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(54) **BIOWATCH**

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A61B 5/1455	(2006.01)
A61B 5/021	(2006.01)

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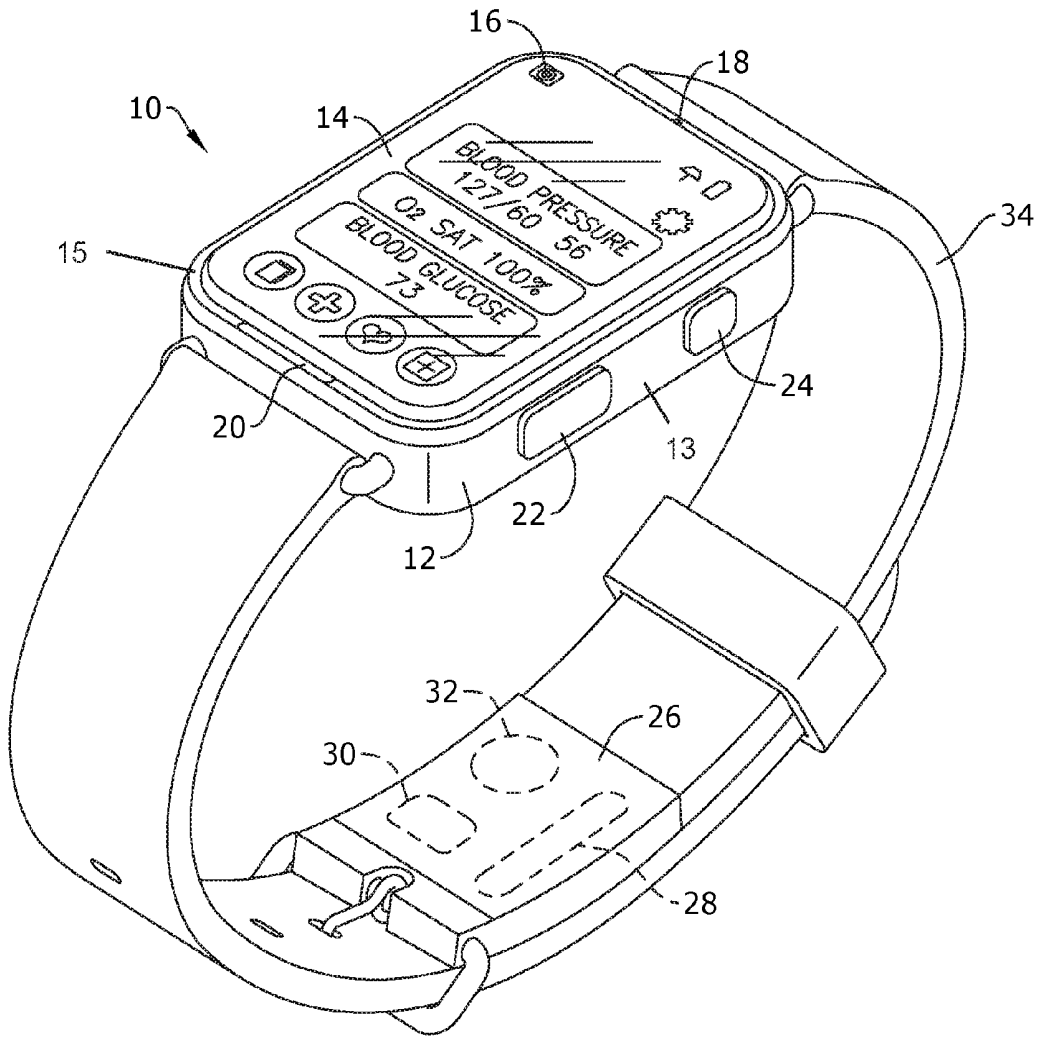
CPC ***A61B 5/746*** (2013.01); ***A61B 5/0002*** (2013.01); ***A61B 5/14551*** (2013.01); ***A61B 5/14532*** (2013.01); ***A61B 5/0008*** (2013.01); ***A61B 5/02141*** (2013.01); ***A61B 5/02438*** (2013.01); ***A61B 5/681*** (2013.01); ***H04W 4/025*** (2013.01); ***H04B 1/385*** (2013.01); ***H04L 43/16*** (2013.01)

(57) **ABSTRACT**

A wrist-worn biowatch providing various health monitoring functions such as blood glucose level monitoring, blood pressure detection, pulse monitoring, heart stop detection, oxygen saturation saturation monitoring, and Ketoacidosis detection, wherein the biowatch is actively monitoring the wellness data of its wearer, and adapted to alert the user and medical professionals if such wellness data veers outside normal ranges or acceptable trends.



