Birnbach disclose the subject matter of claim 1, as described above. Ten Kate fails to disclose a user interface on the housing. Birnbach discloses a user input (24) and display (28) as part of a monitor unit (18) (Fig 2, col 5, ln 44-51, "..deactivation means 24 may be a button or other switch that serves as a user input..", col 5, ln 66-col 6, ln 5, "..information may be displayed on display 28 as may be convenient for the user.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to include a user interface on the housing of Ted Kate in view of Birnbach to provide a deactivation means and a display to display information to a user as suggested by Birnbach.

Regarding claim 11, Ten Kate in view of Birnbach disclose the subject matter of claim 1, as described above. Ten Kate fails to specify a battery operatively connected to the processor and configured to power the fall detecting device. Birnbach suggests a battery is used to power a monitor unit (col 8, ln 19-33, "..extending battery life.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide a battery operatively connected to the processor of Ten Kate in view of Birnbach and configured to power the fall detecting device since Birnbach suggests a battery as a useful power source for a motion monitor of a user.

Regarding claim 12, Ten Kate in view of Birnbach disclose the subject matter of claim 1, as described above. Ten Kate teaches an accelerometer as the motion sensor (col 5, ln 27-37) but fails to specify the motion sensor comprises a multiaxis accelerometer. Birnbach discloses using a multiaxis accelerometer as the motion sensor (Fig 1, col 4, ln 42-59, "..record readings in 3 axes over a range of g forces...three-axis accelerometer.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to form the accelerometer of Ten Kate in view of Birnbach as a multiaxis accelerometer to provide readings in 3 axes over a range of g forces as suggested by Birnbach.

Regarding claim 13, Ten Kate discloses a fall detection method for a fall detecting device having at least one motion sensor (4) (Fig 1, abstract, "..a fall detector..", col 5, ln 27-37, "..movement sensor 4.."), the method comprising:
monitoring a physiological condition of a wearer (Fig 1, col 7, ln 4-20, "..physiological characteristic sensor (s) 16..");
monitoring the motion sensor (4) to detect acceleration in the gravitational direction to detect a fall (Fig 2, 3, step 103, col 8, ln 29-35, "..determine whether a user may have suffered a fall from accelerometer measurements..");
starting a timer upon detecting the acceleration (Fig 3, col 11, ln 51-63, "..the processor 6 can start a timer and wait until the expiry of a predetermined revocation period before triggering a normal alert..");
monitoring the motion sensor (4) to determine whether the motion sensor signals a recovery-indicative acceleration prior to the timer reaching a predetermined time (Fig 3, step 113, col 11, ln 51-63, "..During the revocation period, the processor 6 monitors the movements and/or orientation of the user to determine if the user has stood up.."); and
activating the wireless communication module to initiate an emergency alert if the fall-indicative acceleration is detected and the recovery-indicative acceleration is not detected (Fig 3, step 109, col 12, ln 47-55, "If the revocation period expires without the user getting up, then a (normal) alert is triggered...sending an SMS message...wirelessly..").
Ten Kate fails to disclose monitoring the motion sensor to detect a decrease in the acceleration in the gravitational direction below a first predetermined threshold; start the timer upon detecting the decrease in acceleration; monitor the motion sensor to determine whether the motion sensor signals a fall-indicative acceleration above a second predetermined level prior to the timer reaching a first predetermined time; and monitor the motion sensor to determine whether the motion sensor signals the recovery-indicative acceleration above a third predetermined level prior to the timer reaching a second predetermined time.
Birnbach is also related to a wearable detection device for detecting a motion state of a user (abstract) and teaches monitoring a motion sensor to detect a decrease in the acceleration in the gravitational direction below a first predetermined threshold (Threshold R) (Fig 1, 5, step 62, col 4, ln 42-59, "..accelerometer 10 that may record readings in 3 axes over a range of g forces..", col 7, ln 40-55, "..determination is made as to whether the acceleration...is lower than a threshold R.."); start a timer upon detecting the decrease in acceleration (Fig 5, step 64, col 7, ln 40-55, "..If the acceleration...is less than a threshod R then in step 64 a timer is started for X seconds.."); monitor the motion sensor to determine whether the motion sensor signals a fall-indicative acceleration above a second predetermined level prior to the timer reaching a first predetermined time (Fig 5, col 7, ln 62-col 8, ln 7, "..multiple embodiments may be combined...if the acceleration is over a first value, then an alert is transmitted (after opportunity for deactivation)...compared to a second range...compared to a third range.."); and monitor the motion sensor to determine whether the motion sensor signals a recovery-indicative acceleration above a third predetermined level (Threshold Q) prior to the timer reaching a second predetermined time (Fig 5, step 66, col 7, ln 40-55, "..determination is made as to whether the acceleration is greater than the threshold Q...If so, then no alert is transmitted.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention, in the method of Ten Kate, to: monitor the motion sensor to detect a decrease in the acceleration in the gravitational direction below a first predetermined threshold; start the timer upon detecting the decrease in acceleration; monitor the motion sensor to determine whether the motion sensor signals a fall-indicative acceleration above a second predetermined level prior to the timer reaching a first predetermined time; and monitor the motion sensor to determine whether the motion sensor signals the recovery-indicative acceleration above a third predetermined level prior to the timer reaching a second predetermined time to eliminate false triggering of alert as suggested by col 7, ln 25-39 of Birnbach.

