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Zhu (43) **Pub. Date: Apr. 18, 2019**

(54) **INTERCHANGEABLE WEARABLE DEVICE**

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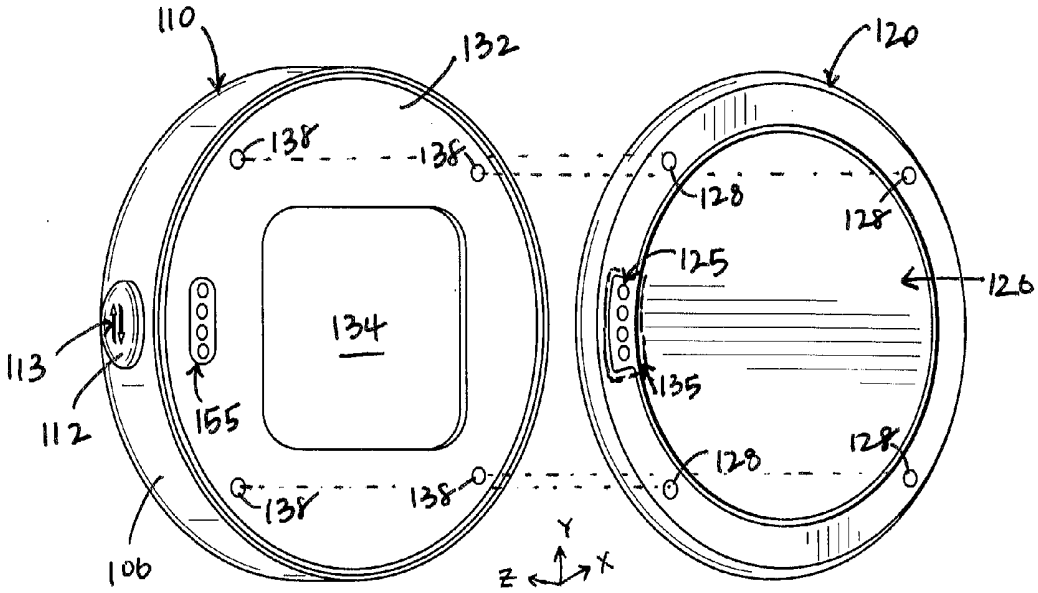
A61B 5/0205	(2006.01)
A61B 5/0404	(2006.01)

(52) **U.S. Cl.**

CPC ***A61B 5/681*** (2013.01); ***A61B 5/02055*** (2013.01); ***A61B 5/0404*** (2013.01); *A61B 5/02438* (2013.01); ***A61B 5/7445*** (2013.01); ***A61B 5/7475*** (2013.01); ***A61B 5/7405*** (2013.01)

(57) **ABSTRACT**

Disclosed is a wearable device with different types of interchangeable accessory covers that may be removably attached thereto. The wearable device has a processor and sensor(s) for taking measurements (e.g., for health of a user), as well as buttons on its opposing sides, one of which includes braille thereon for distinguishing purposes. Each of the covers includes a different accessory—e.g., necklace attachment portion, clip, watch lugs, sensors—or combination thereof, enabling different options to a user for wearing the wearable device. In one option, the covers are attached to a back of the wearable device. Each cover is configured to provide accessibility to an electrical connector of the wearable device. In some cases, the covers themselves include an electrical connector portion that is used to establish an electrical connection between the processor of the wearable device and an external device to communicate measurements via the attached interchangeable accessory cover.



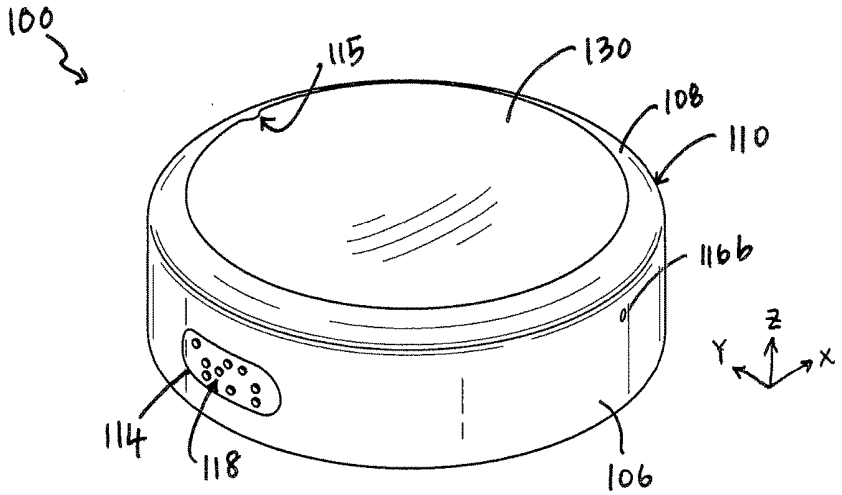

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FIG. 1A

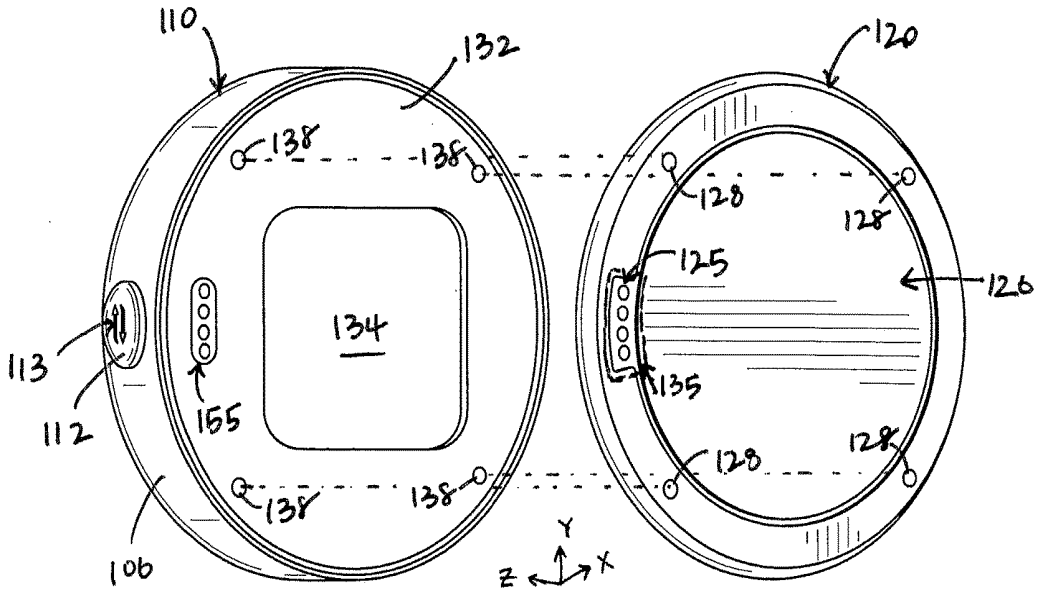
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FIG. 1 I

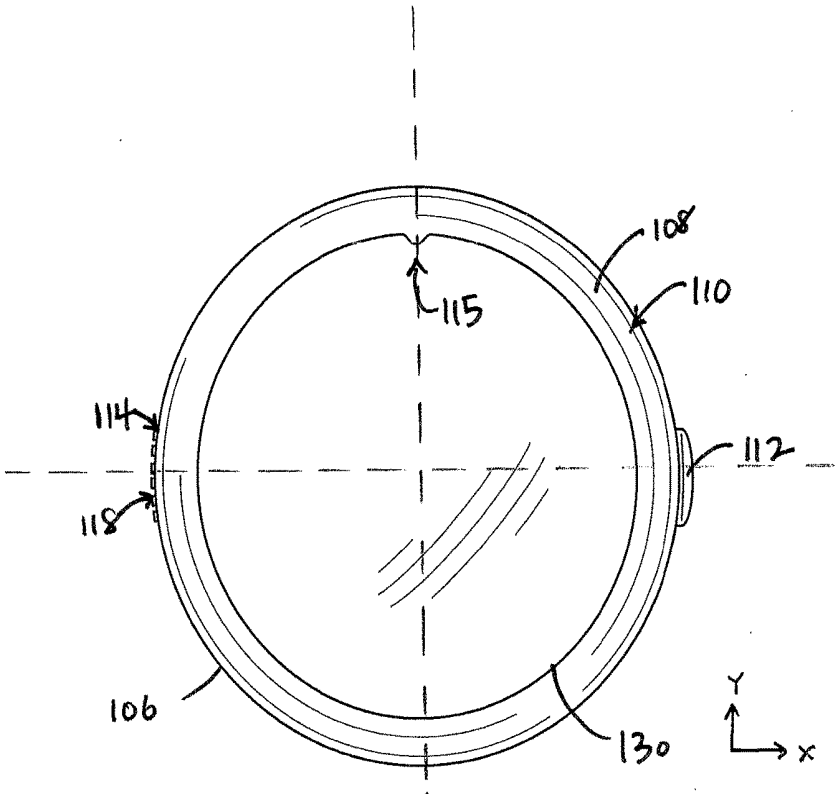

FIG. 1B

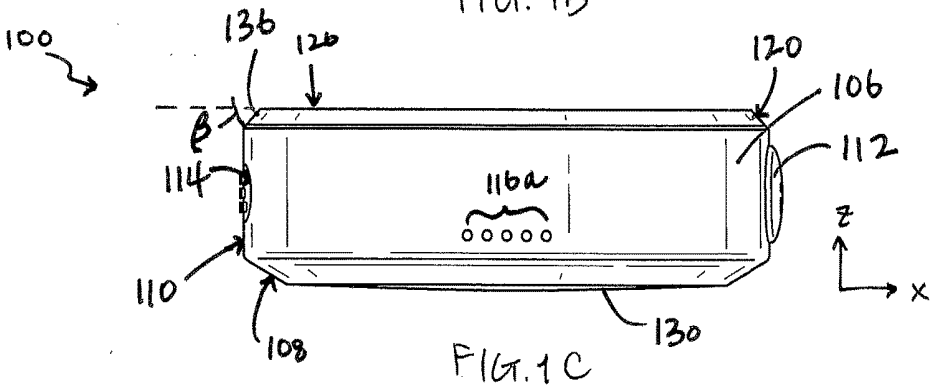

FIG. 1C

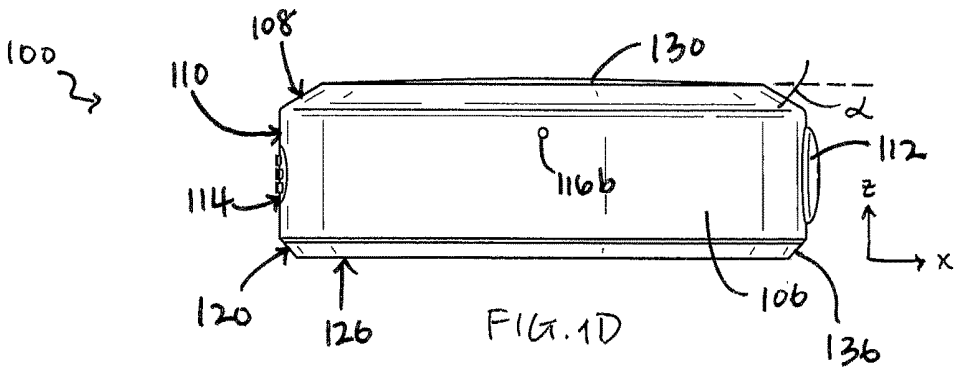

FIG. 1D

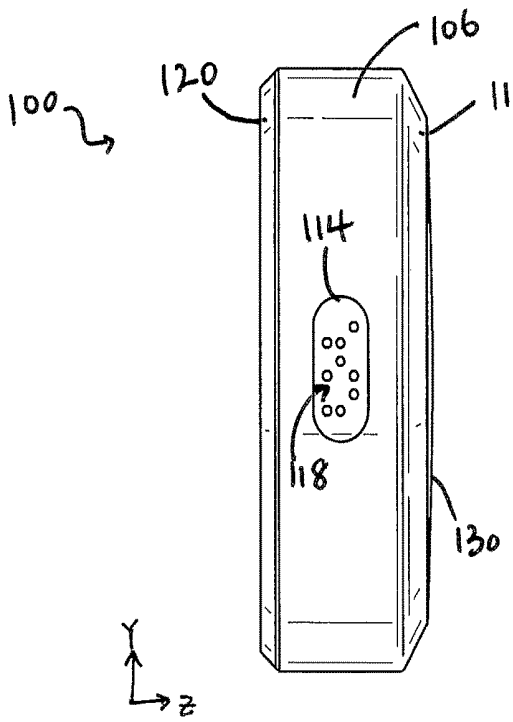

FIG. 1E

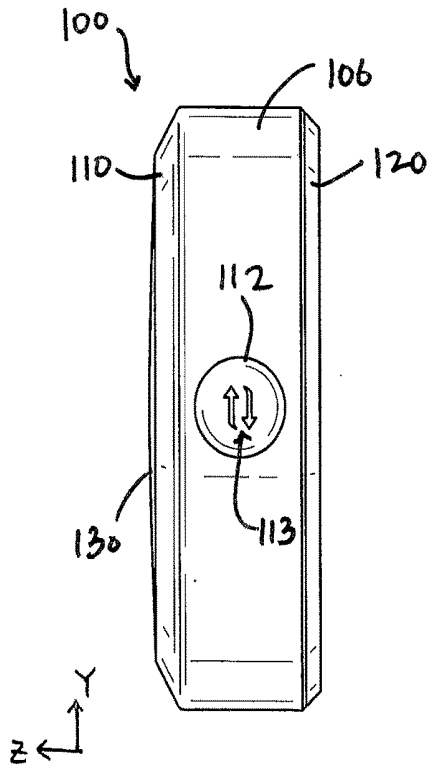

FIG. 1F

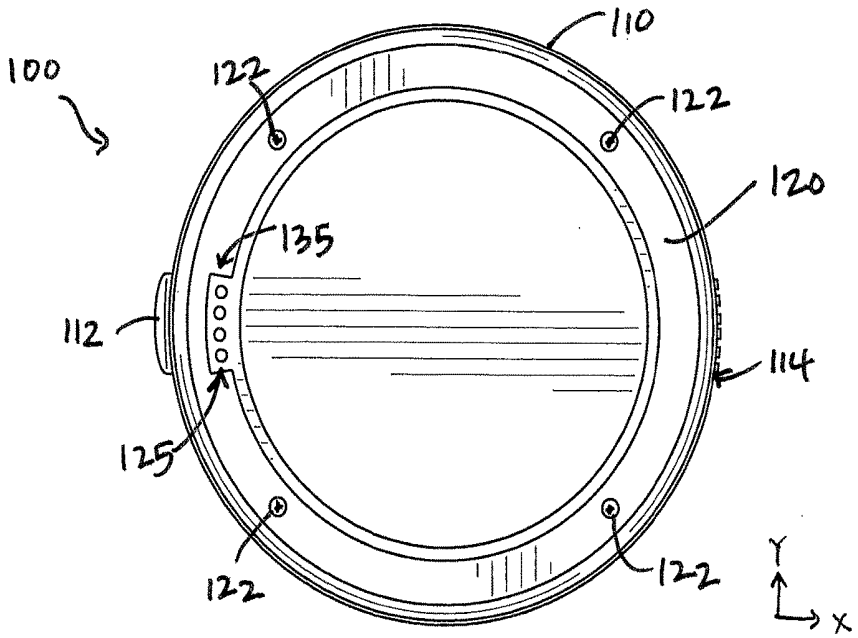

FIG. 1G

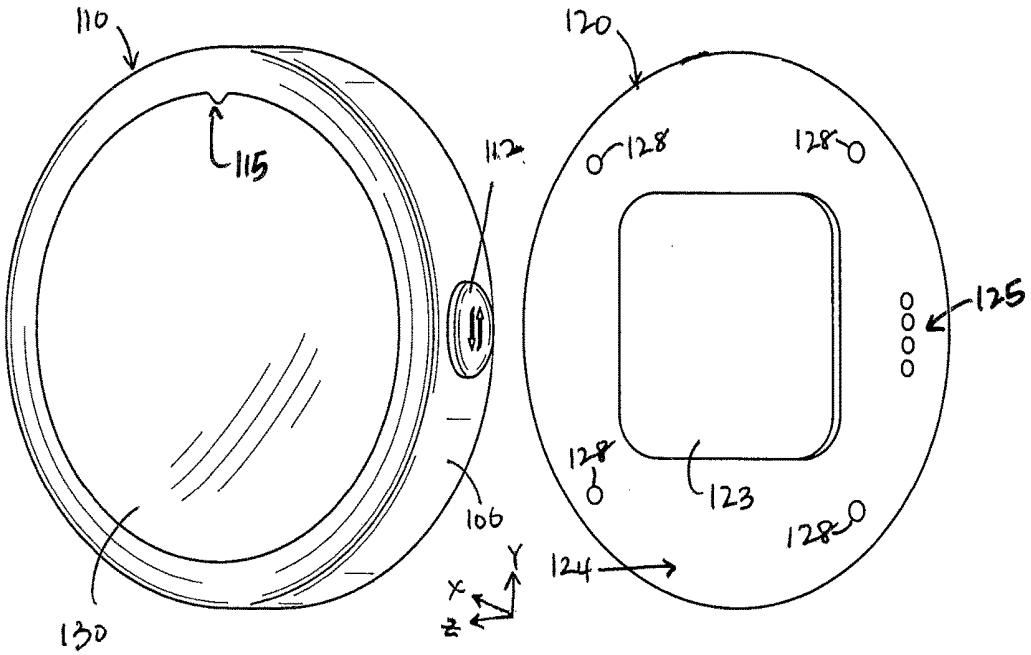
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FIG. 1H

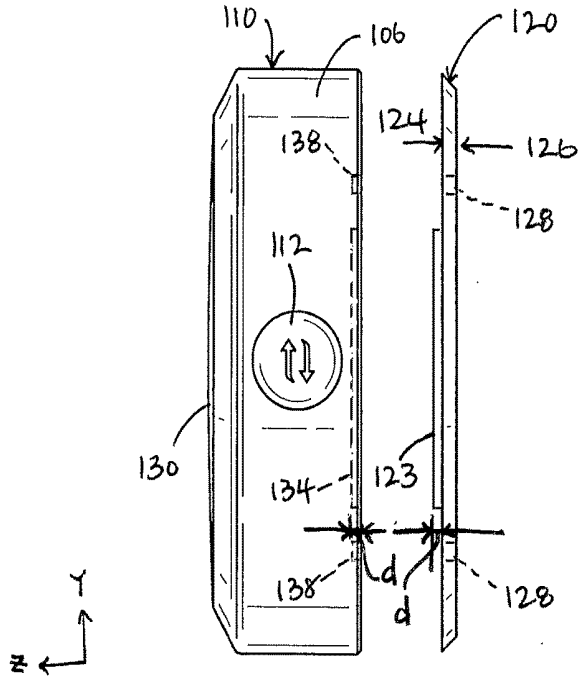
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FIG. 1J