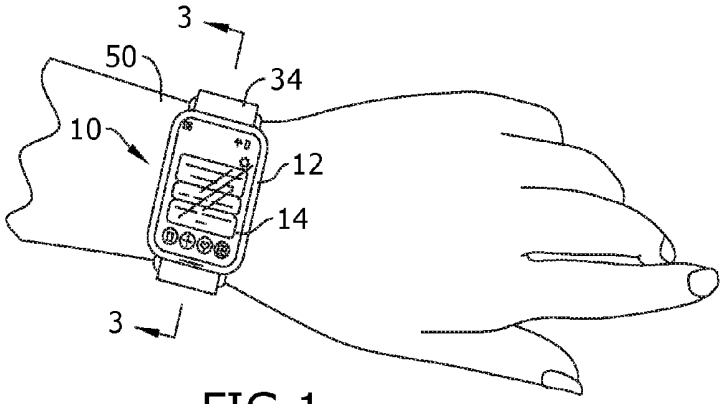

3
50
34
10
12
14
3

FIG.1

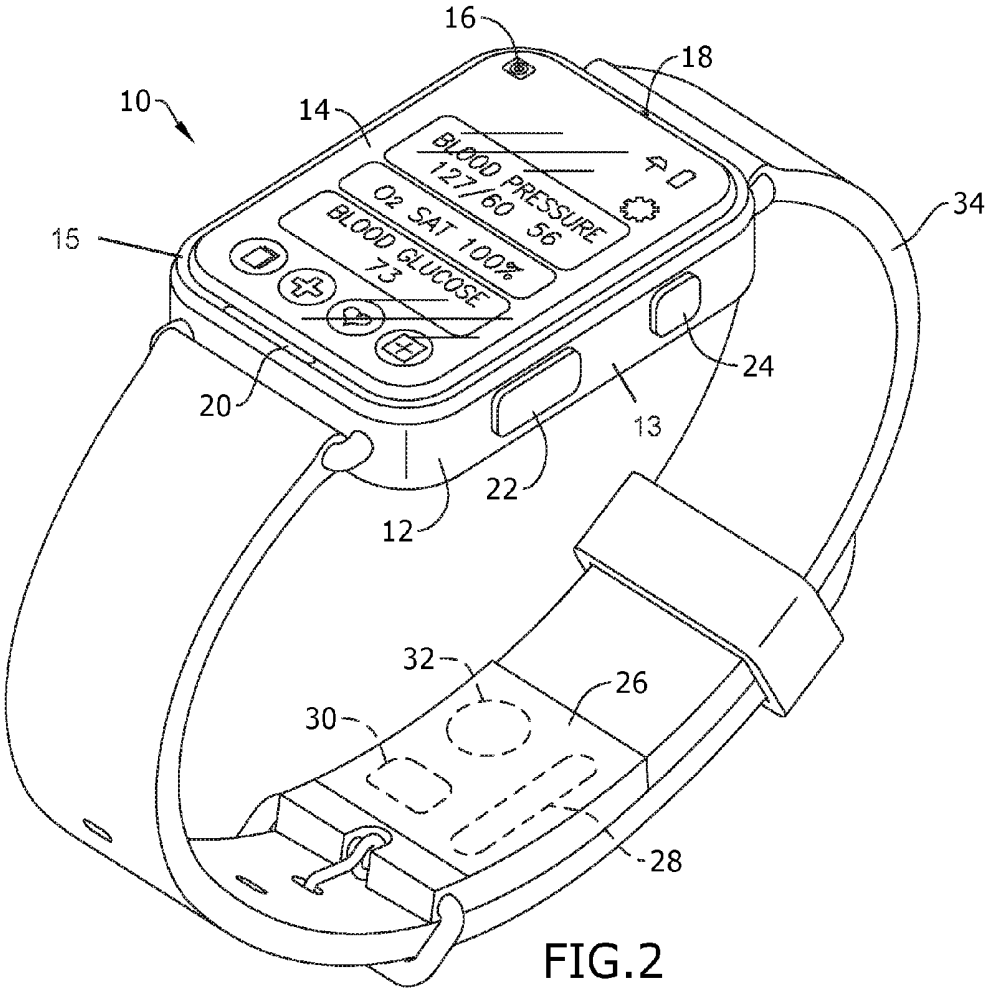

16
18
10
14
BLOOD PRESSURE
127/60 56
O2 SAT 100%
BLOOD GLUCOSE
73
34
15
24
20
13
22
12
32
26
30
28

FIG.2

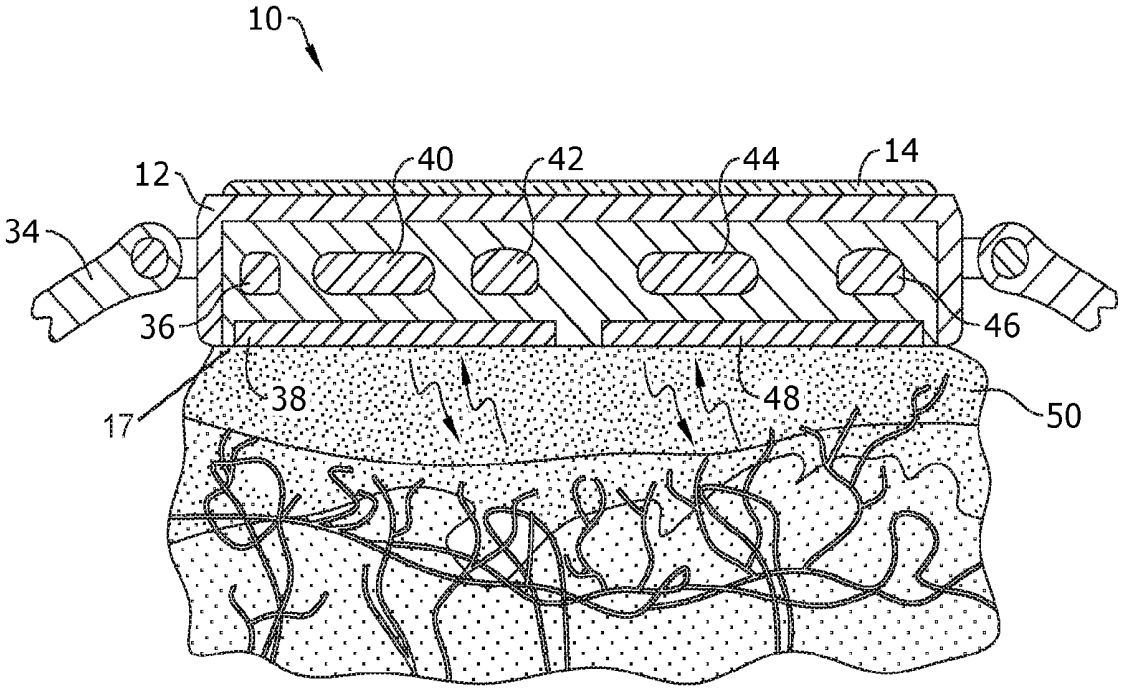


FIG.3

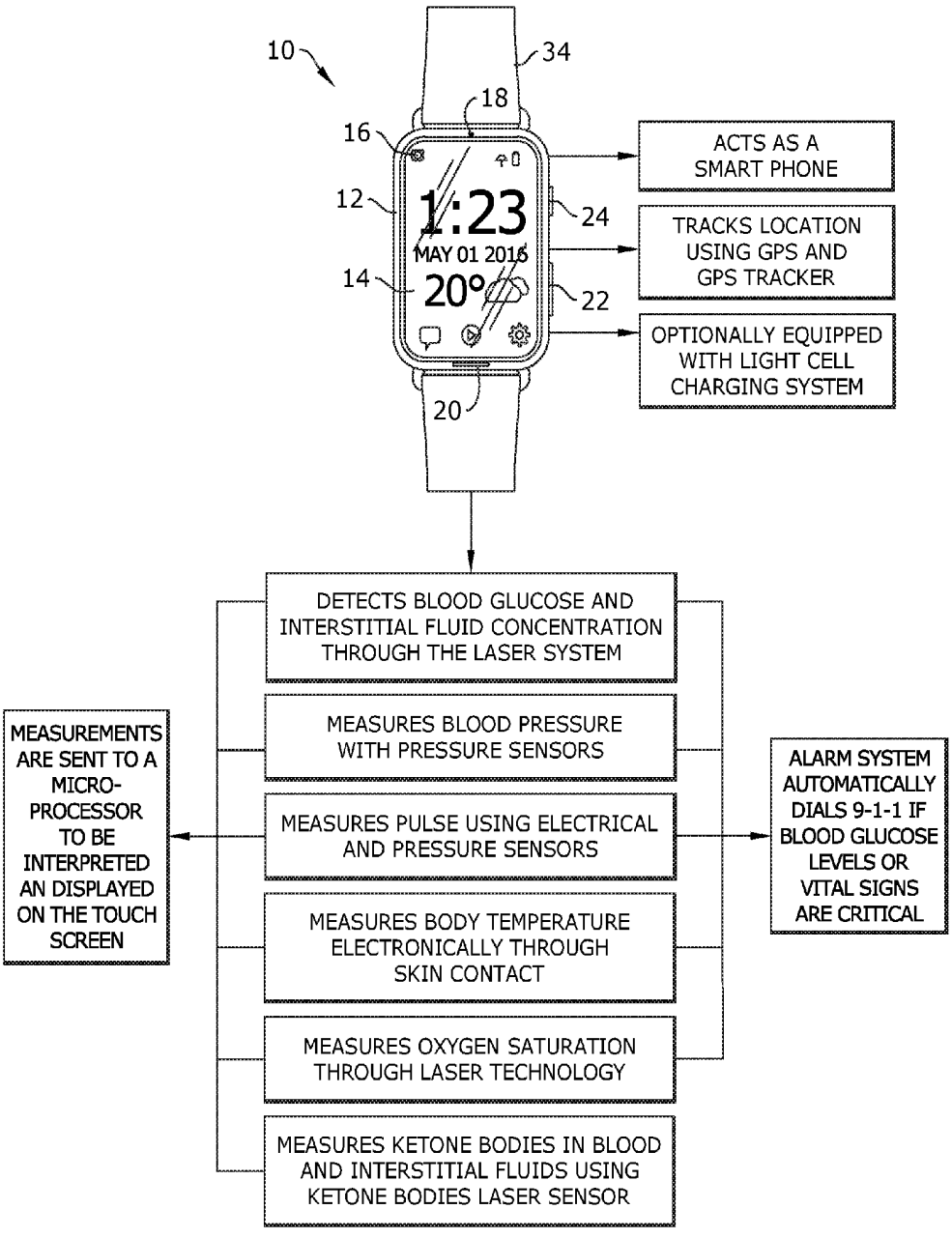

10
34
18
16
12
14
1:23
MAY 01 2016
20°
24
22
20
ACTS AS A SMART PHONE
TRACKS LOCATION USING GPS AND GPS TRACKER
OPTIONALLY EQUIPPED WITH LIGHT CELL CHARGING SYSTEM
DETECTS BLOOD GLUCOSE AND INTERSTITIAL FLUID CONCENTRATION THROUGH THE LASER SYSTEM
MEASURES BLOOD PRESSURE WITH PRESSURE SENSORS
MEASURES PULSE USING ELECTRICAL AND PRESSURE SENSORS
MEASURES BODY TEMPERATURE ELECTRONICALLY THROUGH SKIN CONTACT