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Regarding claim 14, Ten Kate in view of Birnbach disclose the subject matter of claim 13, as described above. Ten Kate fails to disclose the recovery-indicative acceleration comprises an average value of accelerations over time. Birnbach suggests performing multiple accelerometer readings and using an average value of accelerations in motion detection of a user (col 8, ln 19-33, "..acceleration readings may be sampled at any number of rates..", col 14, ln 45-47, "..transduce the average acceleration of a user.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide the recovery-indicative acceleration of Ten Kate in view of Birnbach to comprise an average value of accelerations over time to improve accuracy of acceleration measurements as suggested by Birnbach.

Claim 9 lacks an inventive step under PCT Article 33(3) as being obvious over Ten Kate in view of Birnbach, and further in view of US 7,616,110 B2 to Crump et al. (hereinafter 'Crump').

Regarding claim 9, Ten Kate in view of Birnbach disclose the subject matter of claim 8, as described above, but fail to disclose wherein the user interface includes a manually-operable emergency alert input operable to cause the processor to activate the wireless communication module to initiate an emergency alert. Crump is also related to a wearable healthcare detecting device (abstract) and teaches a user interface is configured to provide visual information regarding the physiological condition of the wearer's body (Fig 1, col 4, ln 62-col 5, ln 19, "..a panic button may be disposed on the monitor 102, allowing a wearer or other person to send a signal to a remotely located party..", note: Fig 1 indicates a wireless network is used for sending the signal). It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide the user interface of Ted Kate in view of Birnbach with a manually-operable emergency alert input operable to cause the processor to activate the wireless communication module to initiate an emergency alert to provide a user with a capability to send a signal to a remotely located party as suggested by Crump.

Claim 10 lacks an inventive step under PCT Article 33(3) as being obvious over Ten Kate in view of Birnbach, and further in view of US 2009/0069642 A1 to Gao et al. (hereinafter 'Gao').

Regarding claim 10, Ten Kate in view of Birnbach disclose the subject matter of claim 8, as described above, but fail to disclose wherein the user interface is configured to provide visual information regarding the physiological condition of the wearer's body. Gao is also realted to a wearable health monitor (abstract) and teaches a user interface is configured to provide visual information regarding the physiological condition of the wearer's body (Fig 1A, para [0040], "..The processor may locally (at the level of the wearable patient monitor) display patient status indicators from the data collected (e.g., heart rate, ECG, temperature, pain level, etc.) via a monitor output 115.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to configure the user interface of Ten Kate in view of Bimbach to provide visual information regarding the physiological condition of the wearer's body to provide infomation such as heart rate, ECG, temperature, pain level to the wearer as suggested by Gao.