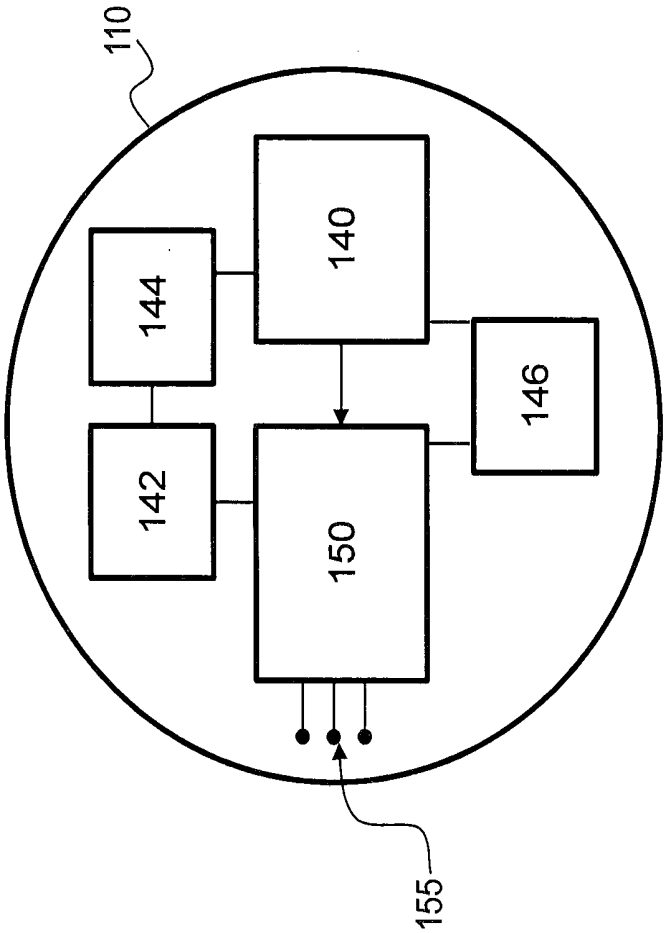

FIG. 1K

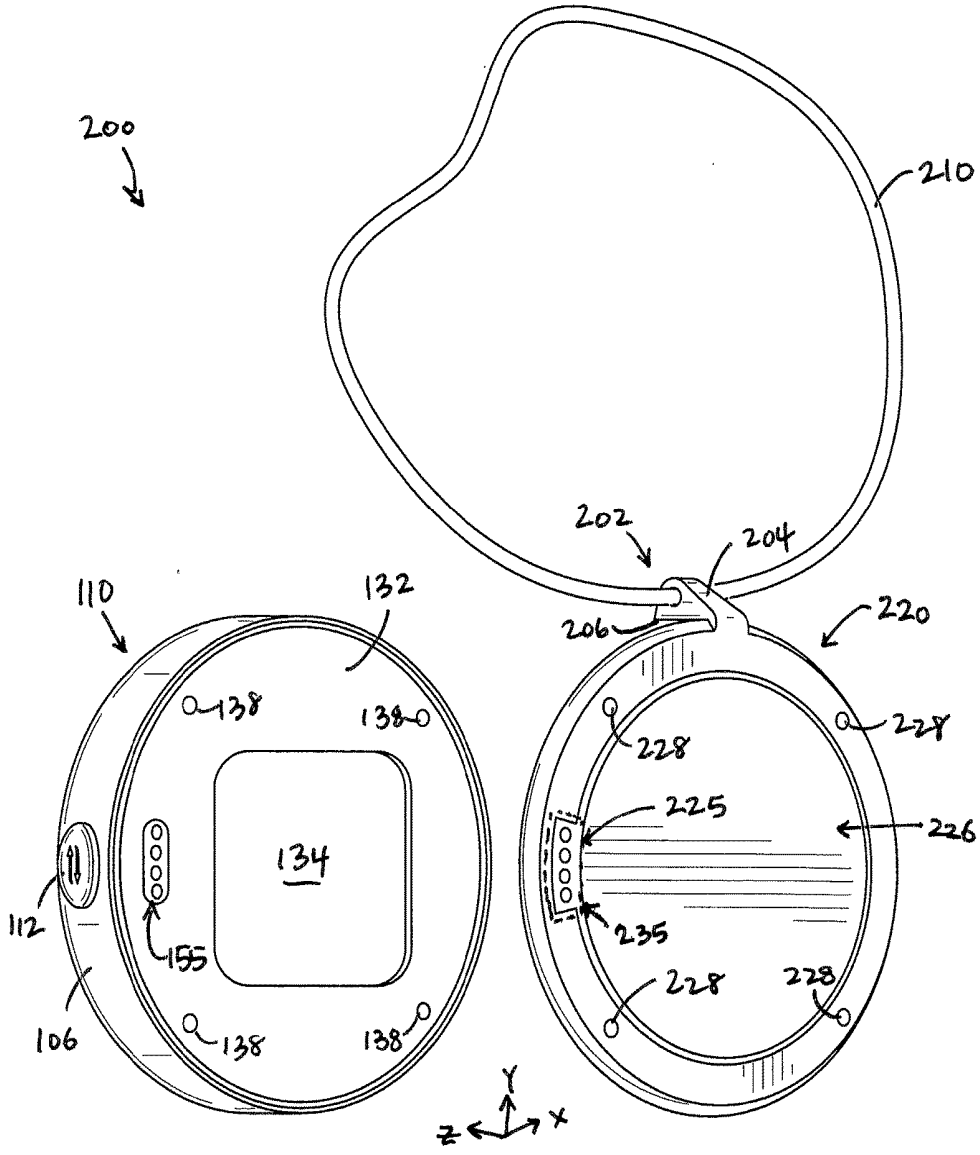
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FIG. 2A

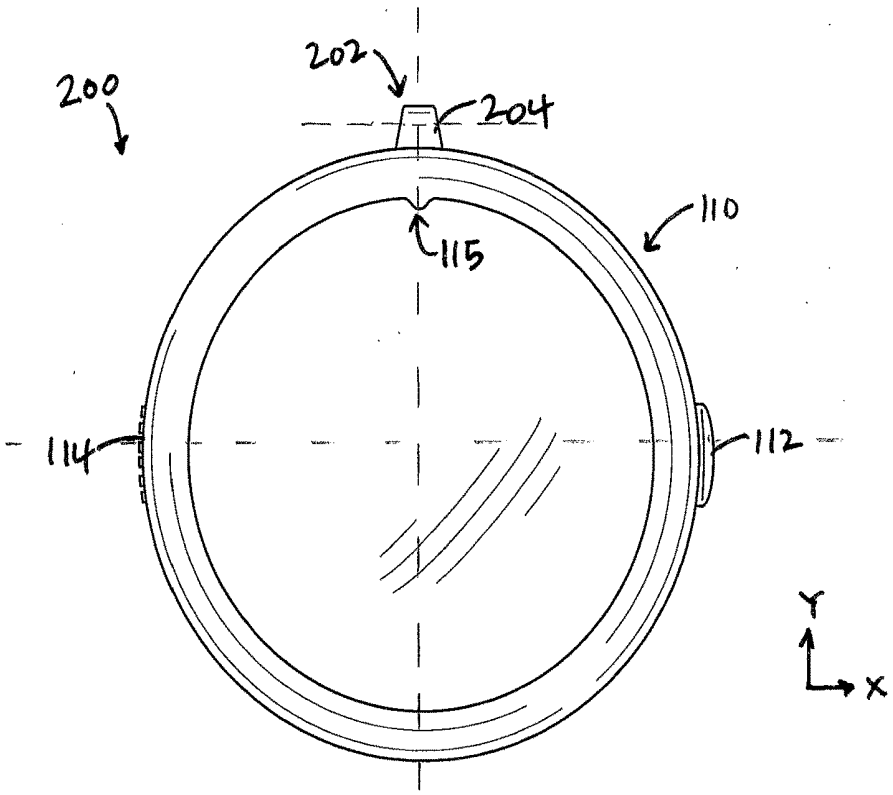

FIG. 2B

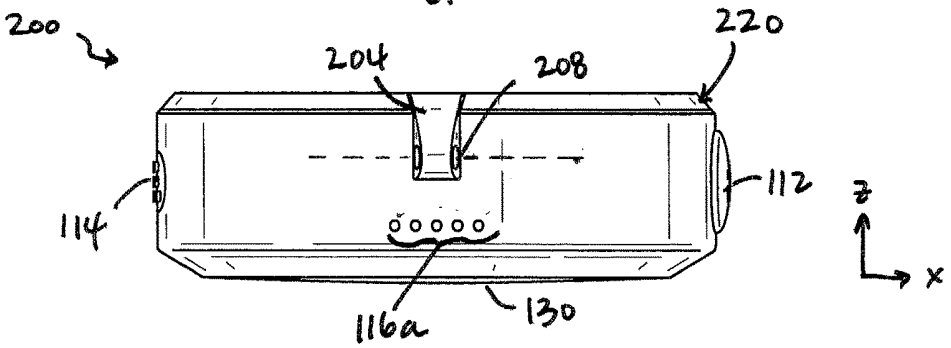

FIG. 2C

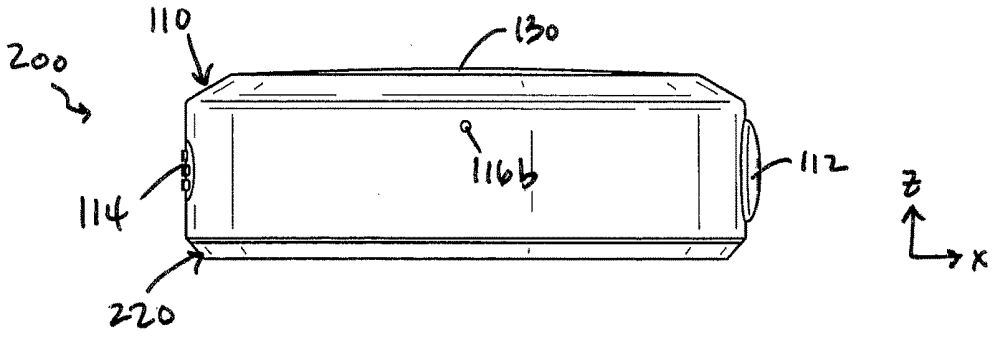

FIG. 2D

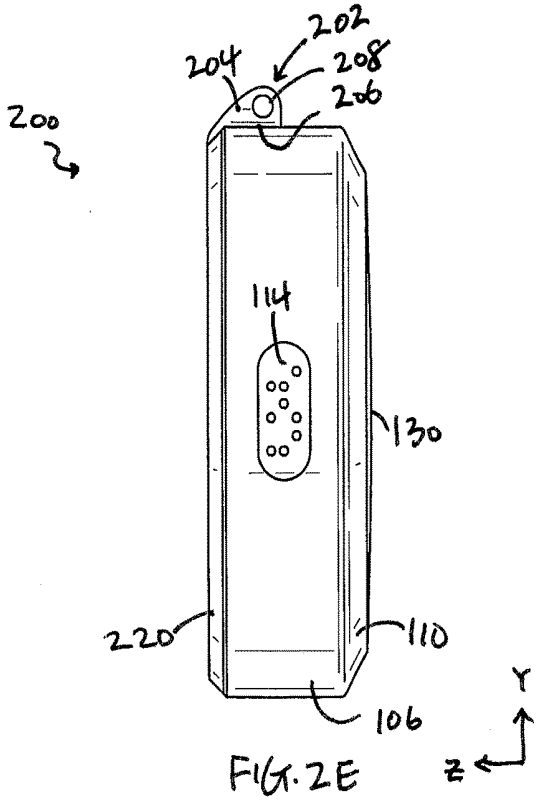

FIG. 2E

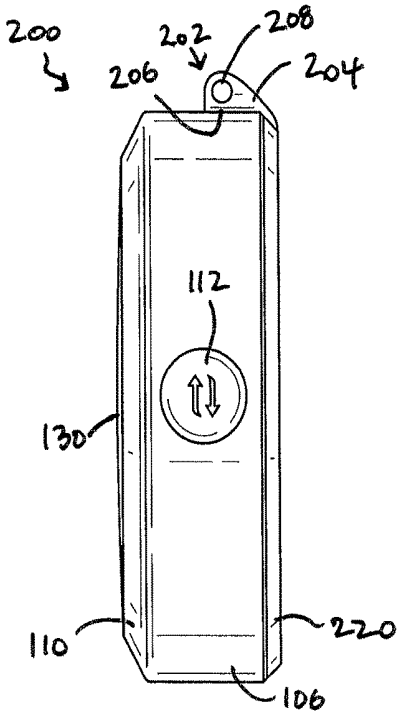

FIG. 2F

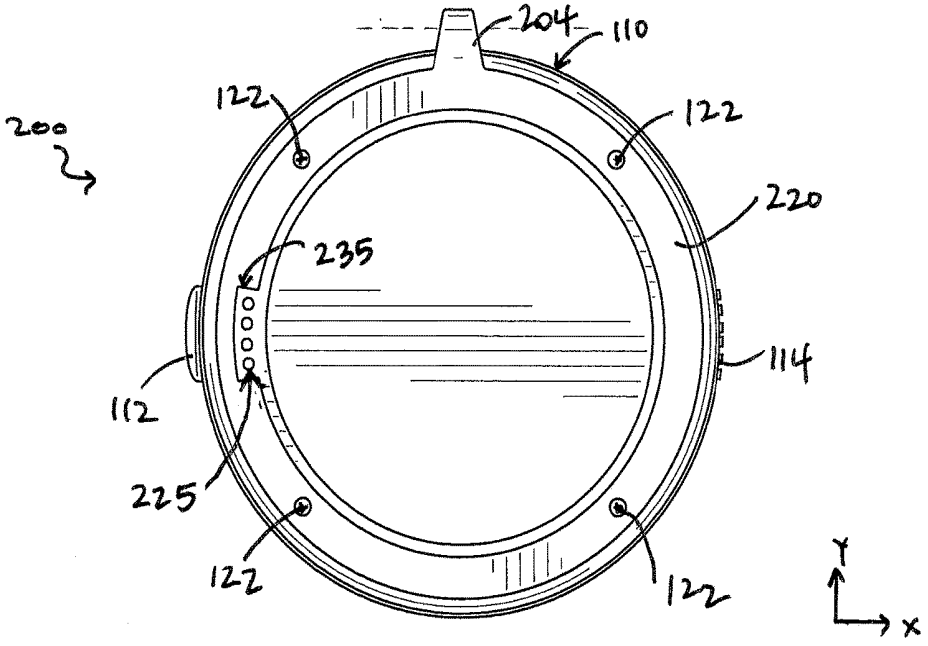

FIG. 2G

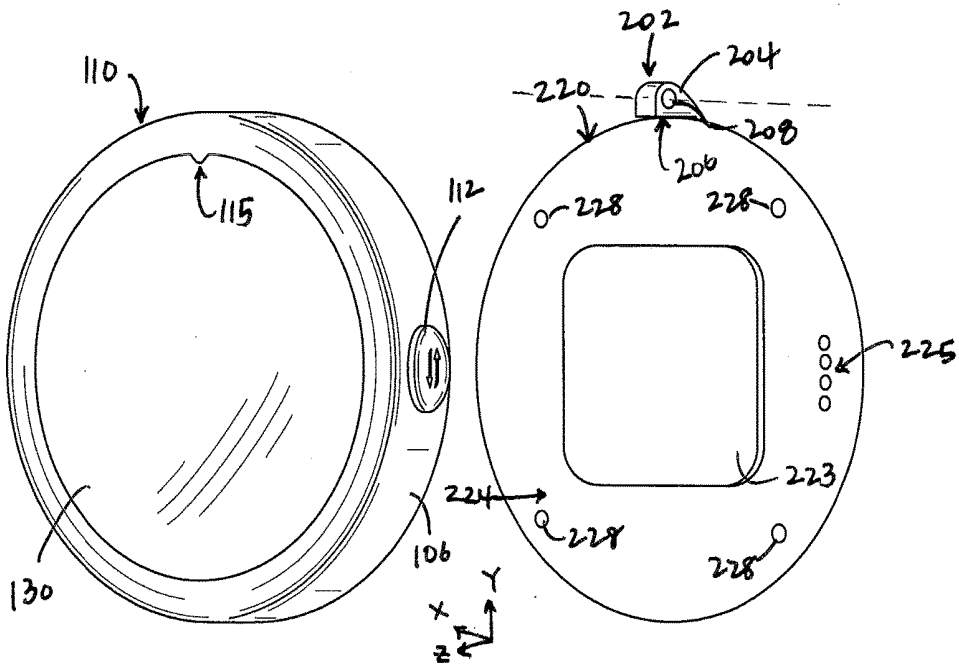
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FIG. 2H

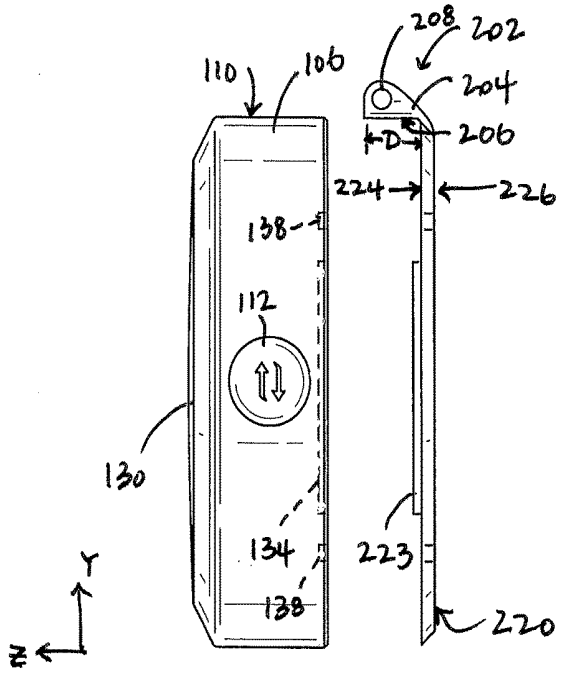
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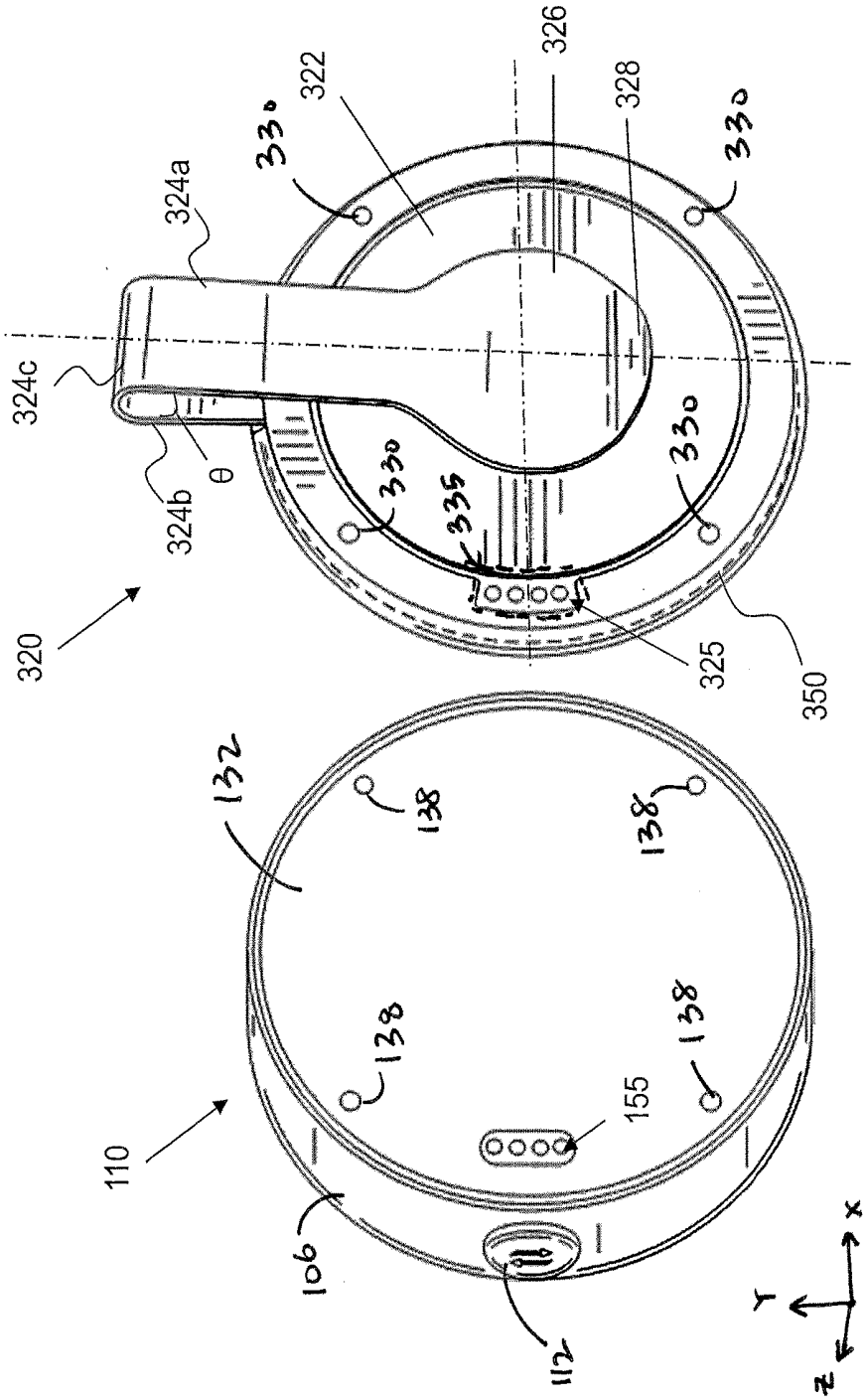
FIG. 2I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324a
324c
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324b
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X
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FIG. 3A