MEASURES OXYGEN SATURATION THROUGH LASER TECHNOLOGY
MEASURES KETONE BODIES IN BLOOD AND INTERSTITIAL FLUIDS USING KETONE BODIES LASER SENSOR
MEASUREMENTS ARE SENT TO A MICRO-PROCESSOR TO BE INTERPRETED AN DISPLAYED ON THE TOUCH SCREEN
ALARM SYSTEM AUTOMATICALLY DIALS 9-1-1 IF BLOOD GLUCOSE LEVELS OR VITAL SIGNS ARE CRITICAL

FIG.4

BIOWATCH

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of priority of U.S. provisional application Ser. No. 62/236,677, filed Oct. 2, 2015, the contents of which are herein incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to health monitoring devices and, more particularly, to a biowatch providing various health monitoring functions such as blood glucose level monitoring, blood pressure detection, pulse monitoring, heart stop detection, oxygen saturation monitoring, Ketoacidosis detection and location positioning.

[0003] For many people, actively monitoring certain vital signs and wellness data can mean the difference between life and death. Many forms of such health monitoring are, however, invasive, requiring the drawing of blood to measure blood glucose level, for example. Likewise, such forms of health monitoring typically require the user to actively seek out and set aside time for the monitoring. Human nature being what it is, many individuals who should be actively monitoring certain vital signs and wellness data do not, even though their life may depend on it.