Claims 3 and 15 lack an inventive step under PCT Article 33(3) as being obvious over Ten Kate in view of Birnbach, and further in view of US 2012/0101411 A1 to Hausdorff et al. (hereinafter 'Hausdorff').

Regarding claim 3, Ten Kate in view of Birnbach disclose the subject matter of claim 1, as described above, but fail to disclose wherein the computer readable instructions further cause the processor to activate a speaker to prompt the wearer to confirm or dismiss an initiation of an emergency alert. Hausdorff is also related to a fall detector (abstract) and suggests a processor to activate a speaker to prompt a wearer to confirm or dismiss an initiation of an emergency alert (Fig 2A, para [0135], "..upon detecting a near fall or fall, speaker 48 could emit an audible beep and then deliver a message in the form of a human voice asking if the person is ok, and requesting person 22 to press a button on the device or screen for confirmation.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to cause the computer readable instructions to further cause the processor of Ten Kate in view of Birnbach to activate a speaker to prompt the wearer to confirm or dismiss an initiation of an emergency alert to verify whether a user needs assistance as suggested by Hausdorff.

Regarding claim 15, Ten Kate in view of Birnbach disclose the subject matter of claim 12, as described above, but fail to disclose activating a speaker to prompt the wearer to confirm or dismiss an initiation of an emergency alert. Hausdorff is also related to a fall detector (abstract) and suggests a processor to activate a speaker to prompt a wearer to confirm or dismiss an initiation of an emergency alert (Fig 2A, para [0135], "..upon detecting a near fall or fall, speaker 48 could emit an audible beep and then deliver a message in the form of a human voice asking if the person is ok, and requesting person 22 to press a button on the device or screen for confirmation.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention, in the method of Ten Kate in view of Birnbach, to activate a speaker to prompt the wearer to confirm or dismiss an initiation of an emergency alert to verify whether a user needs assistance as suggested by Hausdorff.

Claims 5-7 lack an inventive step under PCT Article 33(3) as being obvious over Ten Kate in view of Birnbach, and further in view of US 2017/0014572 A1 to Newberry et al. (hereinafter 'Newberry').

Regarding claim 5, Ten Kate in view of Birnbach disclose the subject matter of claim 4, as described above, but fail to disclose the computer readable instructions further cause the processor to: operate the photoplethysmographic sensor to detect blood flow information; determine a heart rate of the wearer based on the blood flow information; and display the heart rate on a user interface.
Newberry is also related to wearable physiological sensors (abstract) and teaches operating a wearable photoplethysmographic sensor to detect blood flow information; determine a heart rate of the wearer based on the blood flow information; and display the heart rate on a user interface (Fig 2, para [0031], "..biosensor (IDDB) system is implemented on a compact form factor such as on a patch or arm band..", para [0035], "..The biosensor system may also include a photoplethysmography (PPG) circuit 110...configured to detect...heart rate, blood pressure..", para [0048], ".IDDB system 100 may also include a display 230...graphical user interface (GUI) that includes biosensor data..", para [0082], "..photoplethysmography (PPG) techniques for obtaining concentration levels or indicators of one or more substances in pulsating arterial blood flow.."). (claim 5 continued)

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(claim 5 continued) It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide the computer readable instructions to further cause the processor of Ten Kate in view of Birnbach to: operate the photoplethysmographic sensor to detect blood flow information; determine a heart rate of the wearer based on the blood flow information; and display the heart rate on a user interface to facilitate awareness of physiological information to a user as suggested by Newberry