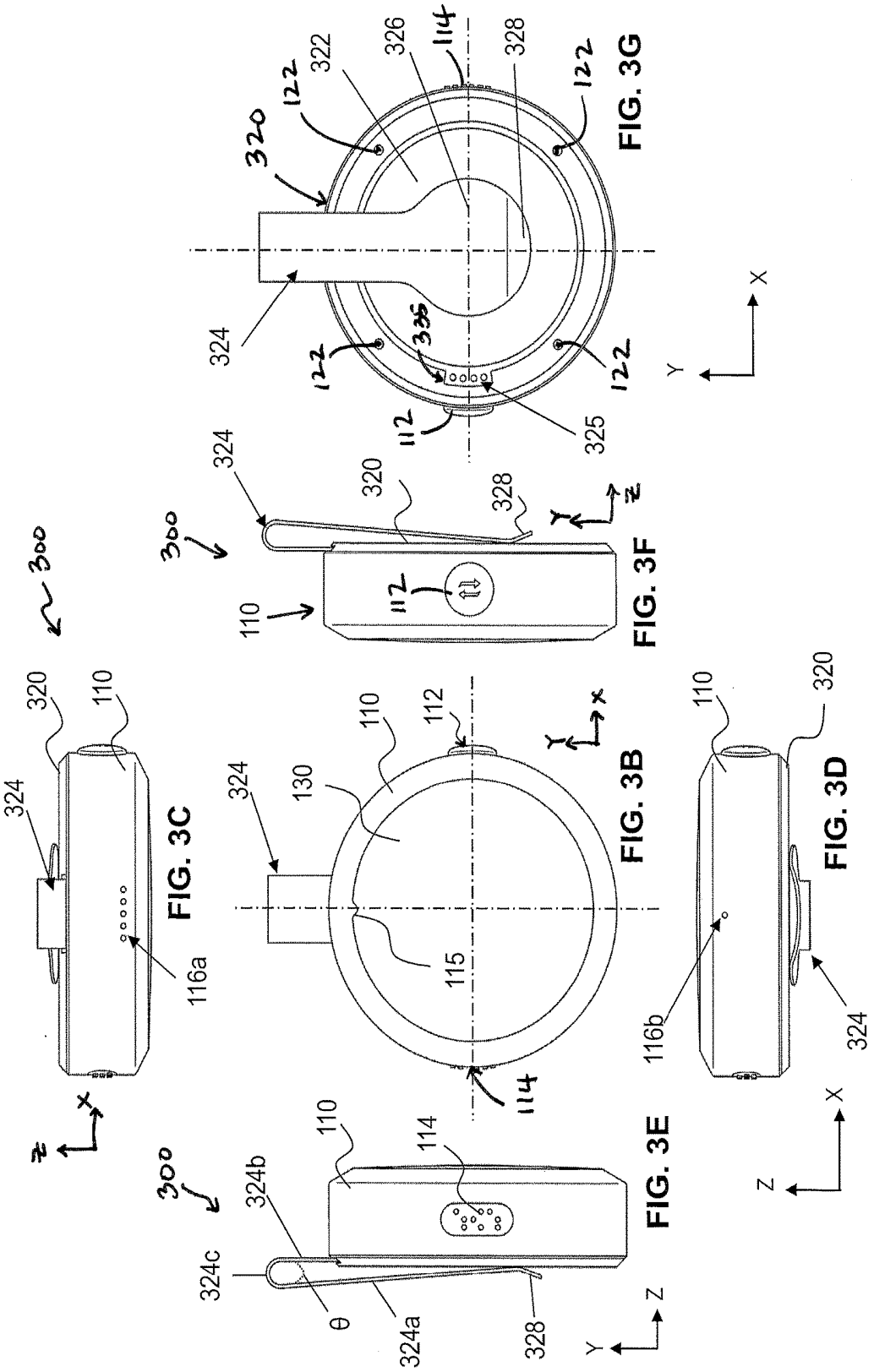
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FIG. 3C
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FIG. 3F
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FIG. 3G
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FIG. 3D
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FIG. 3E

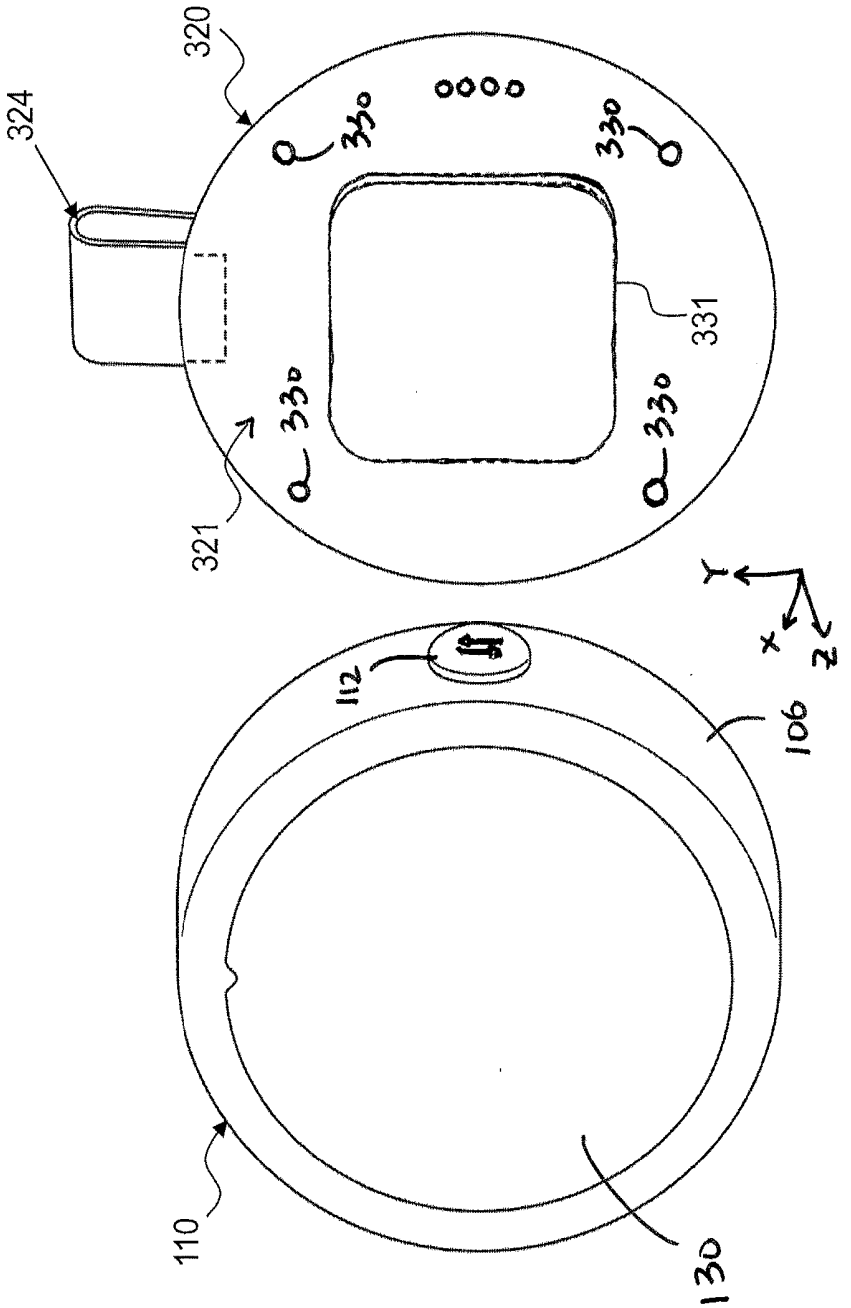

FIG. 3H

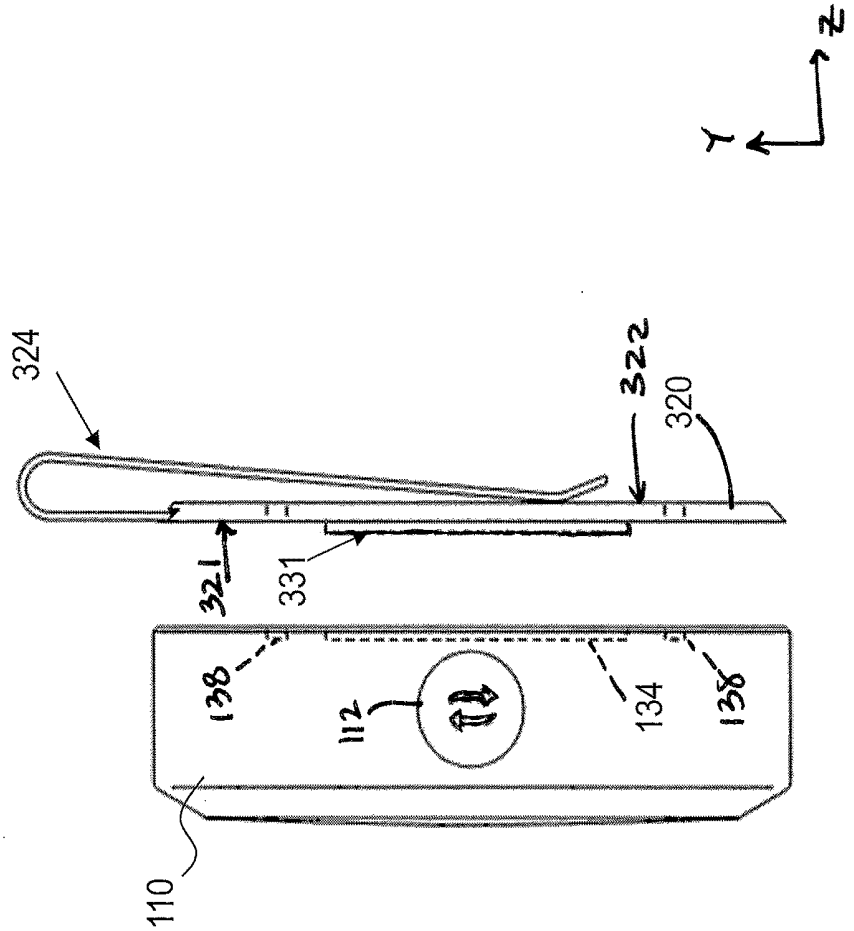

FIG. 3I

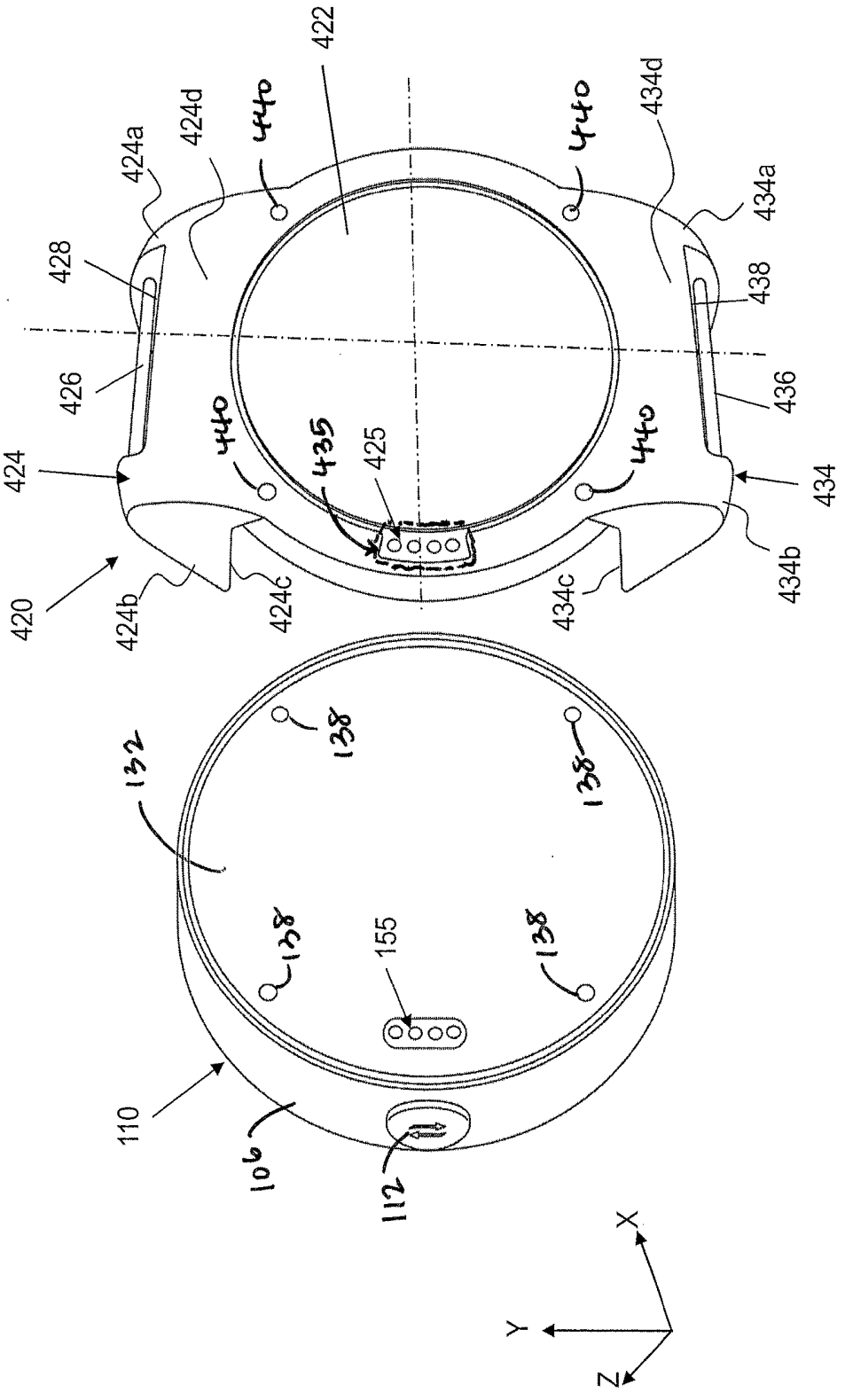
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FIG. 4A

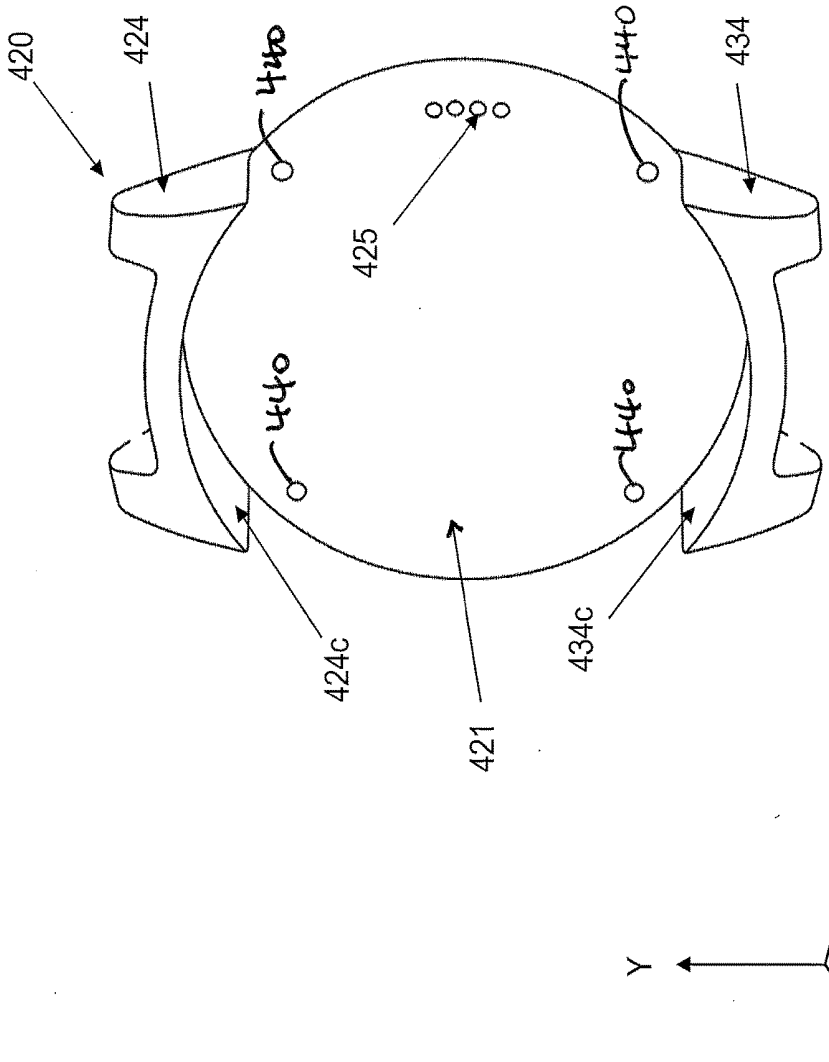
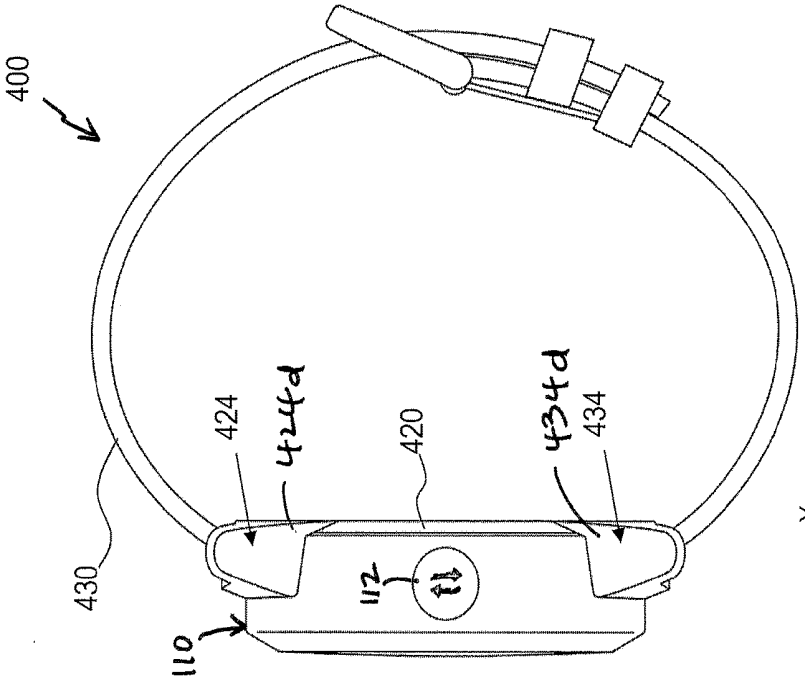


FIG. 4B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434d
434
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110
Y
Z