[0004] As can be seen, there is a need for a wrist-worn biowatch providing various health monitoring functions such as blood glucose level monitoring, blood pressure detection, pulse monitoring, heart stop detection, oxygen saturation monitoring, and Ketoacidosis detection, wherein the biowatch is actively monitoring the wellness data of its wearer, and adapted to alert the user and medical professionals if such wellness data veers outside normal ranges or acceptable trends.

SUMMARY OF THE INVENTION

[0005] In one aspect of the present invention, a wrist-worn biowatch including a body defined by a distal surface and an opposing proximal surface; a wrist band connected to the body; a band sensor housing provided along the wrist band, wherein the wrist band is adapted to move between an open condition and a closed condition wrapped around a wrist of a user so that the proximal surface abuts an anterior portion of the wrist, and wherein the band sensor housing abuts a posterior portion of the wrist; and the proximal surface and the band sensor housing each providing at least one wellness sensor adapted to measure wellness data.

[0006] In another aspect of the present invention, the wrist-worn biowatch includes a body defined by a distal surface and an opposing proximal surface; a wrist band connected to the body; an audio device; a global positioning system; a band sensor housing provided along the wrist band, wherein the wrist band is adapted to move between an open condition and a closed condition wrapped around a wrist of a user so that the proximal surface abuts an anterior portion of the wrist, and wherein the band sensor housing abuts a posterior portion of the wrist; a pulse sensor disposed along the band sensor housing to abut a radial artery of the posterior portion of the wrist; the proximal surface and the band sensor housing each providing at least one wellness sensor adapted to measure wellness data; a laser coupled to one or more of the at least one wellness sensor; a microprocessor coupled to the pulse sensor and the at least one wellness sensor, wherein the microprocessor is configured to send an alarm when wellness data measured by the at least one wellness sensor exceeds an associated predetermined threshold stored in the microprocessor, wherein the alarm includes an electronically exportable message and an audio output from the audio device, and wherein the electronically exportable includes a current global position as determined by the global positioning system, and wherein the at least one wellness sensor includes a Ketone sensor and wherein the at least one wellness sensor is selected from the group consisting of a blood glucose sensor, a blood pressure sensor, and an oxygen saturation sensor. These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** is a perspective view of an exemplary embodiment of the present invention, shown in use;

[0008] FIG. **2** is a perspective view of an exemplary embodiment of the present invention, shown in use demonstrating a display mode;

[0009] FIG. **3** is a section view of an exemplary embodiment of the present invention, taken along line **3-3** of FIG. **1**; and

[0010] FIG. **4** is a schematic view of an exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0011] The following detailed description is of the best currently contemplated modes of carrying out exemplary embodiments of the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

[0012] Broadly, an embodiment of the present invention provides a wrist-worn biowatch providing various health monitoring functions such as blood glucose level monitoring, blood pressure detection, pulse monitoring, heart stop detection, oxygen saturation monitoring, and Ketoacidosis detection, wherein the biowatch is actively monitoring the wellness data of its wearer, and adapted to alert the user and medical professionals if such wellness data veers outside normal ranges or acceptable trends.

[0013] Referring to FIGS. **1** through **4**, the present invention may include a biowatch **10** communicably coupled with a microprocessor. The biowatch **10** provides a body **12** connected to a watch band **34** dimensioned and adapted to be movable between an open condition and a closed condition securing the biowatch **10** around the wrist **50** of a user. The body **12** provide a distal surface **15** providing a touchscreen **14** accessible to the other hand of the user when the biowatch **10** is wrist worn, for example when the wrist band **34** is in the closed condition, as illustrated in FIG. **2**. Opposite the distal surface **15**, interconnected by a plurality of sidewalls **13**, is a proximal surface **17** that contacts the anterior portion of the user's wrist **50**, as illustrated in FIG. **3**. The biowatch **10** may include a GPS/camera **16**, a microphone **18**, an audio output device **20** such as a speaker, and other convention smart phone technologies. The bio-

watch **10** may include a plurality of wellness sensors coupled to the microprocessor for measuring wellness data. Wellness data may include blood glucose level, blood pressure level, pulse rate, heart activity, oxygen saturation level, Ketoacidosis levels and the like. The microprocessor may provide an alarm system adapted to analyze the wellness data so that, in one embodiment, the microprocessor generates alarms if the value of any of the wellness data exceeds predetermined thresholds, wherein said thresholds are likely established by medical professionals. In such a case, microprocessor may generate exportable messages, for example phone messages, email messages and SMS messages sent to user-specified addresses, such as 911. Biowatch **10** may be adapted to send a loud alarm through the audio device **20** to its wears if any of the above wellness data is above the predetermined thresholds, automatically calling 911 if the value continues to be alarmingly without interference. The alarm system may be coupled with the GPS so as the above mentioned alarm message (911 call, SMS or email) includes the user's current location.