Regarding claim 6, Ten Kate in view of Birnbach disclose the subject matter of claim 4, as described above, wherein the computer readable instructions further cause the processor to: operate the photoplethysmographic sensor for a first detection time period following an initial activation of the fall detecting device (Ten Kate, Fig 2, 3, step 105, col 8, ln 63-65).
Ted Kate in view of Birnbach fail to disclose wherein the computer readable instructions further cause the processor to:
operate the photoplethysmographic sensor to detect a first set of blood flow information for a first detection time period following the initial activation; determine a first heart rate of the wearer during the first detection time period based on the first set of blood flow information; display the first heart rate on a user interface; operate the photoplethysmographic sensor to detect a second set of blood flow information for a second detection time period following the first detection time period; determine a second heart rate of the wearer during the second detection time period based on the second set of blood flow information; and display the second heart rate on the user interface.
Newberry is also related to wearable physiological sensors (abstract) and suggests operating a photoplethysmographic sensor to detect a first set of blood flow information for a first detection time period following an initial activation (Fig 2, para [0031], "..biosensor (IDDB) system is implemented on a compact form factor such as on a patch or arm band..", para [0035], "..The biosensor system may also include a photoplethysmography (PPG) circuit 110...configured to detect...heart rate, blood pressure..", para [0082], "..photoplethysmography (PPG) techniques for obtaining concentration levels or indicators of one or more substances in pulsating arterial blood flow..");
determine a first heart rate of the wearer during the first detection time period based on the first set of blood flow information (Fig 2, para [0035], "..The biosensor system may also include a photoplethysmography (PPG) circuit 110...configured to detect...heart rate, blood pressure..");
display the first heart rate on a user interface (Fig 2, para [0048], ".IDDB system 100 may also include a display 230...graphical user interface (GUI) that includes biosensor data..");
operate the photoplethysmographic sensor to detect a second set of blood flow information for a second detection time period following the first detection time period (Fig 2, para [0082], "..photoplethysmography (PPG) techniques for obtaining concentration levels or indicators of one or more substances in pulsating arterial blood flow..", para [0108], "..The measurement process is repeated sequentially...measurements over a desired measurement period, e.g., from 1-2 seconds to 1-2 minutes or 2-3 hours..");
determine a second heart rate of the wearer during the second detection time period based on the second set of blood flow information (Fig 2, para [0035], "..The biosensor system may also include a photoplethysmography (PPG) circuit 110...configured to detect...heart rate, blood pressure..", para [0108], "..The measurement process is repeated sequentially...measurements over a desired measurement period, e.g., from 1-2 seconds to 1-2 minutes or 2-3 hours.."); and
display the second heart rate on the user interface (Fig 2, para [0048], ".IDDB system 100 may also include a display 230...graphical user interface (GUI) that includes biosensor data..", para [0108], "..The measurement process is repeated sequentially...measurements over a desired measurement period, e.g., from 1-2 seconds to 1-2 minutes or 2-3 hours..").
It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide the computer readable instructions to further cause the processor of Ten Kate in view of Birnbach to: operate the photoplethysmographic sensor to detect a first set of blood flow information for a first detection time period following the initial activation; determine a first heart rate of the wearer during the first detection time period based on the first set of blood flow information; display the first heart rate on a user interface; operate the photoplethysmographic sensor to detect a second set of blood flow information for a second detection time period following the first detection time period; determine a second heart rate of the wearer during the second detection time period based on the second set of blood flow information; and display the second heart rate on the user interface to facilitate awareness of physiological information to a user as suggested by Newberry.

Regarding claim 7, Ten Kate in view of Birnbach and Newberry disclose the subject matter of claim 6, as described above, but fail to disclose wherein the second period of time is longer than the first period of time. However, Newberry suggests sequential measurements and desired measurement periods of progressively longer lengths (para [0108], "..The measurement process is repeated sequentially...measurements over a desired measurement period, e.g., from 1-2 seconds to 1-2 minutes or 2-3 hours.."). It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide the second period of time of Ten Kate in view of Birnbach and Newberry to be longer than the first period of time since Newberry suggests progressively longer time periods and sequential measurements and when the general condition of a claim is disclosed by the prior art it is not inventive to discover an optimum or workable range of operation.

Claims 1-15 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.