FIG. 4D

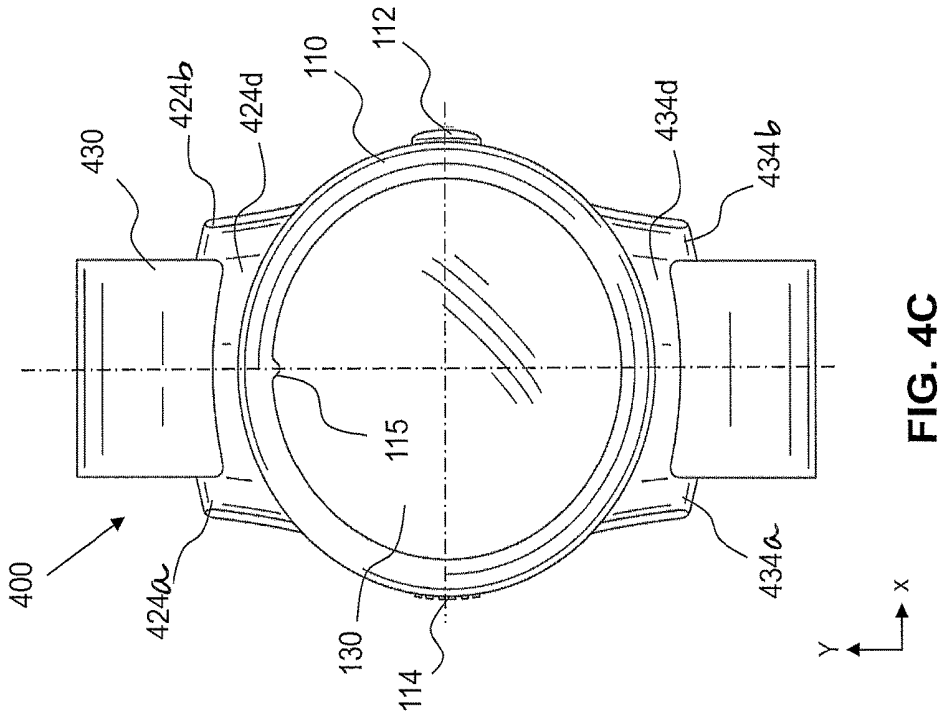
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FIG. 4C

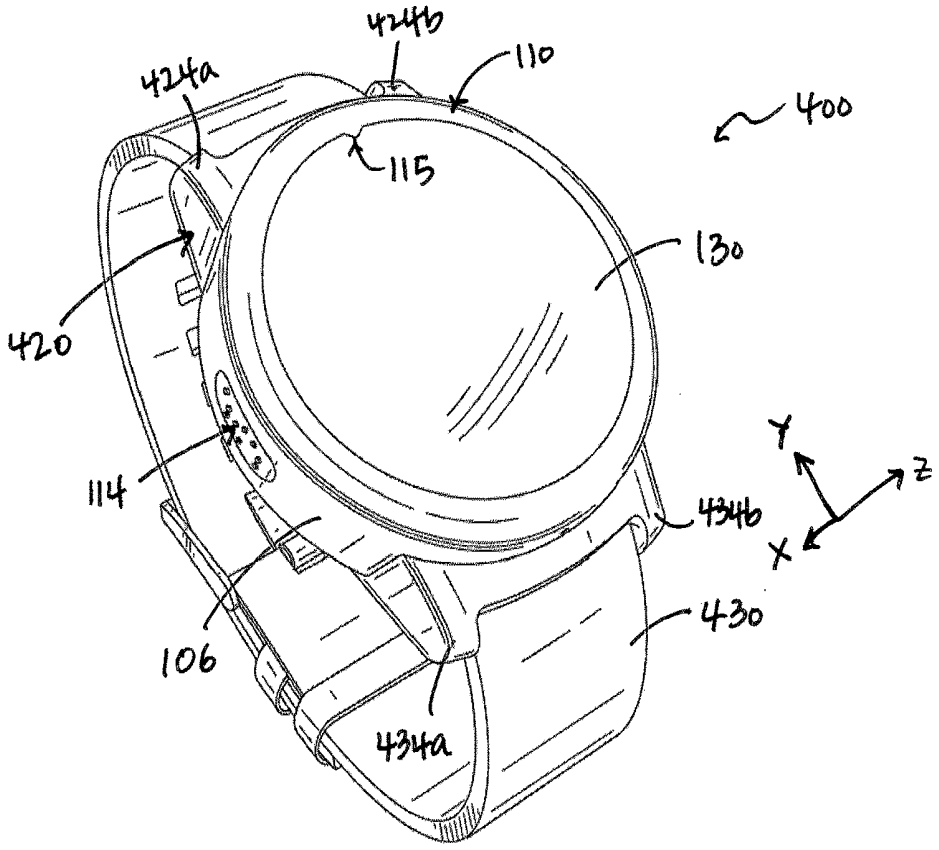
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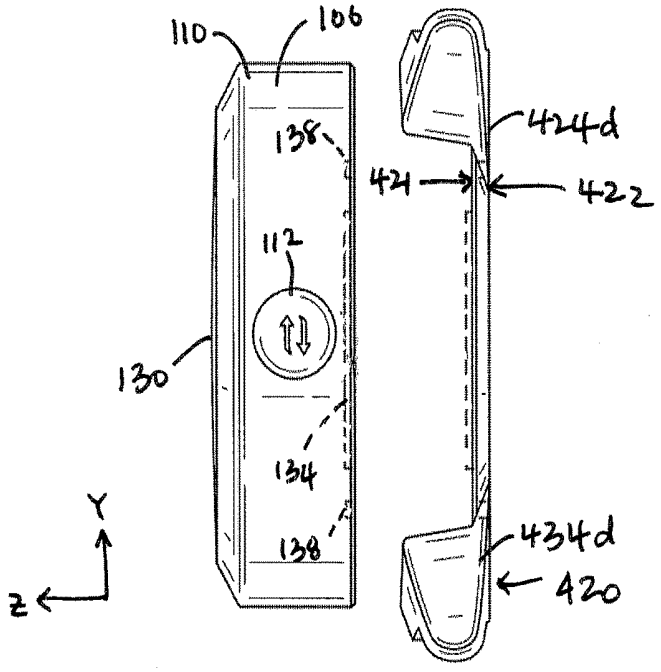
FIG. 4E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434d
420
Y
Z

FIG. 4G

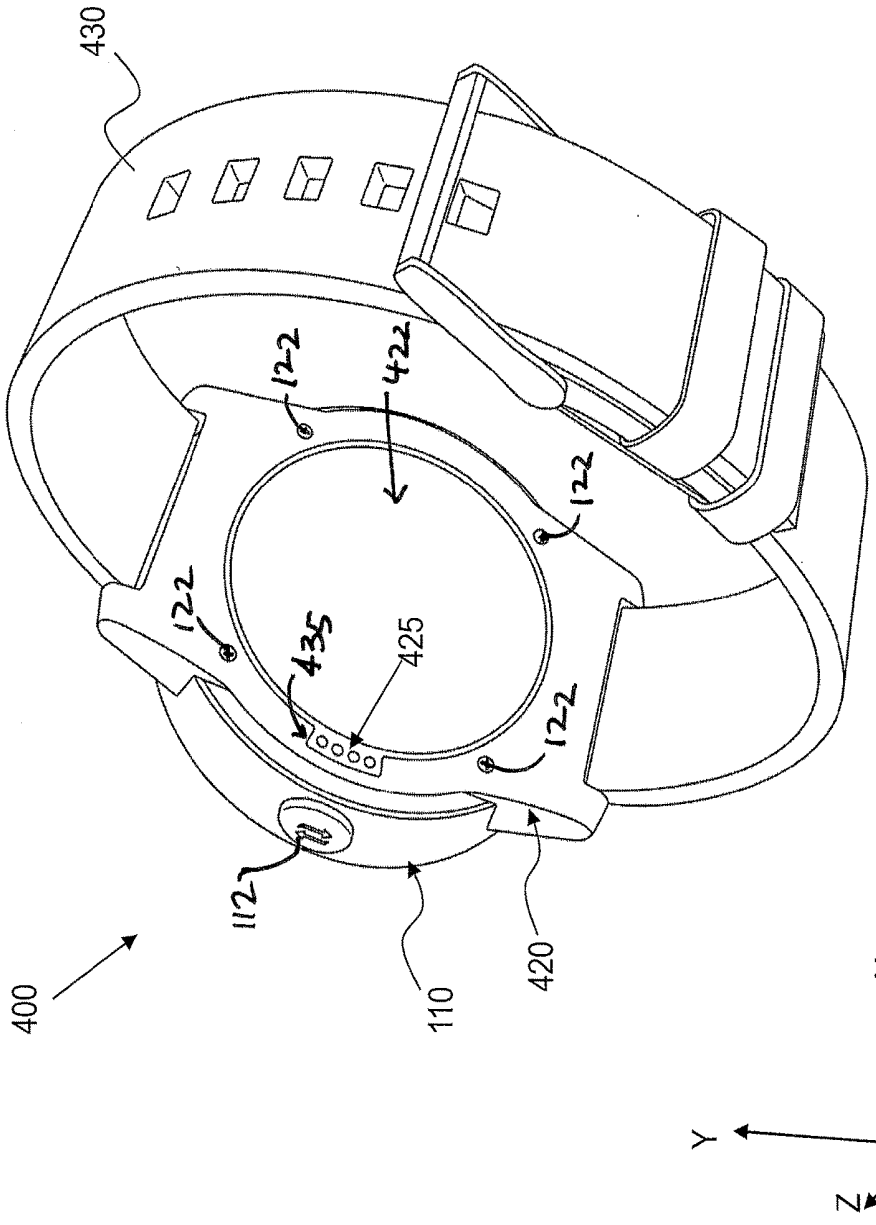

FIG. 4F

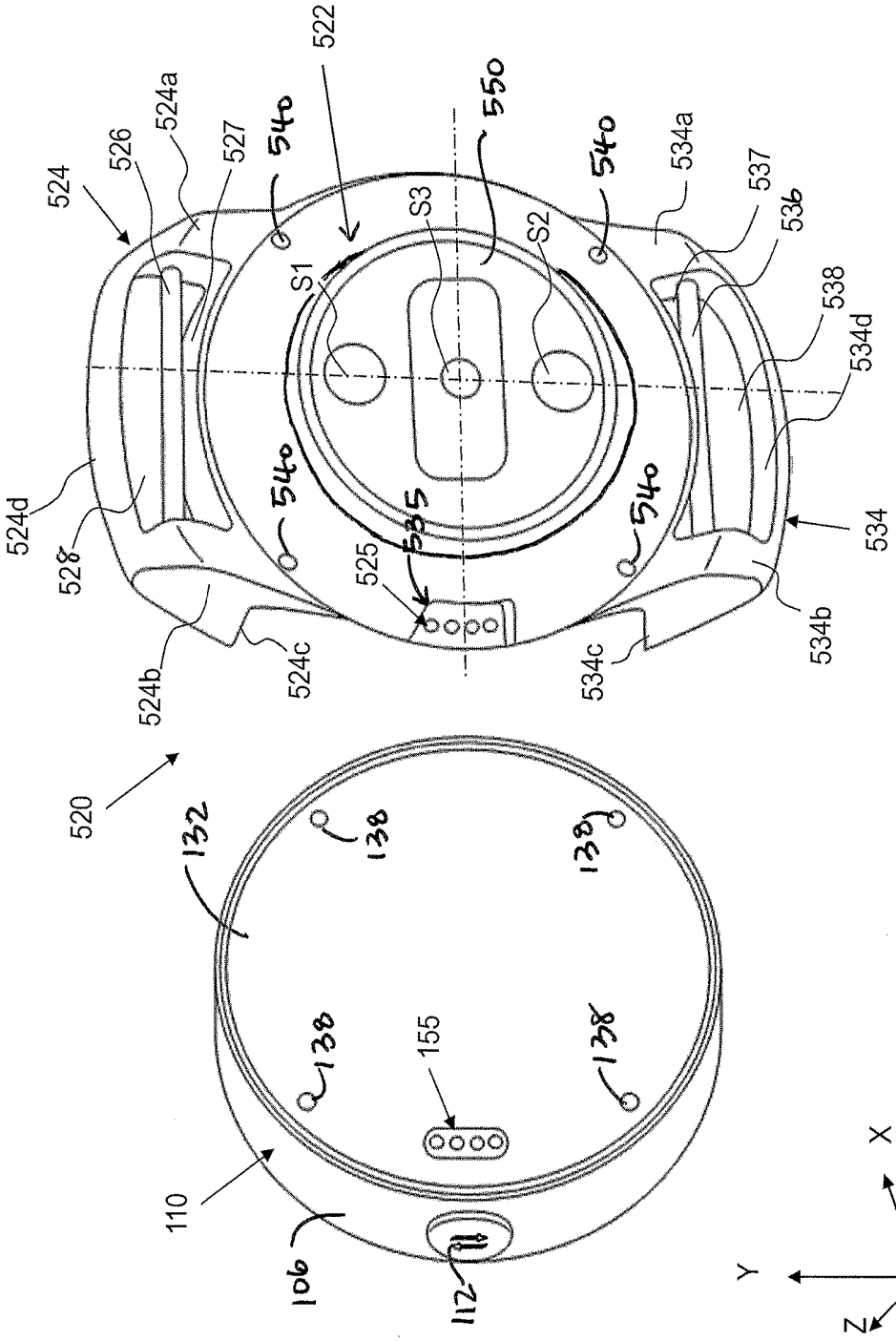
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FIG. 5A

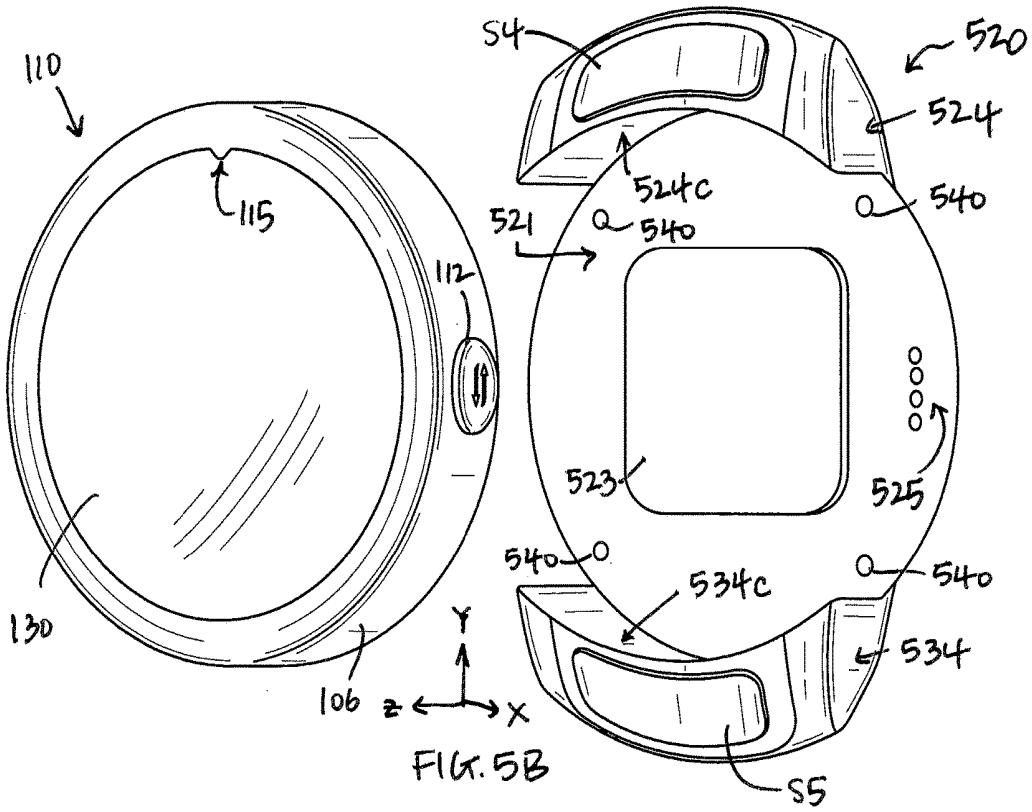
110
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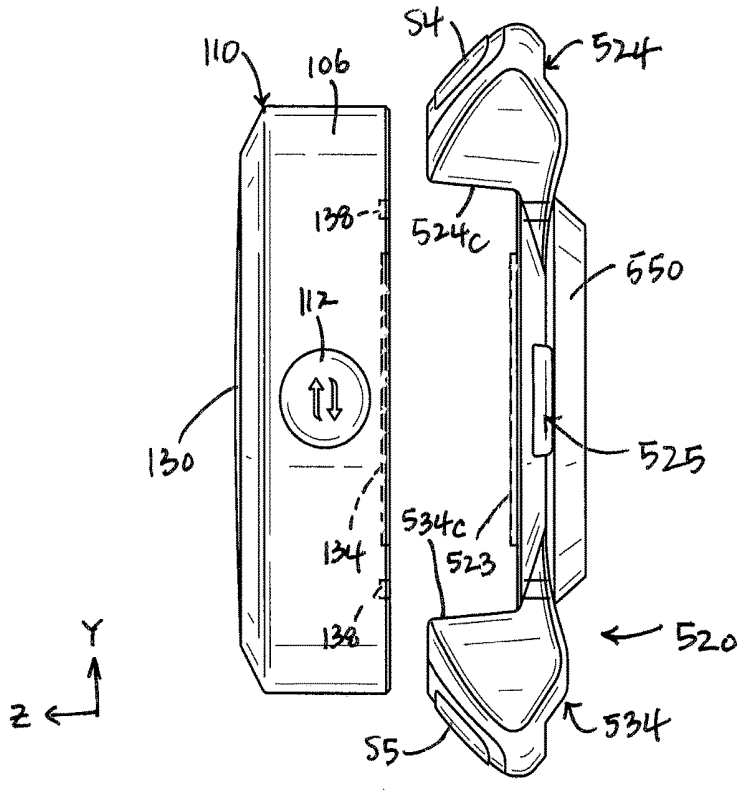
FIG. 5B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Y
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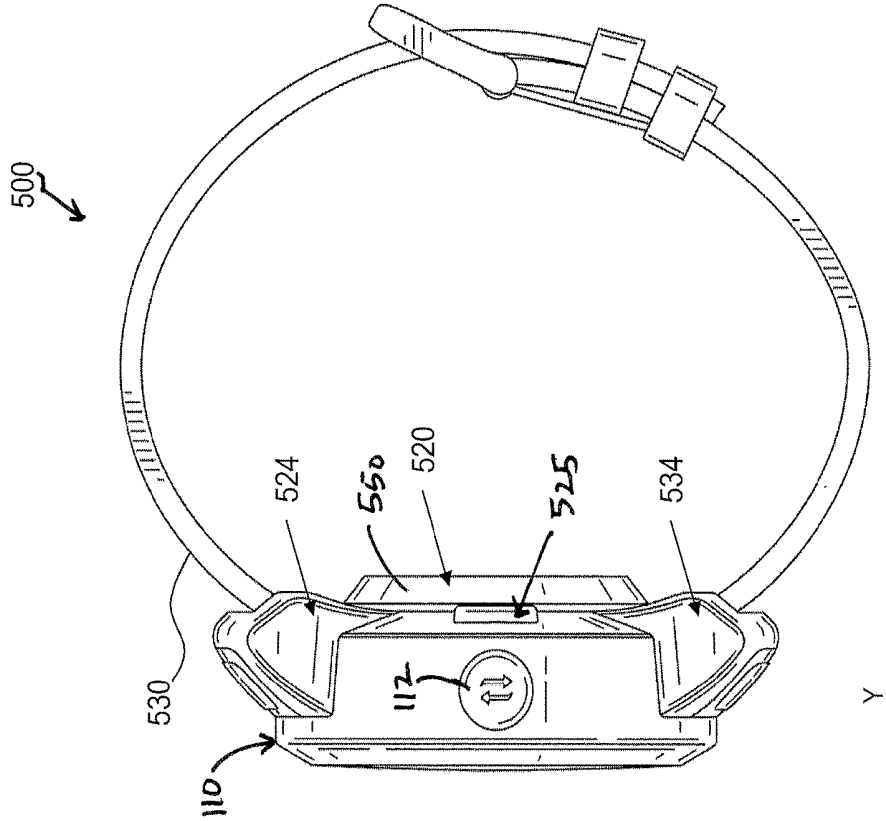
FIG. 5G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Y
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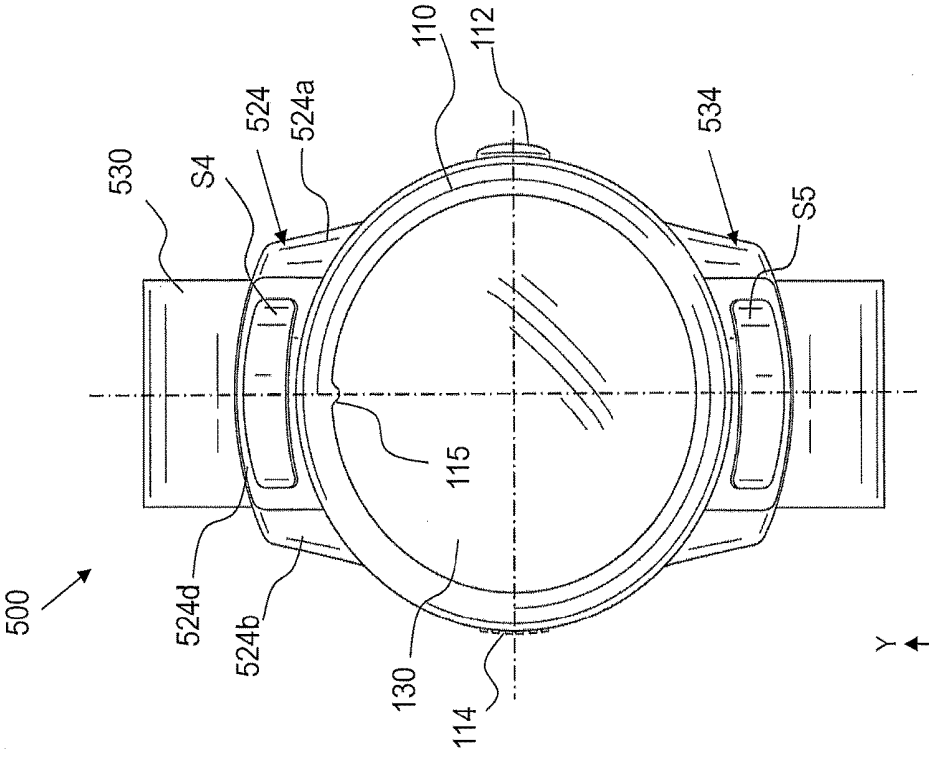
FIG. 5D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S5
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X
Y