[0014] In another embodiment, the microprocessor may be adapted to represent any of the wellness data on the user interface/touchscreen **14** for the user to toggle to via a change to screen button **24**, and toggle back to conventional smart phone technologies via a change to mobile button **22**.

[0015] The wellness sensors may be housed in the body **12** while others may be housed a band sensor housing **26** provided by the watch band **34**. In the closed condition the band sensor housing **26** contacts the posterior portion of the user's wrist when the wrist band **34** is in the closed condition. To wit, a blood pressure sensor **28** and a pulse sensor **30** may be provided in the sensor housing **26**, wherein the pulse sensor **30** is disposed (or a portion of the band sensor housing **26** in communication with the pulse sensor **30**) abuts the radial artery of the user's wrist **50**, thereby the pulse sensor **30** may be adapted to determine a user's pulse when the biowatch **10** is wrist worn. In certain embodiments, the pulse sensor **30** may be pressure and/or electrical sensors adapted to determine the user's pulse and send alarms based on arrhythmia and/or heart disease thresholds. The blood pressure sensor **28** may be pressure pads adapted to determine the user's blood pressure and send alarms based on hypertension and/or hypotension thresholds. Similarly, the pulse sensor **30** and the blood pressure sensor **28** may be adapted to determine if the user's heart stops for a predetermined length of time and send alarms based on heart attack and/or asystole thresholds. The biowatch **10** may provide a temperature sensor **36** coupled directly or indirectly to the proximal surface for measuring the body temperature of the user.

[0016] A blood glucose sensor **48** and Ketone sensor **38** may be disposed along the proximal surface **17** of the body **12**, as illustrated in FIG. **3**. The blood glucose sensor **48** may provide a non-invasive laser sensor or far infrared sensor **46** coupled with an associated receiver **44** so that the blood glucose sensor **48** is adapted to determine the concentration of glucose in the users' serum and send alarms based on diabetes and/or hypoglycemia thresholds. The Ketone sensor **38** may provide a non-invasive laser sensor or far infrared sensor **42** coupled with an associated receiver **40** so that the Ketone sensor **38** is adapted to detect Ketoacidosis in the user's serum and send alarms based on diabetic-related thresholds. It being understood that the lasers **42**, **46** are coupled to the skin of the user when the biowatch **10** is in use, such as when wrist worn.

[0017] The GPS **16** may include a GPS tracking system adapted so that if the user/wearer becomes lost, the alarm system will call **911** or home by pressing a button. Likewise, a user may push a button if he or she is in danger.

[0018] The plurality of wellness sensors may be coupled to a power source **32**, such as a battery or an alternative light cell charging system, provided by the biowatch **10**. The biowatch **10** is adapted to accept additive technologies, such as a creative level sensor, that can be coupled with the lasers **42**, **46** and receivers **40**, **44**. Likewise, the biowatch **10** may provide an oxygen saturation sensor coupled with a non-invasive laser **42** or **46** and an associated receiver **40** or **44** so that the oxygen saturation sensor **48** is adapted for measuring the oxygen saturation of the user.

[0019] The location of the wellness sensors may be arranged differently than shown in the figures, i.e., some shown in the wrist band **34** may be along the proximal surface **17** and vice versa, as long as they function (for example, are touching or otherwise coupled to the skin of the user) in accordance with the present invention has disclosed herein.

[0020] A method of using the present invention may include the following. A user may program the microprocessor to set the thresholds associated with each wellness sensor. Similarly, the user may also program each wellness sensor to obtains measurement at certain predetermined intervals, for example the blood glucose sensor **48** may be programmed to determine the user's blood sugar once, twice or so many times a day. The user then wears the biowatch **22** around their wrist with the wrist band **34** in the closed condition so that the band sensor housing **26** is operable, and then uses the change to screen button **24** to get the touchscreen **14** to display representations of the wellness data, wherein the user may toggle back to conventional smart phone technologies via the change to mobile button **22**.