FIG. 5C

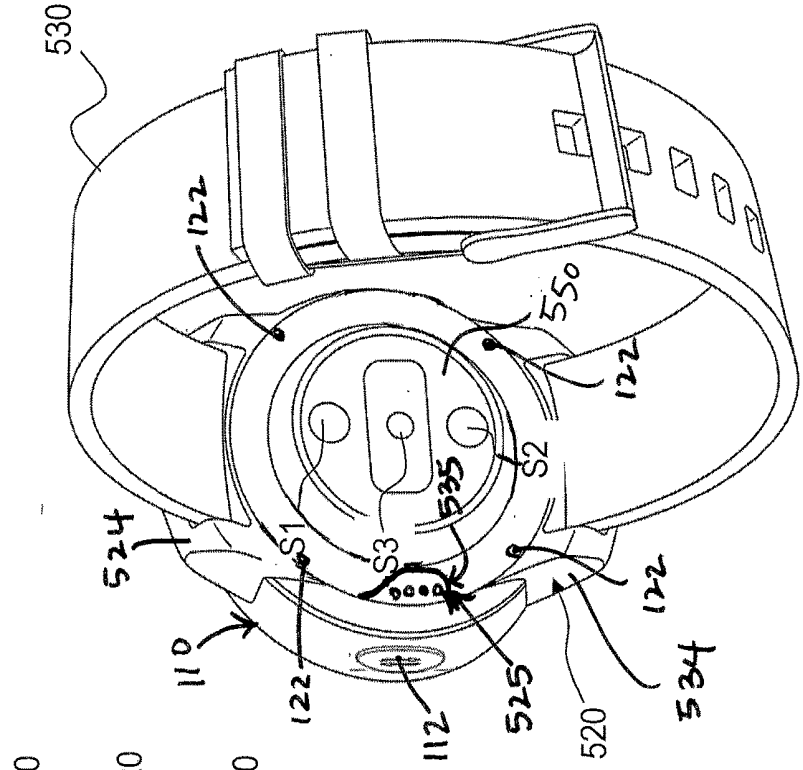
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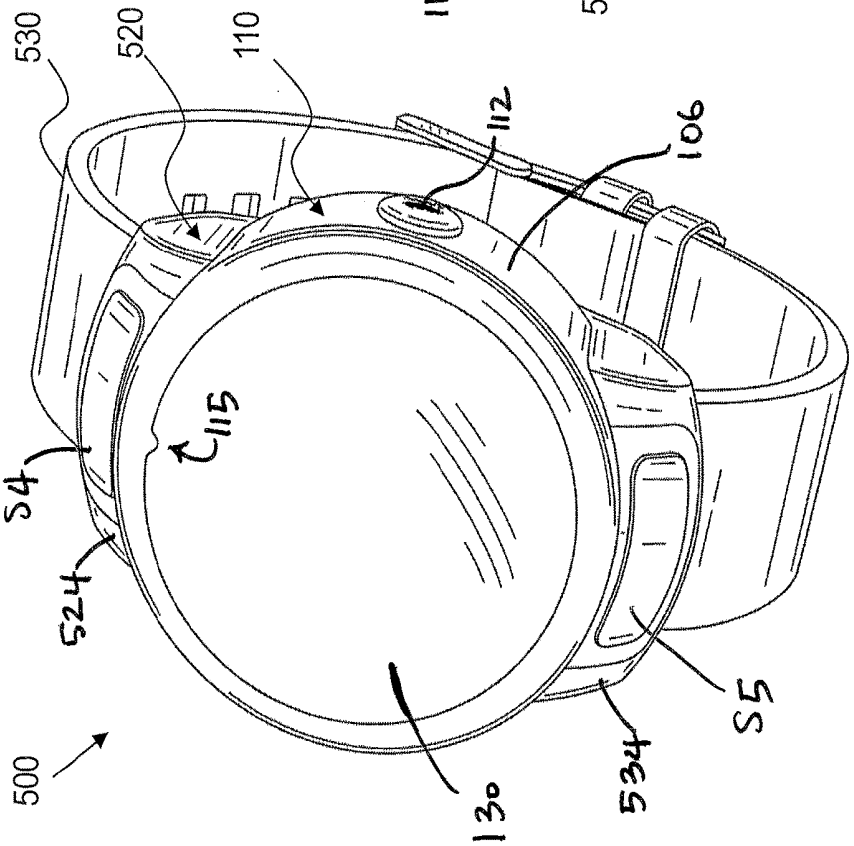
FIG. 5F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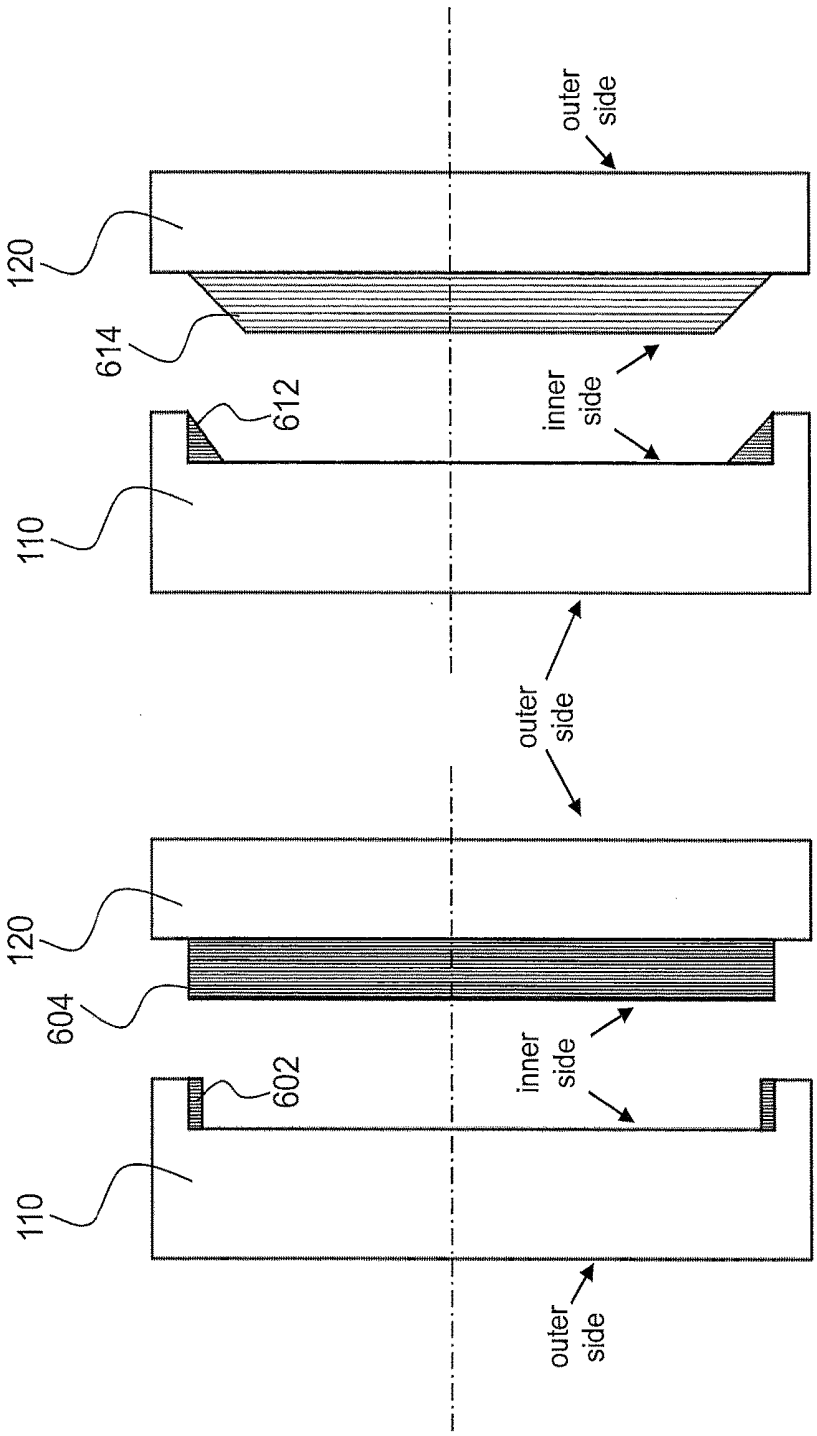
534
S5

FIG. 5E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614
612
110
outer side
inner side
outer side
120
604
602
110
inner side
outer side
Y
Z
Y
Z

FIG. 6A

FIG. 6B

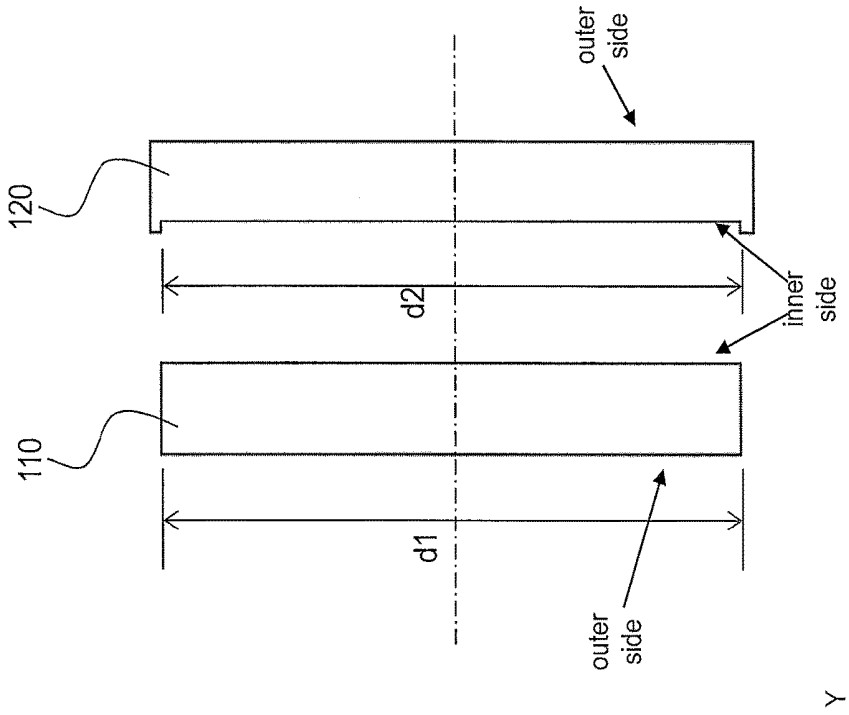

FIG. 7

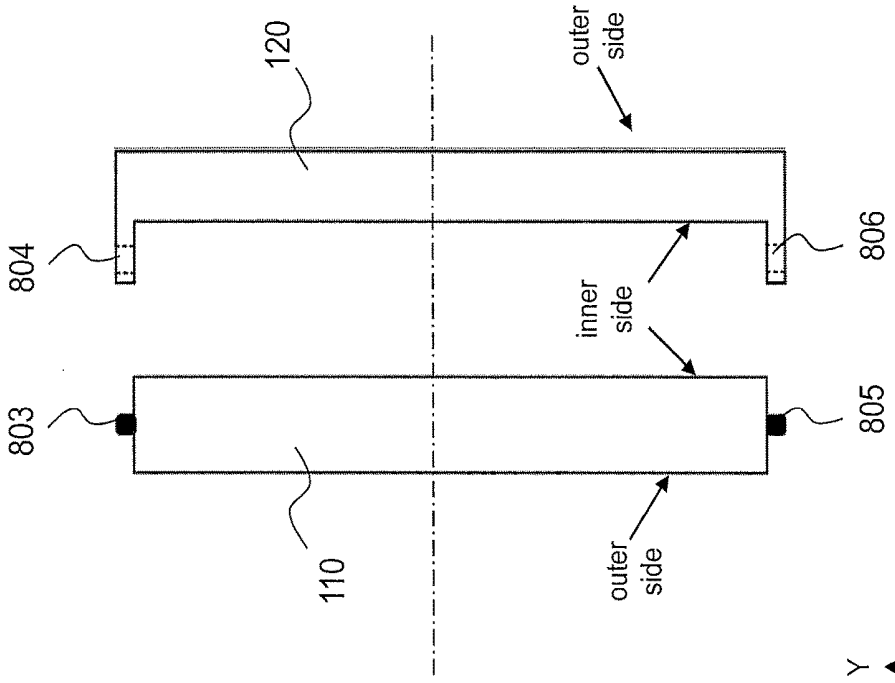

FIG. 8

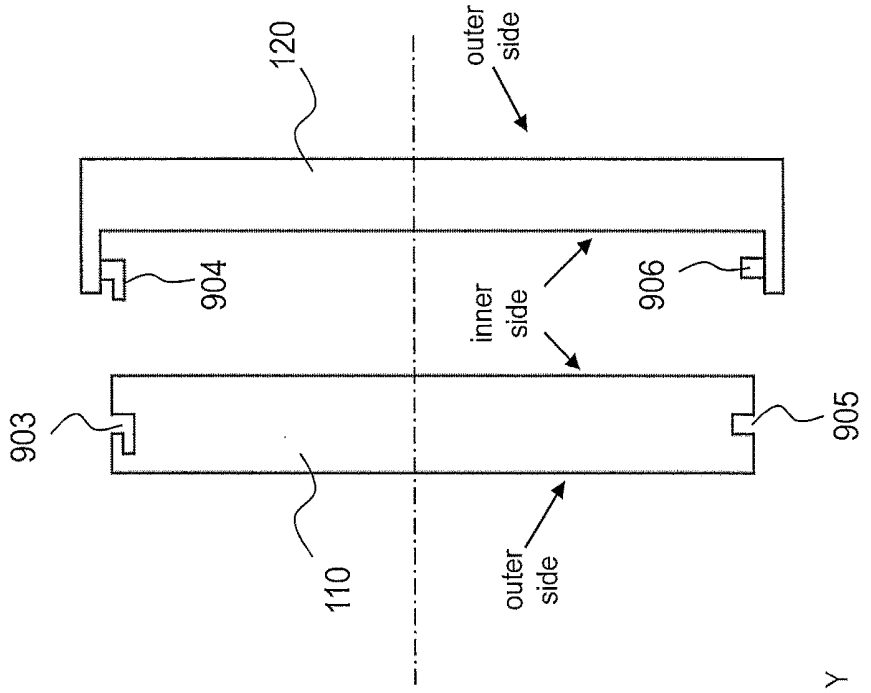

FIG. 9

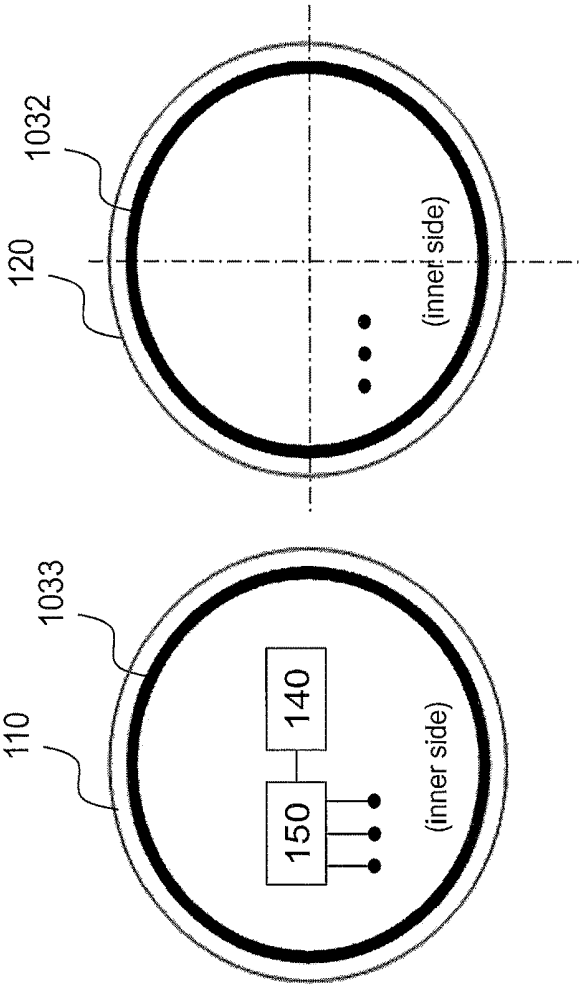

FIG. 10B

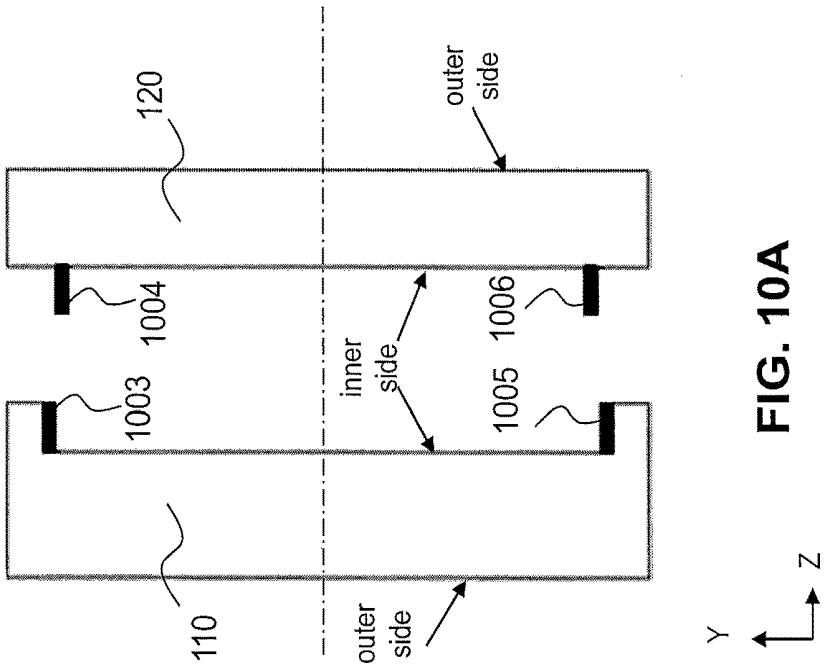

FIG. 10A

INTERCHANGEABLE WEARABLE DEVICE

BACKGROUND

Field

[0001] This disclosure relates generally to a wearable device. More particularly, the present disclosure relates to a wearable device and attachments, as well as communication link between the wearable device and other devices.

Description of the Related Art

[0002] Some people wear electronic devices wrapped around their wrist or arm, much like a bracelet. Alternatively, some electronic devices may be carried in a pocket or purse, or worn on another part of a person, e.g., on a piece of clothing. Such electronic devices may include features relating to a watch (i.e., telling time of day), a fitness or an activity tracker (e.g., number of steps walked, sleep pattern, etc.) or other health monitoring devices, including sensors, and are sometimes also referred to as smart watches. Generally, users are able to download, communicate with, and/or transmit data collected by their electronic device to another device, such as a smart phone, a laptop, or computer.

SUMMARY

[0003] According to one aspect of this disclosure, there is provided a wearable device. The wearable device includes a device case that has: at least one measurement device and a processor for processing measurements collected by the measurement device that are enclosed within the case, and a display or screen on a front of the device case for displaying data corresponding to measurements measured by the at least one measurement device. The device case also has a first button provided on one side of the device case, the first button having a raised, tactile portion thereon, and a second button provided on an opposite side of the device case, relative to the first button. The first and second buttons are configured to implement a function or an action via the processor when pressed by a user. The device case also has an electrical connector portion provided on a back of the device case that is used to establish an electrical connection between the processor and an external device such that the processor and the external device are configured for communication and measurements that are collected by the at least one measurement device and processed by the processor are communicated to the external device. The wearable device also includes an interchangeable accessory cover removably attached to the device case. The accessory cover is configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto.

[0004] Another aspect of this disclosure provides a system comprising: a wearable device including: a device case that has: at least one measurement device and a processor for processing measurements collected by the measurement device that are enclosed within the case, and a display or screen on a front of the device case for displaying data corresponding to measurements measured by the at least one measurement device. The device case also has a first button provided on one side of the device case, the first button having a raised, tactile portion thereon, and a second button provided on an opposite side of the device case, relative to the first button. The first and second buttons are configured to implement a function or an action via the processor when pressed by a user. The device case also has an electrical connector portion provided on a back of the device case that is used to establish an electrical connection between the processor and an external device such that the processor and the external device are configured for communication and measurements that are collected by the at least one measurement device and processed by the processor are communicated to the external device. The wearable device also includes a first interchangeable accessory cover and a second interchangeable accessory cover, each adapted to be removably attached to the device case and each of the first and second interchangeable accessory covers are configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto. The second interchangeable accessory cover has a different configuration than the first interchangeable accessory cover.

[0005] Yet another aspect of this disclosure provides an interchangeable accessory cover for removable attachment to a wearable device, the wearable device having: a housing that contains at least one measurement device and a processor for processing measurements collected by the measurement device, and a display or screen on a front of the housing for displaying data corresponding to measurements measured by the at least one measurement device. The accessory cover has a front portion and a back portion, and an electrical connector portion with electrical contact points that are accessible via the back portion upon attachment to the wearable device. The electrical connector portion is configured to establish an electrical connection between the processor of the wearable device and an external device such that the processor and the external device are configured for communication and measurements that are collected by the at least one measurement device and processed by the processor are communicated to the external device via the interchangeable accessory cover.

[0006] The forgoing general description of the illustrative implementations and the following detailed description thereof are merely exemplary aspects of the teachings of this disclosure, and are not restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate one or more embodiments and, together with the description, explain these embodiments. The accompanying drawings have not necessarily been drawn to scale. Any values dimensions illustrated in the accompanying graphs and figures are for illustration purposes only and may or may not represent actual or preferred values or dimensions. Where applicable, some or all features may not be illustrated to assist in the description of underlying features. In the drawings:

[0008] FIG. **1**A is a front side perspective view of a wearable device in accordance with an embodiment of this disclosure;

[0009] FIGS. **1**B, **1**C, **1**D, **1**E, **1**F, and **1**G are front, top, bottom, first (left) side, second (right) side, and back views, respectively, of the wearable device of FIG. **1**A;

[0010] FIGS. **1**H, II, and IJ are exploded back side, front side, and second (right) side views, respectively, of the device case and the interchangeable accessory cover of the wearable device of FIG. **1**A;

[0011] FIG. **1**K is a schematic diagram of features contained within the device case of the wearable device of FIG. **1**A according to an embodiment;

[0012] FIG. **2**A is an exploded, back side angled view of a second interchangeable accessory cover and a device case of a wearable device according to another embodiment of this disclosure;

[0013] FIGS. **2**B, **2**C, **2**D, **2**E, **2**F, and **2**G illustrates front, top, bottom, first side, second side, and back views, respectively, of the wearable device of FIG. **2**A;

[0014] FIGS. **2**H and **2**I are exploded front side and second (right) side views, respectively, of the device case and the interchangeable accessory cover of the wearable device of FIG. **2**A;

[0015] FIG. **3**A is an exploded, back side angled view of a third interchangeable accessory cover and a device case of a wearable device in accordance with another embodiment of this disclosure;

[0016] FIGS. **3**B, **3**C, **3**D, **3**E, **3**F, and **3**G illustrates front, top, bottom, first side, second side, and back views, respectively, of the wearable device of FIG. **3**A;

[0017] FIGS. **3**H and **3**I are exploded front side and second (right) side views, respectively, of the device case and the interchangeable accessory cover of the wearable device of FIG. **3**A;

[0018] FIG. **4**A is an exploded, back side angled view of a fourth interchangeable accessory and a device case of a wearable device according to yet another embodiment of this disclosure;

[0019] FIG. **4**B is a front, angled view of the fourth interchangeable accessory of FIG. **4**A;

[0020] FIGS. **4**C, **4**D, **4**E and **4**F illustrate front, second (right) side, front perspective, and back perspective views, respectively, of the wearable device of FIG. **4**A;

[0021] FIG. **4**G is an exploded second (right) side view of a device case and the interchangeable accessory cover of the wearable device of FIG. **4**A;

[0022] FIG. **5**A an exploded, back side angled view of a fifth interchangeable accessory cover and a device case of a wearable device according to still yet another embodiment of this disclosure;

[0023] FIG. **5**B is an exploded, front side angled view of the fourth interchangeable accessory and device case of FIG. **4**A;

[0024] FIGS. **5**C, **5**D, **5**E and **5**F illustrate front, second (right) side, front perspective, and back perspective views, respectively, of the wearable device of FIG. **5**A;

[0025] FIG. **5**G is an exploded second (right) side view of a device case and the interchangeable accessory cover of the wearable device of FIG. **5**A;

[0026] FIGS. **6**A and **6**B illustrates a schematic representation of exploded, right side views of the device case and an interchangeable accessory cover having cooperative threaded attachment mechanisms for attachment, according to embodiments of the present disclosure;

[0027] FIG. **7** illustrates a schematic representation of an exploded, right side view of the device case and an interchangeable accessory cover including a snap fit attachment mechanism according to another embodiment of the present disclosure;

[0028] FIG. **8** illustrates a schematic representation of an exploded, right side view of a retractable pin attachment mechanism for the device case and an interchangeable accessory cover according to yet another embodiment of the present disclosure;

[0029] FIG. **9** illustrates a schematic representation of an exploded, right side view of the device case and an interchangeable accessory cover including clip based attachment mechanism for attachment according to still yet another embodiment of the present disclosure; and

[0030] FIGS. **10**A and **10**B illustrates a schematic representation of exploded, right side views of the device case and a interchangeable accessory cover having magnetic attachments according to additional embodiment of the present disclosure.

DETAILED DESCRIPTION

[0031] The description set forth below in connection with the appended drawings is intended as a description of various embodiments of the disclosed subject matter and is not necessarily intended to represent the only embodiment (s). In certain instances, the description includes specific details for the purpose of providing an understanding of the disclosed embodiment(s). However, it will be apparent to those skilled in the art that the disclosed embodiment(s) may be practiced without those specific details. In some instances, well-known structures and components may be shown in block diagram form in order to avoid obscuring the concepts of the disclosed subject matter.

[0032] Reference throughout the specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with an embodiment is included in at least one embodiment of the subject matter disclosed. Thus, the appearance of the phrases "in one embodiment" or "in an embodiment" in various places throughout the specification is not necessarily referring to the same embodiment. Further, the particular features, structures or characteristics may be combined in any suitable manner in one or more embodiments. Further, it is intended that embodiments of the disclosed subject matter cover modifications and variations thereof.

[0033] It is to be understood that terms such as "left," "right," "top," "bottom," "front," "rear," "side," "height," "length," "width," "upper," "lower," "interior," "exterior," "inner," "outer," and the like that may be used herein merely describe points of reference and do not necessarily limit embodiments of the present disclosure to any particular orientation or configuration. Furthermore, terms such as "first," "second," "third," etc., merely identify one of a number of portions, components, steps, operations, functions, and/or points of reference as disclosed herein, and likewise do not necessarily limit embodiments of the present disclosure to any particular configuration or orientation, or any requirement that each number must be included.

[0034] FIGS. **1**A-**1**J illustrate multiple views of parts of a wearable device **100** according to an embodiment of this disclosure. In some instances, wearable device **100** may be referred to as a "smart case" or "smart watch" herein. For example, in accordance with an embodiment, the wearable device **100** is designed for measurement, diagnostic, and/or monitoring purposes with regards to lifestyle, activities, and health of a user (e.g., number of steps taken, heartrate and/or cardiac readings, location (GPS)). The wearable device **100** may be used to keep track of physical activities of a user or wearer such as a number of steps that a user has walked via, e.g., detected motion via an accelerometer, and then send

such activity data to an application that is associated with or provided on an external device (e.g., an application installed on a user's smart phone or mobile phone, or a computer, or a server) so that the user and/or other health professional is able to keep track of a level of activity each day for that user. The wearable device **100** may also detect and track a user's vital signs and/or physical location, e.g., via a positioning service, GPS, etc., in accordance with an embodiment. As another example, such as for in the elderly care industry, in addition to health related measurements, the wearable device **100** may include communication features, including the ability for a user to initiate an SOS or emergency call in an emergency situation and/or listen to and/or speak to a representative provided at a remote location, in accordance with an embodiment.

[0035] Processing features of a device case of the wearable device **100** are generally discussed throughout this disclosure and schematically shown with reference to FIG. **1**K. The schematic drawing is representative only and not intended to be limiting with regards to the illustrated features. The wearable device includes a device case **110** that includes a housing which contains or encloses one or more measurement device(s) and/or one or more sensor(s) therein, generally represented as **140**, a battery **144**, a memory **146**, and a processor **150** or processing circuitry for receiving and processing measurements/sensed data collected by the measurement device(s)/sensor(s) **140**. The processing circuitry **150** may be configured to monitor a wearer's health, display time, alert signals or other monitoring functionality. Examples of possible processing circuitry and related functions provided in the device case **110** and wearable device **100** may be found in U.S. application Ser. No. 15/299,025, filed on Oct. 20, 2016, and Ser. No. 15/298,947, filed on Oct. 20, 2016, both of which are incorporated by reference herein in their entireties. The one or more sensors **140** may be physiological sensors such as a heart rate sensor, a blood sugar level sensor, a temperature sensor, a skin conductivity sensor, and/or an electrocardiograph sensor configured to measure the wearer's vitals, as well as step counting sensors (accelerometers), location sensing device (GPS), and the like. In an embodiment, one or more of sensors may also be placed on the interchangeable accessory cover and configured to communicate with the processing circuitry **150** via electrical connectors. In an embodiment, one or more of the sensors **140** and/or sensors on the accessory cover(s) may communicate wirelessly with the processing circuitry **150**. The housing of the device case **110** further includes an audio device **142** or speaker therein that is configured to emit sound(s) or signal(s), e.g., as prompted by processor **150**, to a user of the wearable device **110**. As generally understood by one of ordinary skill in the art, sounds or signals that are emitted by the wearable device **100** may include an alarm (e.g., beeping) to alert the user of the wearable device **100**, clicks or positive/negative sounds for providing feedback to the user, and/or spoken words, phrases, and/or a voice of a remote party that utilizes the device's communication features, e.g., via an SOS or emergency call.

[0036] Referring now specifically to FIGS. **1**A-**1**J, the wearable device **100** has a main body portion or housing—referred to herethroughout as a "device case" **110**—and one or more accessories or accessory covers that attach to it in some manner, so that the wearable device **100** may be worn on different parts of a user's body. The housing of the device case **110** has a front, a top, a bottom, a first (left) side, a second (right) side, and a back, respectively, shown in FIGS. **1**B through **1**F, and FIG. **1**I, along with an interchangeable accessory cover **120** attached thereto in the form of a back cover. In accordance with an embodiment, the housing of the device case **110** may be generally circular or round and have a perimeter or circumferential edge **106** extending between its front face and a back plate **132** (see FIG. **1***l*) that defines its side(s). As generally understood in the art, the housing includes a hollow receiving area (not shown) (e.g., between the front face and the back plate **132**) for receiving and containing electronic parts, such as the sensors/measurement devices **140**, audio device **142**, and processor **150**, for the wearable device **100**.

[0037] In addition to containing the above-described sensors **140** and processor **150** therein, the device case **110** has a display **130** or screen on or across the front or face of the case **110**, e.g., see FIG. **1**B. The display **130** or screen is configured to display data corresponding to measurements measured by the at least one measurement device **140**, user information, options and/or settings, and the like. For example, the data that is displayed may be direct measurement data, e.g., a number of steps, or indirect/calculated data, that is processed by the processor **150**. The display **130** may also be used to show a user a variety of options and menu items for customization and/or relating to the user themselves, which is generally known in the art and thus not further described here. The display **130** includes a glass or plastic portion, for example. The front surface or face of the display **130** may be substantially flat or slightly rounded. The type of display or screen is not limited—the display or screen may be a LCD or an LED type of display, for example. In an embodiment, the display **130** has an outer perimeter or an edge that is substantially circular in shape, when viewing from the front, i.e., in Z direction (see, e.g., FIG. **1**B). However, the display **130** may also be oval, rectangular, or another geometric shape. In one embodiment, the shapes of the housing and display **130** are similar, e.g., both are substantially circular. In another embodiment, the shapes of the housing and display **130** are different, e.g., one is substantially ovular, while another is substantially circular.

[0038] Surrounding the display **130** is a front edge **108** of the device case **110**. The front edge **108** may include a bezel or groove for holding the glass or plastic portion of the display **130** in position. As seen in FIGS. **1**C and **1**D, the front edge **108** may be a beveled front edge that is provided at an angle α relative to a plane that extends (horizontally) across the display **130**. The beveled front edge **108** extends between a perimeter or a circumferential edge of the display **130** and an edge or side surface of the housing of the device case **110**. The beveled front edge **108** provides better viewing and generally makes the wearable device **100** appear smaller.

[0039] In accordance with an embodiment, an orientation indicator **115** is provided on or in the housing of the device case **110** to indicate a viewing direction or position for viewing the display **130** or screen, e.g., so that a user may recognize a correct orientation of the wearable device **100**, even when the display **130** is off. As shown in FIG. **1**B, for example, the orientation indicator **115** may be provided on the front of the device case **110** in the form of a small pointed portion extending from the front edge **108** of the housing or case. In an embodiment, the pointed portion of the orientation indicator **115** is positioned over the display **130** or

screen on the front of the device case. In an embodiment, the orientation indicator **115** may be located at a 12 o'clock position typically associated with a watch or a clock. In accordance with an embodiment, the orientation indicator **115** may be a structural part that is formed as part of the housing of the device case **110**. In one embodiment, the orientation indicator **115** may be continuously formed with the front edge **108**, e.g., as a part of the bezel, while an edge of the glass or plastic portion of the display **130** is formed such that it includes a corresponding or complimentary shaped indentation or cutout (e.g., extending into the display **130** from its edge) for receiving the orientation indicator **115** therein (when the device case **110** is assembled). The shape of the orientation indicator **115** that is formed in the front edge **108** or in the housing (as part of its front face) is not intended to be limited to the illustrated pointed portion—it may be angular, triangular, or polygonal in shape or any other geometrical shape, for example, that projects over or into a portion of the display **130**.

[0040] Alternatively, in another embodiment, the orientation indicator **115** may also or alternatively include an indentation or a marking provided on the front edge **108** of the device case **110** that does not affect or change the edge of the display **130**. Alternatively, or in addition, the orientation indicator **115** may be configured to be displayed on the display **130** or screen when the wearable device **100** is turned on.

[0041] In an embodiment, the orientation indicator **115** may also indicate a position for aligning the wearable device **100** with electrical connectors of an external device.

[0042] As shown in FIG. **1**C, one or more speaker holes **116***a* may be provided on a side of the device case **110**, e.g., a top side or top edge of the housing (part of edge **106**). The location of the speaker holes **116***a* is not intended to be limiting; e.g., they may also or alternatively be provided on a bottom edge. In an embodiment, the speaker holes **116***a* may be provided on a top with respect to a vertical centerline (see FIG. **1**B, in the Y-direction) of the device case **110**. The speaker holes **116***a* may be configured to emit sound(s) or signal(s) such as an alert, voice of a remote party, etc., as noted above, from the audio device **142** and/or communication features of the wearable device **100**. The holes **116***a* are designed such that audio may be transmitted at its maximum capacity. The speaker holes **116***a* may be water resistant.

[0043] Another hole **116***b* or holes may be provided on another side of the device **110**, e.g., on a bottom side or bottom edge of the housing (part of edge **106**), as shown in FIG. **1**D. In one embodiment, hole **116***b* is a reset access point, wherein a device or tool may be inserted through the hole **116***b* to press a button or part on an electronic part contained within the housing of device case **110**, to reset or restart the electronics and/or display of the wearable device **110**. In another embodiment, the hole **116***b* may be a speaker hole. In yet another embodiment, the hole **116***b* is simply included as part of the housing for air flow.

[0044] In accordance with one embodiment, the speaker holes **116***a* are provided on a first side (e.g., top) of the wearable device **100** and the hole **116** is provided on a second side that is opposite to the first side (e.g., bottom). In an embodiment, the speaker holes **116***a* and hole **116***b* may be placed on the edge **106** relative to the vertical centerline (see FIG. **1**B) of the device case **110**.

[0045] The device case **110** also has a first button **114** provided on one side of the case, e.g., a left side of the case as shown in FIG. **1**E, and a second button **116** provided on an opposite side, e.g., a right side, of the case (opposite relative to the side that button **114** is provided on), as shown in FIG. **1**F. In an embodiment, the first button **114** and the second button **112** may be located on the edge **106** and aligned along a horizontal centerline (see FIG. **1**B, in the X-direction) of the device case **110**. The buttons **114**, **112** may be pressed to move (e.g., inwardly) relative to the edge **106** or side. The first and second buttons **114**, **112** may be configured to implement a function or an action via the processor **150** when they are pressed (e.g., inwardly) by a user.

[0046] In one embodiment, the first button **114** may be ovular in shape, for example, as shown in FIG. **1**E. However, the button **114** may be circular, rectangular, or other shapes. In an embodiment, the first button **114** has a raised, tactile portion **118** or textured portion (e.g., bumps) on its surface. This textured or tactile portion **118** enables a user to easily distinguish the first button **114** from the second button **112** on the opposite side of the device case **110** based on touch (using a finger). In one embodiment, the raised, tactile portion **118** is in the form of braille. In accordance with one embodiment, button **114** is designed as an emergency button, e.g., used to make an SOS call via the wearable device **100** to another party. For example, in the elderly care industry, when the user feels that he/she is in an emergency situation, such as a fall or in a health crisis situation, the user may physically activate the button **112** on the device **100** to trigger a signal to be sent from the device (e.g., via its processor **150** and/or communication features) to an emergency handling service, service center, or designated party. In a case where braille is provided as the tactile portion **118** on button **114**, the braille may read "SOS", for example. The user may receive commands, updates, alerts, or instructions via the audio device **142** emitting sound(s) through the speaker holes **116**, for example.