[0021] It should be understood, of course, that the foregoing relates to exemplary embodiments of the invention and that modifications may be made without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. A wrist-worn device, comprising:

a body defined by a distal surface and an opposing proximal surface;

a wrist band connected to the body;

a band sensor housing provided along the wrist band,

wherein the wrist band is adapted to move between an open condition and a closed condition wrapped around a wrist of a user so that the proximal surface abuts an anterior portion of the wrist, and wherein the band sensor housing abuts a posterior portion of the wrist; and

the proximal surface and the band sensor housing each providing at least one wellness sensor adapted to measure wellness data.

2. The wrist-worn device of claim **1**, wherein the least one wellness sensor includes a pulse sensor disposed along the band sensor housing to abut a radial artery of the posterior portion of the wrist.

3. The wrist-worn device of claim **1**, further comprising a microprocessor provided coupled to the at least one wellness sensor, wherein the microprocessor is configured to send an

alarm when wellness data measured by the at least one wellness sensor exceeds an associated predetermined threshold stored in the microprocessor.

4. The wrist-worn device of claim **3**, wherein the alarm includes an electronically exportable message.

5. The wrist-worn device of claim **4**, further comprising an audio device provided by the wrist-worn device, wherein the alarm includes an audio output from the audio device.

6. The wrist-worn device of claim **4**, further comprising a global positioning system provided by the wrist-worn device, wherein the electronically exportable includes a current global position as determined by the global positioning system.

7. The wrist-worn device of claim **1**, further comprising a laser coupled to one or more of the at least one wellness sensor.

8. The wrist-worn device of claim **1**, wherein the at least one wellness sensor includes a Ketone sensor.

9. The wrist-worn device of claim **1**, wherein the at least one wellness sensor is selected from the group consisting of a blood glucose sensor, a blood pressure sensor, and an oxygen saturation sensor.

10. A wrist-worn device, comprising:

a body defined by a distal surface and an opposing proximal surface;

a wrist band connected to the body;

an audio device;

a global positioning system;

a band sensor housing provided along the wrist band, wherein the wrist band is adapted to move between an open condition and a closed condition wrapped around a wrist of a user so that the proximal surface abuts an anterior portion of the wrist, and wherein the band sensor housing abuts a posterior portion of the wrist;

a pulse sensor disposed along the band sensor housing to abut a radial artery of the posterior portion of the wrist;

the proximal surface and the band sensor housing each providing at least one wellness sensor adapted to measure wellness data;

a laser coupled to one or more of the at least one wellness sensor;

a microprocessor coupled to the pulse sensor and the at least one wellness sensor, wherein the microprocessor is configured to send an alarm when wellness data measured by the at least one wellness sensor exceeds an associated predetermined threshold stored in the microprocessor, wherein the alarm includes an electronically exportable message and an audio output from the audio device, and wherein the electronically exportable includes a current global position as determined by the global positioning system, and

wherein the at least one wellness sensor includes a Ketone sensor and wherein the at least one wellness sensor is selected from the group consisting of a blood glucose sensor, a blood pressure sensor, and an oxygen saturation sensor.

* * * * *

专利名称(译)	生物观察		
公开(公告)号	US20170095216A1	公开(公告)日	2017-04-06
申请号	US15/232080	申请日	2016-08-09
申请(专利权)人(译)	laty，马克		
当前申请(专利权)人(译)	laty，马克		
[标]发明人	LATY MARK		
发明人	LATY, MARK		
IPC分类号	A61B5/00 A61B5/145 H04L12/26 A61B5/024 H04W4/02 H04B1/3827 A61B5/1455 A61B5/021		
CPC分类号	A61B5/746 A61B5/0002 A61B5/14551 A61B5/14532 A61B5/0008 H04L43/16 A61B5/02438 A61B5/681 H04W4/025 H04B1/385 A61B5/02141 A61B5/02055 A61B5/14546 A61B5/1455 A61B5/14552 H04B2001/3861		
优先权	62/236677 2015-10-02 US		
外部链接	Espacenet USPTO		

摘要(译)

提供各种健康监测功能（例如血糖水平监测，血压检测，脉搏监测，心脏停止检测，氧饱和饱和度监测和酮症酸中毒检测）的手腕式生物制剂，其中生物制剂主动监测其佩戴者的健康数据，并且适于警告用户和医疗专业人员，如果这样的健康数据偏离正常范围或可接受的趋势。