[0047] In one embodiment, the second button **112** may be circular in shape, for example, as shown in FIG. **1**F. However, the button **112** may be ovular, rectangular, or other shapes. The button **112** may be in communication with the processing circuitry **150** to allow navigation between menus and/or data displayed via the display/screen **130**. Further, in an embodiment, the button **112** may include arrows **113**, or other indicators, in or on its surface to visually indicate its purpose and/or navigation directions. The button **112** may also trigger other functions related to the display **130**, including a rotation or flipping operation of an object displayed on the screen.

[0048] In accordance with one embodiment, the first button **114** of the wearable device **100** is ovular in shape and the second button **112** is circular in shape.

[0049] A back of the device case **110**, i.e., the face that is opposite to the display **130**, includes the back plate **132** which is connected to the edge **106** to contain its electronic components (e.g., see FIG. **1**K) therein. The device case **110** also has an electrical connector portion **155** provided on its back plate **132**, as shown in FIG. **1**I, for example, and generally represented in FIG. **1**K. In accordance with an embodiment, the electrical connector portion **155** is used to establish an electrical connection between the processor **150** within the device case **110** and an external device (e.g., a charging station or a base station, which are not shown) such

that measurements that are collected by the at least one sensor/measurement device **140** and processed by the processor **150** are communicated to the external device. Generally, the external device is designed to not only charge the wearable device **100**, but to also communicate with the wearable device **100** (e.g., processor **150**) to receive and send data and information. The electrical connector portion **155** may include one or more contact points or electrical connectors associated therewith. In an embodiment, such an electrical connector portion **155** may be formed from wires that extend from the processor and into holes of the connector portion such that an end of each wire is accessible. In the exemplary illustrated embodiments of the figures, the back plate **132** includes four electrical wire ends. Each of the wires of the connector portion **155** may have separate functions; for example, one wire of the electrical connector portion **155** may be used for charging the wearable device **100**, and other (e.g., three others, as shown here) electrical connectors of the electrical connector (**125**) may be used for establishing a communication link between the wearable device **100** (e.g., a processor therein) and an external device. As such, the electrical connector portion **155** may be used to charge the wearable device **100** as well as transfer data or health related information collected by the wearable device **100** to the external device.

[0050] In an embodiment, the electrical connectors may be made of electrically conducting material (e.g., copper, aluminum, or other metal). The electrical connectors may take several forms and shapes, for example, the electrical connector may be in the form of wires, and/or a strip, may be flexible and/or may be etched on a surface of the device case **100** (and/or the interchangeable accessory cover, described later). In an embodiment, the electrical connectors may be contact points or a contact surface. In an embodiment, the electrical connectors may include wire with terminals having flat end connected by a wire or a strip. In another embodiment, the terminals may be connected to contact pins, for example, by clamping crimping, soldering, screw termination, etc. In yet another embodiment, the electrical connectors may be ring-shaped or a hollow cylinder such that an electrical contact may be established via a pin or wire type of electrical contacts of the interchangeable accessory cover.

[0051] The wearable device **100** also includes an interchangeable accessory cover **120** removably attached to the device case **110**. One exemplary embodiment of the interchangeable accessory cover **120** is best seen in FIGS. **1**G-IJ. Among other things, the accessory cover **120** is configured to provide accessibility to the electrical connector portion **155** on the back of the device case **110**, when the accessory cover **120** is attached thereto. As described later, the accessibility to electrical connector portion **155** provided by the accessory cover **120** may be via an opening, a hole, a cutout portion, or a shape of the cover itself, or via an electrical connector portion **125** provided on the accessory cover **120**. In one embodiment, the device case **110** and the accessory cover **120** may be communicably coupled to each other such that the wearable device **100** may establish an electrical connection as well as communication link with an external device when the cover **120** is placed into electrical contact with the external device.

[0052] In accordance with embodiments herein, the interchangeable accessory cover **120** is configured to cover at least a portion of the back of the device case **110** when attached to the device case. In some cases, the accessory cover **120** is configured to cover an entire back of the device case **110**. Generally, the interchangeable accessory cover **120** is shown and described herein as being removably attached to a back of the device case **110** (specifically, back plate **132**); however, the illustrated exemplary embodiments should not limit the interchangeable accessory cover **120** from including or having any attachment or configuration that attaches to a portion of the sides or edge **106**, in addition or alternatively to the back of the device case **110**. For example, the cover **120** may be designed to cover or surround at least part of the back, while using a securement device or mechanism on or around an edge **106** or side of the device case **110**.

[0053] As shown in FIGS. **1**A-**1**J, for example, the interchangeable accessory cover **120** may be provided in the form of a plate with a generally flat outer (back) surface **126** and shaped in the form of a disc, which is similar to the shape of back plate **132** (e.g., both are substantially circular). Thus, when the accessory cover **120** is attached to the device case **110**, it forms a wearable device **100** having a puck-like shape that may be easily slipped into a user's pocket. Like the front edge **108** of the device case **110**, the accessory cover **120** may include a beveled edge **136** that is provided at an angle **3** (see FIG. **1**C) relative to a plane extending across its generally flat, outer surface **126**. In one embodiment, as shown in FIGS. **1**B-IJ, the accessory cover **120** is similarly shaped to the housing of device case **110**—or at least its back plate **132**—for example, substantially circular in shape. In accordance with embodiments herein, the device case **110** and the accessory cover **120** may be similarly shaped (circular, oval, rectangular or other polygonal or geometric shape).

[0054] In addition to its back portion or outer surface **126** (see FIGS. **1**I and **1**J), the interchangeable accessory cover **120** has a front portion or inner surface **124** (see FIGS. **1**H and **1**J). The front portion is configured for placement against a portion of the device case **110**; specifically, as shown in FIGS. **1**H and **1**I, structural features are provided on the cover **120** and device case **110** to assist in alignment and attachment. The inner surface **124** of cover **120** has a projection **123** provided on its inner surface **124** that extends a distance d (see FIG. **1**J, in the Z-direction) away from the surface, that is visible when viewed from the X-direction. Back plate **132** of the device case **110** has a recess **134** therein that is complimentary to the shape of the projection **123** (here, as an example, both the projection **123** and recess **134** are shown as being generally rectangular in shape). Accordingly, recess **134** may extend into the housing at distance d in the Z-direction. As represented in FIG. **1**J, the inner surface **124** of cover **120** may be aligned with the back plate **132** of the device case **110** by placing the projection **123** in alignment with and into a recess **134** in the back plate **134**. Of course, it should be understood that such projection and recess is exemplary only, and not intended to be limiting. The placement of the projection and recess may be swapped, e.g., the cover **120** may include a recess and the device case **110** may include a projection for insertion into the recess. Alternatively, other structural alignment features or complimentary portions may also be used for aligning and/or removably attaching the interchangeable accessory cover **120** and device case **110** together. For example, in one embodiment, a magnetic attachment may be used by providing magnets on the inner surface **124** and back plate **132**,

or by forming structural features such as projection **123** and recess **134** out of magnetic materials.

[0055] To further secure the interchangeable accessory cover **120** to the device case **110**, additional mechanical mechanisms or devices may be used. In such cases, the projection **123** and recess **134** may be used as alignment features. In the illustrated embodiment of FIGS. **1**G-**1**J, the interchangeable accessory cover **120** also includes one or more holes **128** and the back plate **132** includes one or more receiving holes **138**. In an embodiment, the receiving holes **138** are threaded. The holes **128** of the accessory cover **120** may be aligned with the receiving holes **138** on the back plate **132** of the device case **110** and configured to receive screws **122** (see FIG. **1**G) therethrough that are screwed into and secured onto threads of the receiving holes **138**, thereby securing the interchangeable accessory cover **120** to the device case **110**.

[0056] The holes **128** and **138** may be provided as an alternative to or without the projection **123** and recess **134** shown in the cover **120** and device case **110**, in accordance with an embodiment.

[0057] Of course, the use of aligned holes and screws as the removable attachment mechanism for interchangeable accessory cover **120** is not intended to be limiting. FIGS. **6**A-**10**B show schematic representations of alternate designs and (mechanical) mechanisms for attaching device case **110** and an interchangeable accessory cover **120** together to form the wearable device **100**. For example, FIGS. **6**A and **6**B illustrate embodiments wherein threaded attachment mechanisms are used in the wearable device. In one embodiment, shown in FIG. **6**A, the device case **110** may include a recess **602** with threads formed along the perimeter of a recess on an inner side of the device case **110**. The cover **120** may include a projection **604** projecting from an inner side that also has threads. The threads of the recess **602** and the shaft **604** are compatible with each other and form a secure attachment when screwed together. In another embodiment, as shown in FIG. **6**B, the device case **110** may include a tapered recess **612** with threads formed along the perimeter of the tapered recess **612** on an inner side of the device case **110**. The cover **120** may include a tapered projection **614** projecting from an inner side with external threads thereon. The shape and dimensions of the recess and the shaft along with the threads are such that the device case **110** and the cover **120** may be aligned so that the threads on the device case and the cover engage with each other and form a secure attachment when screwed together.

[0058] In another embodiment, the device case **110** may include external threads (not shown) formed along, for example, an outside perimeter or edge **106**, while the cover **120** may include internal threads for connection therewith.

[0059] FIG. **7** illustrates another attachment mechanism for parts of the wearable device according to another embodiment. The cover **120** may include an extension along an edge on its inner side that forms a recess for receiving a portion of the device case **110** therein. In one embodiment, a dimension d**2** (e.g., an inner diameter) measured within the edge is less than or substantially equal to a dimension d**1** associated with the device case **110** (e.g. outer diameter of the device case **110**). Then, the edge of the cover **120** may be placed around the perimeter of the device case **110**, for receipt of the device within the formed recess of the cover. In one embodiment, the edge includes a snap fit attachment mechanism configured to be snapped into place over at least a portion of the edge **106** of the device case **110**.

[0060] FIG. **8** illustrates another embodiment of an attachment mechanism for parts of the wearable device that includes at least one retractable pin and a corresponding receiving area. In the exemplary illustration, the device case **110** may include pins **803** and **805** projecting outward (e.g., along the Y-direction) from the perimeter or edge **106** of the device case **110**. One or more of the pins **803** and **805** may be spring loaded, thus allowing the pins to retract along the length (e.g., in Y-direction) upon application of force and extend when the force is released. The cover **120** may include projections extending from an inner side of the cover, the projections including holes **804** and **806** therein which are configured to receive the pins **803** and **805** of the device case **110**. The cover **120** and the device case **110** may be aligned and the pins **803** and **805** may be compressed such the pin **803** may be aligned and inserted into hole **804** and pin **805** is aligned and inserted into hole **806**.

[0061] FIG. **9** illustrates a locking attachment mechanism including one or more lock pins **904** and **906** and corresponding receiving slots **903** and **905**, respectively, for said lock pins **904** and **906**. The cover **120** may include projections extending from an inner side of the cover, for example, and pins **904** and **906** may extend from the projections towards a center of the cover **120**. The lock pins may be of different shape and size (as shown) or of similar shape and size, and are not intended to be limiting. The slots **903** and **905** having a shape and size corresponding to the lock pins **904** and **906**. The slots **903** and **905** may be formed along the perimeter of the device case **110**, for example, e.g., extending into the edge **106** and housing. The cover **120** and the device case **110** may be aligned and the lock pins **904** and **906** are aligned with and inserted into slots **903** and **905**.

[0062] FIGS. **10**A and **10**B illustrates examples of a magnetic attachment for the wearable device in accordance with embodiments herein. FIG. **10**A illustrates one embodiment of the device case **110** and cover **120** having magnets. In an embodiment, the device case **110** may be lined with magnets **1003** and **1005** or a magnetic material on an inner side of the device case **110**. For example, the device case **110** may include a recess with the magnets **1003** and **1005** disposed within the recess. In an embodiment, the magnet **1003** and **1005** may be a rectangular piece or a circular piece that may fit within the recess. The cover **120** may also include magnets (or magnetic material) **1004** and **1006** projecting perpendicularly from an inner surface. Furthermore, the magnets **1004** and **1006** may be located relatively below the magnets **1003** and **1005** of the device case **110** when the device case **110** and cover **120** are aligned along a center axis. When assembled, the magnet **1004** of the cover **120** is magnetically coupled the magnet **1003** of the device case **110** and the magnet **1006** of the cover **120** is magnetically coupled to the magnet **1005** of the device case **110**, thus creating a magnetic coupling to securely attach the cover **120** to the device case **110**.

[0063] FIG. **10**B illustrates an inner side of the device case **110** and the cover **120** lined with magnets, according to another embodiment. The device case **110** may include a magnet (or a magnetic material) **1033** lined on an inner surface in the proximity of the perimeter of the device case **110**. In an embodiment, the magnet **1033** may be located within a recess formed on the inner surface of the device case **110**. Similarly, the cover **120** may include a magnet (or

magnetic material) **1032** lined on an inner surface in the proximity of the perimeter of cover **120**. Additionally or alternatively, the magnet **1032** may be located within a recess formed on the inner surface of the cover **120**. Furthermore, the magnet **1032** of the cover **120** is located such that when assembled with the device case **110**, the magnet **1032** and **1033** are partially or completely in contact with each other thus creating a magnetic coupling to securely attach the cover **120** to the device case **110**.

[0064] It should be understood that the schematic illustrations of FIGS. **6**A-**10**B are for illustrative purposes only and not intended to be limiting. It should also be understood to one of ordinary skill in the art that the projections and recesses may be altered between the device case **110** and the cover **120**, e.g., instead of cover including projections, the device case includes projections. In addition, other mechanisms for attaching. Although a variety of complimentary designs are shown in FIGS. **6**A-**10**B, the attachment of device case **110** and cover **120** is not limited to such a configuration.

[0065] Referring back to the illustrated embodiment of FIG. **1**G, for example, in one embodiment, the interchangeable accessory cover **120** has its own electrical connector portion or electrical contact portion **125** that has one or more electrical contact points. Throughout this disclosure, with regards to each accessory cover described herein, the electrical connector portion is referred to as an "electrical contact portion." However, this is for explanatory purposes only. It should be understood that such an electrical contact portion may be similar to if not the same as the electrical connector portion of the device case in that it functions to establish electrical communication with the processor, sensors, communication circuitry, etc. as well as to establish communication with an external device (e.g., a charging station, a base, a server). In an embodiment, the electrical connectors of electrical connector portion **125** may be made of electrically conducting material (e.g., copper, aluminum, or other metal). The electrical connectors may take several forms and shapes, for example, the electrical connector may be in the form of wires, and/or a strip, may be flexible and/or may be etched on a surface of the interchangeable accessory cover **120**. In an embodiment, the electrical connectors may be contact points or a contact surface. In an embodiment, the electrical connectors may include wire with terminals having flat end connected by a wire or a strip. In another embodiment, the terminals may be connected to contact pins, for example, by clamping crimping, soldering, screw termination, etc. In yet another embodiment, the electrical connectors may be ring-shaped or a hollow cylinder such that an electrical contact may be established via a pin or wire type of electrical connector portion of the device case. Also, generally, throughout this disclosure, each electrical contact portion (e.g., **125**, **225**, etc.) is depicted and described as being of similar shape and configuration to that of the electrical connector portion (**155**). However, it should be understood that, not only may the shape, configuration, number of wires, etc. change for both types of portions, but the electrical contact portion(s) may have a different shape, configuration, number of wires, etc. as compared to the electrical connector portion (**155**). Despite its configuration, as explained herein, the electrical contact portion associated with each type of accessory cover may be used to establish a connection with the processor **150**, which may be via electrical connector portion **155**, for example.

[0066] The electrical contact portion **125** may be provided in an area **135** on the accessory cover **120** that may be configured for alignment relative to a location of the electrical connector portion **155**, in accordance with an embodiment. In one embodiment, the electrical contact points of the electrical contact portion **125** extend between the front portion **124** and the back portion **126**, such that the electrical contact points are accessible via the back portion **126** when the interchangeable accessory cover **120** is attached to the device case **110**. The electrical contact portion **125** may be formed from wires that are inserted through holes of the plate of cover **120**, wherein an end of each wire is accessible on either side of the plate. In the exemplary illustrated embodiments of the figures, the electrical contact portion **125** includes four electrical wire contact points. In a similar manner as described previously with respect to the connector portion **155**, each of the wires of the contact portion **125** may have separate functions, e.g., charging, data transfer, and designed to operate in a similar manner. As such, the electrical contact portion **125** may be used to charge the wearable device **100** as well as transfer data or health related information collected by the wearable device **100** to the external device.

[0067] More specifically, the electrical contact points of the electrical contact portion **125** of the interchangeable accessory cover **120** may be configured for alignment with the wires of the electrical connector portion **155** on the device case **110** such that they are in electrical communication. As shown in the Figures, the electrical contact points—shown as four circles in FIG. **1**H—on the front portion **124** of the interchangeable accessory cover **120** may be configured for alignment with and/or connection with the electrical connector **155** on the back plate **132** of the device case **110**, when the accessory cover **120** is secured thereon. In one embodiment, part of the electrical contact portion **125** may be placed in direct contact with the electrical connector portion **155**. Accordingly, an electrical connection between the processor **150** and the external device may be established using the electrical contact points that are accessible (on the back portion **126**) via the electrical contact portion **125** of the interchangeable accessory cover **120**. Measurements collected by the measurement device(s) **140** or sensor(s) and processed by the processor **150** may be communicated to the external device via the interchangeable accessory cover **120**. In addition, data or information may be communicated to the processor **150** and/or electrical components of the wearable device **100** from the external device via using the electrical contact portion **125** of the accessory cover **120** (e.g., aligning the contact portion **125** on an electrical connector of the external device).

[0068] Although the electrical contact portion **125** and connector portion **155** are generally described as being parts containing wires that are aligned, it should be understood that such a configuration is not intended to be limiting. For example, in one embodiment, the electrical contact portion **125** on the accessory cover **120** may project from its inner surface **124** for insertion into a receiving area or hole within the device case **110**. The electrical contact portion **125** may be passed through the hole to connect to electrical connectors **155** contained within the device case **110**. In another embodiment, the device case **110** may include a plurality of holes, one hole for receiving each part of the electrical connector portion **125**. In yet another embodiment, the electrical connector portion **155** itself or its wires may

project away from a back surface of the device case **110**. In one embodiment, the connector portion **155** and/or its wires may be inserted into a receiving area or holes of the accessory cover **120** such that the portion **155** and/or its wires are accessible on the back portion **126** of the cover **120**.

[0069] In still yet another embodiment, instead of providing electrical contact portion **125**, the accessory cover **120** may include an opening, a hole, a cutout portion, or a shape (e.g., either in its edge or the shape of the body itself) for allowing access to the electrical connector portion **155** of the device case **110** when the cover **120** is attached thereto. Such an opening, hole, portion, etc. may be similarly shaped to the electrical connector portion **155**, for example. Alternatively, the opening, hole, etc. of the accessory cover **120** may be larger than the area of the electrical connector portion **155**.

[0070] The materials and manufacturing methods used to form the housing of the device case **110** and interchangeable accessory cover **120** are not limited. The housing of the device case **110** and the accessory cover **120** may be made of similar material, for example, aluminum, steel, gold, silver, other metallic material, plastic, and formed using a similar manufacturing process, e.g., injection molding or casting. In an embodiment, the accessory cover **120** may be made of a different material than the housing of the device case **110**. For example, the accessory cover **120** may be made of plastic while the housing is made of metal. Also, the housing of the device case **110** and/or accessory cover **120** may be formed from multiple materials. In some instances, the materials or parts of the device case **110** and/or cover **120** may be opaque or transparent. Using a transparent portion may provide visibility to components, such as the circuitry or sensors within the device case, for example.

[0071] Moreover, the wearable device **100** as disclosed herein is designed to be interchangeable in that different accessories may be provided as part of the wearable device. In accordance with an embodiment, the interchangeable accessory cover **120** may be a first type of cover, which may be removed from the device case **110** and replaced with one or more other types of accessory covers, as discussed with respect to the remaining figures. That is, the device case **110** remains the same while the accessory cover is changed. As shown and described below with reference to different embodiments in FIGS. **2**A-**5**G, accessory covers may be removably attached to a back portion (e.g., using back plate **132**) of the device case **110**. Changing the back portion is just one option, however. As previously noted, an edge or sides of the device case **110** may be used for attachment purposes. Additionally, the illustrated embodiments and accessories are intended to be exemplary and are not intended to limit the type or use of only those accessories illustrated. It should be understood that other types of interchangeable accessory covers that include, e.g., a keychain, a keyring attachment, a ring, a strap for wrist or shoulder, etc. may be used.

[0072] For purposes of clarity and brevity, like elements and components throughout the Figures are labeled with same designations and numbering as discussed with reference to FIGS. **1**A-**1**K. Thus, although not discussed entirely in detail herein, one of ordinary skill in the art should understand that various features associated with the wearable device **100** as shown in FIGS. **2**A-**10**B may be similar to those features previously discussed. Additionally, it should be understood that the features shown in each of the individual figures is not meant to be limited solely to the illustrated embodiments. That is, the features described throughout this disclosure may be interchanged and/or used with other embodiments than those they are shown and/or described with reference to.

[0073] FIG. **2**A is an exploded, back side angled view of a second type of interchangeable accessory cover **220** and the device case **110** that may be attached together to form a wearable device **200**, in accordance with another embodiment of this disclosure. FIGS. **2**B-**2**G illustrate a front, a top, a bottom, a first (left) side, a second (right) side, and a back, respectively, of the wearable device **200**. Interchangeable accessory cover **220** includes a necklace attachment portion **202** that allows a user to wear the wearable device **200** as a necklace or pendant around their neck, for example. In some cases, wearable device **200** may be worn around a user's wrist. In a similar manner to interchangeable accessory cover **120**, this second interchangeable accessory cover **220** is configured to provide accessibility to the electrical connector portion **155** on the back of the device case **110**, when the interchangeable accessory cover **220** is attached thereto. In one embodiment, the device case **110** and the accessory cover **220** may be communicably coupled to each other such that the wearable device **200** may establish an electrical connection as well as communication link with an external device when the cover **220** is placed into electrical contact with the external device.

[0074] The second interchangeable accessory cover **220** may have a portion provided in the form of a plate for placement on the back of the device case. The plate of the accessory cover **220** has an inner surface **224** (see FIG. **2**H) and an outer surface **226** (see FIG. **2**A), and the necklace attachment portion **202** extending from the plate. Like accessory cover **120**, the plate of accessory cover **220** may include a beveled edge that is provided at an angle **3**. In an embodiment, the plate itself, its inner surface **224**, and/or outer surface **226** may be similarly shaped to the housing of device case **110**—or at least its back plate **132**—for example, both have a substantially circular shape or any other shape (e.g., square, rectangular, oval, etc.) that correspond to each other. In one embodiment, the plate associated with cover **220** is substantially disc shaped.

[0075] In addition, shown in FIG. **2**H, the interchangeable accessory cover **220** may include a projection **223** (see FIG. **2**H) that is similar to projection **123**, for alignment with a complimentary sized recess **134** (shown in FIG. **2**A) on a back portion of the device case **110**, in accordance with an embodiment. Furthermore, the second interchangeable accessory cover **220** may also include one or more holes **228** that may be aligned with the receiving holes **138** on the back plate **132** of the device case **110** in a similar manner as described with respect to holes **128** of accessory cover **120**. The holes **228** may be configured to receive screws **122** (see FIG. **2**G) therethrough that are screwed into and secured onto threads of the receiving holes **138**, thereby securing the interchangeable accessory cover **320** to the device case **110**. The holes **228** may be provided as an alternative to or without the projection **223** shown in the cover **220**, in accordance with an embodiment. Again, the use of holes and screws as the removable attachment mechanism for interchangeable accessory cover **220** is not intended to be limiting. As described in detail previously with regards to FIGS. **6**A through **10**B, it should be appreciated that the third interchangeable accessory cover **220** is not limited to screw-

type attachment and may be modified to use other means of removable attachments such as those described with reference thereto.

[0076] Hence, either the first or second interchangeable accessory covers **120** or **220** may be removed and replaced by the third interchangeable accessory cover **320**, or vice-versa. Accordingly, the accessory associated with the device case **110** may be changed for the wearable device so that it may be worn on different parts of a user's body.

[0077] An electrical connector portion or electrical contact portion **225**, which is equivalent to the previously described electrical contact portion **125** and its embodiments, is disposed on the outer surface **226** of the accessory cover **220**. As shown in FIGS. **2**A, **2**G, and **2**H, for example, in one embodiment, the interchangeable accessory cover **220** has its own an electrical contact portion **225** that has one or more electrical contact points. The electrical contact portion **225** may be provided in an area **235** on the accessory cover **220** that may be configured for alignment relative to a location of the electrical connector portion **155**, in accordance with an embodiment. In one embodiment, the electrical contact points extend between the front portion or inner surface **224** and the back portion or outer surface **226**, such that the electrical contact points are accessible via the outer surface **226**/back portion when the interchangeable accessory cover **220** is attached to the device case **110**. In another embodiment, holes are provided for receipt of wires therein. Since the features relating to electrical contact portion **225** are similar to the electrical contact portion **125** (e.g., use of wires, four electrical wire contact points, functions (charging, data transfer), etc.) which are described in detail above with respect to FIGS. **1**A-**1**J, they are not all necessarily repeated here. Nonetheless, it should be understood that the accessory cover **220** may include any number of features described with reference to electrical contact portion **125**.

[0078] The electrical contact points of the electrical contact portion **225** of the accessory cover **220** may be configured for alignment with the wires of the electrical connector portion **155** on the device case **110** such that they are in electrical communication. In one embodiment, part of the electrical contact portion **225** may be placed in direct contact with the electrical connector portion **155**. Accordingly, an electrical connection between the processor **150** and the external device may be established using the electrical contact points of electrical contact portion **225**. Measurements collected by the measurement device(s) **140** or sensor (s) and processed by the processor **150** may be communicated to the external device via the interchangeable accessory cover **220**. In addition, data or information may be communicated to the processor **150** and/or electrical components of the wearable device **200** from the external device via using the electrical contact portion **225** of the accessory cover **220**.

[0079] Of course, it should also be noted that in yet another embodiment, instead of providing electrical contact portion **225**, the accessory cover **220** may include an opening, a hole, a cutout portion, or a shape for allowing access to the electrical connector portion **155** of the device case **110** when the cover **220** is attached thereto, as previously described.

[0080] The materials and manufacturing methods used to form the interchangeable accessory cover **220** are not limited. The accessory cover **220** may be made of similar material as the device case **110**, for example, aluminum, steel, gold, silver, other metallic material, plastic, and formed using a similar manufacturing process, e.g., injection molding or casting. In an embodiment, the accessory cover **220** may be made of a different material than the housing of the device case **110**. Also, the accessory cover **220** may be formed from multiple materials.

[0081] As shown in FIG. **2**I, for example, the necklace attachment portion **202** of accessory cover **220** extends outwardly from an edge thereof. The necklace attachment portion **202** may include a lug **204** that is connected or attached to a beveled edge of the plate, in accordance with an embodiment. In the illustrated embodiment, the lug **204** extends forwardly at a distance D (see FIG. **2**I) from the inner surface **224** of the plate in the Z-direction (away from the outer surface **226**), which is visible when viewed from the X-direction. In one embodiment, the lug **204** has a flat surface **206** that is configured for placement against the edge **106** of the device case **110** when the accessory cover **220** is attached thereto (see FIGS. **2**E and **2**F), so the lug **204** is substantially flush with respect to the perimeter or circumference of the edge **106** of the device case **110**.

[0082] The lug **204** has a receiving hole **208** configured to receive a chain, a string, a wire, or other type of cord or band (which may or may not be flexible), generally represented as cord **210**, therethrough. As previously noted, the cord **210** allows a user to wear the wearable device **200** like a necklace around a neck, around a wrist, or other body part. The receiving hole **208** may be positioned forwardly relative to the inner surface **224**, as shown in FIG. **2**I, such that when assembled, the receiving hole **208** is positioned near or closer to a center or halfway point of a width of the edge **106**.

[0083] When the wearable device **200** is assembled, the lug **204** may be positioned in a location that aligns with an orientation indicator **115** in the 12 o'clock position of the device case **110**, e.g., along a vertical centerline of the device **200** (see FIG. **2**B) in the Y-direction, when the cover **220** is attached to the device case **110**. An axis through the receiving hole **208** runs parallel to a horizontal centerline in the X-direction (e.g., see FIGS. **2**B and **2**C).

[0084] The lug **204** may be formed as an integral part of the second interchangeable accessory cover **220** or as a separate attachment that is secured to the plate of the cover. In an embodiment, the lug **204** may be removably attached to the plate of the second interchangeable accessory cover **220**, for example, via a snap fit connection, screw-type connectors, or other mechanical attachment. In an embodiment, the lug **204** may be fixed to the interchangeable accessory cover **220**. Furthermore, in other embodiments, the lug **204** may be hingedly attached or rotatably attached to the interchangeable accessory cover **220**, allowing the lug **204** to rotate relative to the interchangeable accessory cover **220** and/or the device case **210**.

[0085] A third type of interchangeable accessory cover **320** along with device case **110** is shown in FIGS. **3**A-**3**I, forming a wearable device **300** according to another embodiment of the disclosure. Much like interchangeable accessory cover **120**, interchangeable accessory cover **320** is configured to provide accessibility to the electrical connector portion **155** on the back of the device case **110**, when the interchangeable accessory cover **320** is attached thereto. In one embodiment, the device case **110** and the accessory cover **320** may be communicably coupled to each other such that the wearable device **300** may establish an electrical connection as well as communication link with an external

device when the cover **320** is placed into electrical contact with the external device. The third interchangeable accessory cover **320** may have a portion provided in the form of a plate for placement on the back of the device case. The plate of the accessory cover **320** has an inner surface **321** (see FIG. **3**H) and an outer surface **322** (see FIG. **3**A), and a clip **324** connected or attached thereto. Like accessory cover **120**, the plate of the accessory cover **320** may include a beveled edge that is provided at an angle **3**. In an embodiment, the plate itself, its inner surface **321**, and/or outer surface **322** may be similarly shaped to the housing of device case **110**—or at least its back plate **132**—for example, both have a substantially circular shape or any other shape (e.g., square, rectangular, oval, etc.) that correspond to each other. In one embodiment, the plate associated with cover **320** is substantially disc shaped.

[0086] In addition, the interchangeable accessory cover **320** may include a projection **331** (see FIG. **3**H) that is similar to projection **123**, for alignment with a recess (not shown in FIG. **3**A) on a back portion of the device case **110**, in accordance with an embodiment. It should be understood that the device case **110** may include a recess similar to recess **134** that is similar in shape and size as the projection **331**. Furthermore, the third interchangeable accessory cover **320** may also include one or more holes **321** that may be aligned with the receiving holes **138** on the back plate **132** of the device case **110** in a similar manner as described with respect to holes **128** of accessory cover **120**. The holes **321** may be configured to receive screws **122** (see FIG. **3**G) therethrough that are screwed into and secured onto threads of the receiving holes **138**, thereby securing the interchangeable accessory cover **320** to the device case **110**. The holes **321** may be provided as an alternative to or without the projection **331** shown in the cover **320**, in accordance with an embodiment. Of course, the use of holes and screws as the removable attachment mechanism for interchangeable accessory cover **320** is not intended to be limiting. As described in detail previously with regards to FIGS. **6**A through **10**B, it should be appreciated that the third interchangeable accessory cover **320** is not limited to screw-type attachment and may be modified to use other means of removable attachments such as those described with reference thereto.

[0087] As such, it should be understood that the second interchangeable accessory cover **220** may not only be used with the device case **110**, but it may replace the (first) interchangeable accessory cover **120**, or vice-versa. Each of the covers **120** and **220** may be removed and replaced with the other. Accordingly, the accessory associated with the device case **110** may be changed for the wearable device so that it may be worn on different parts of a user's body.

[0088] An electrical connector portion or electrical contact portion **325**, which is equivalent to the previously described electrical contact portion **125** and its embodiments, is disposed on the outer surface **322** of the accessory cover **320**. As shown in FIGS. **3**A, **3**G, and **3**H, for example, in one embodiment, the interchangeable accessory cover **320** has its own an electrical contact portion **325** that has one or more electrical contact points. The electrical contact portion **325** may be provided in an area **335** on the accessory cover **320** that may be configured for alignment relative to a location of the electrical connector portion **155**, in accordance with an embodiment. In one embodiment, the electrical contact points extend between the front portion or inner surface **321** and the back portion or outer surface **322**, such that the electrical contact points are accessible via the outer surface **322**/back portion when the interchangeable accessory cover **320** is attached to the device case **110**. In another embodiment, holes are provided for receipt of wires therein. Since the features relating to electrical contact portion **325** are similar to the electrical contact portion **125** (e.g., use of wires, four electrical wire contact points, functions (charging, data transfer), etc.) which are described in detail above with respect to FIGS. **1**A-**1**J, they are not all necessarily repeated here. Nonetheless, it should be understood that the accessory cover **320** may include any number of features described with reference to electrical contact portion **125**.

[0089] The electrical contact points of the electrical contact portion **325** of the accessory cover **320** may be configured for alignment with the wires of the electrical connector portion **155** on the device case **110** such that they are in electrical communication. In one embodiment, part of the electrical contact portion **325** may be placed in direct contact with the electrical connector portion **155**. Accordingly, an electrical connection between the processor **150** and the external device may be established using the electrical contact points of electrical contact portion **325**. Measurements collected by the measurement device(s) **140** or sensor (s) and processed by the processor **150** may be communicated to the external device via the interchangeable accessory cover **320**. In addition, data or information may be communicated to the processor **150** and/or electrical components of the wearable device **300** from the external device via using the electrical contact portion **325** of the accessory cover **320**.

[0090] Of course, it should also be noted that in yet another embodiment, instead of providing electrical contact portion **325**, the accessory cover **320** may include an opening, a hole, a cutout portion, or a shape for allowing access to the electrical connector portion **155** of the device case **110** when the cover **320** is attached thereto, as previously described.

[0091] The materials and manufacturing methods used to form the interchangeable accessory cover **320** are not limited. The accessory cover **320** may be made of similar material as the device case **110**, for example, aluminum, steel, gold, silver, other metallic material, plastic, and formed using a similar manufacturing process, e.g., injection molding or casting. In an embodiment, the accessory cover **320** may be made of a different material than the housing of the device case **110**. Also, the accessory cover **320** may be formed from multiple materials.

[0092] The clip **324** may be a spring-type belt clip or holster clip that includes a resilient spring arm or similar resilient and flexible member, configured to move relative to a back of the plate of the accessory cover **320** to receive and secure a piece of clothing between the arm/member and a back surface of the accessory cover **320**. For example, the wearable device **300** may be attached to a belt or a portion of a shirt or pants of a user. As shown in the figures, the clip **324** is provided in its original position (i.e., not in use or grasping clothing).

[0093] The clip **324** may have a first arm or leg **324***a*, a second arm or leg **324***b*, and a curved portion **324***c* connecting the two legs **324***a* and **324***b*. The first leg **324***a* is configured to move relatively away from the outer surface **322**, and the second leg **324***b*, to receive a piece of clothing therein, for example.

[0094] The second leg **324***b* may be the portion that attaches the clip **324** to the accessory cover **320**. The second leg **324***b* may be integrally formed with the accessory cover **320**, for example, by molding and/or soldering, or fixedly attached, e.g., via adhesive, to a perimeter of the outer surface **322** of the interchangeable accessory cover **320**. In one embodiment, the second leg **324***b* is secured to or in a receiving area provided along the perimeter or beveled edge of the cover **320**. As seen in FIG. **3**E, the second leg **324***b* may project or extend outwards (e.g., in a vertical direction or y-direction) from the beveled edge of the accessory cover **320**. The second leg **324***b* may be parallel to a plane across the outer surface **322**, for example. The curved portion **324***c* may be generally C-shaped, U-shaped, or even V-shaped and is spaced from the edge **106** of the device case. The curved portion **324***c* positions the first leg **324***a* adjacent to outer surface **322**, such that there is an angle θ with respect to the second leg **324***b* (the angle θ being between the inner facing surfaces of each of the legs). When the first leg **324***a* is moved relatively away from the outer surface **322** (and thus the second leg **324***b*), the angle therebetween increases. However, the curved portion **324***c* is designed to be resilient so that it pulls the first leg **324***a* back towards the second leg **324***b*, in some cases back to angle θ. In accordance with an embodiment, the clip **324** may be made from a resilient material such that the curved portion **324***c* encourages any relative movement of the first leg **324***a* away from the outer surface **322** and second leg **324***b* back towards its original position.

[0095] Furthermore, in an embodiment, the first leg **324***a* may include an end portion **326** (see FIGS. **3**A and **3**G) that has an inner surface configured to rests on the outer surface **322** of the third interchangeable accessory cover **320** in its original position. In an embodiment, the end portion **326** may larger in size and different (or similar) in shape compared to the first leg **324***a*. For example, the end portion **326** may be substantially circular in shape, while the first and second legs **324***a* and **324***b* are linear. Such an end portion **326** provides a larger contact surface for grasping clothing between the outer surface **322** and end portion **326**, for example. Of course, the shape of the end portion **326** is exemplary only and not intended to be limiting. The end portion **326** may also include a bent portion **328** that is angled or extends away from the outer surface **322**, as seen in FIG. **3**F, for example, in one embodiment. The bent portion **328** assists a user in grasping the first legs **324***a* of the clip **324** such that it may be moved away from the outer surface **322** for receipt of a piece of clothing. In an embodiment, the end portion **326** is positioned such that its center aligns with a center of the device case **110**, e.g., a center point of the vertical and horizontal centerlines that extend in the Y- and X-directions. In one embodiment, the bent portion **328** may be positioned below the horizontal centerline (see FIG. **3**G).

[0096] Accordingly, to secure the wearable device **300** to a user, the end portion **326** is moved away from the outer surface **322**, thereby allowing a piece of clothing or belt to slide (e.g., in vertical direction) between the outer surface **322** and the first leg **324***a* and towards the curved portion **324***c*. In an embodiment, the resiliency of at least the first leg **324***a* and curved portion **324***c* of the clip **324** secures the clothing or belt therein.

[0097] Furthermore, in an embodiment, the clip **324** may be configured to be removably attached to the outer surface **322** of the third interchangeable accessory cover **320**. For example, the second leg **324***b* may be snap fitted, screwed or attached by other removable fastening methods. In an embodiment, the third interchangeable accessory cover **320** may include tracks **350** to allow relative motion between the clip **324** and the interchangeable accessory cover **320**, such that the clip **324** may be moved along the perimeter of the outer surface **322** of the interchangeable accessory cover **320**.

[0098] Although the clip **324** of the third interchangeable accessory cover **320** is shown in the Figures such that, in an embodiment, the second leg **324***b* of the clip **324** is generally aligned with the orientation indicator **115** in the 12 o'clock position when the cover **320** is attached to the device case **110**, the placement of the clip **324** along an edge of the plate of the cover **320** is not limited except for allowing access to the electrical contact portion **325**. That is, since electrical contact portion **325** is used to establish a connection between the processor **150** of the device case **110** and an external device, it must be accessible. Accordingly, a portion (e.g., **324***a*) of the clip **324** should not cover or limit access to the electrical contact points of the electrical contact portion **325**.

[0099] In accordance with another embodiment, a fourth interchangeable accessory cover **420** may be used along with device case **110** as shown in FIGS. **4**A-**4**G, forming a wearable device **400**. Much like interchangeable accessory cover **120**, interchangeable accessory cover **420** is configured to provide accessibility to the electrical connector portion **155** on the back of the device case **110** when attached thereto. In one embodiment, the device case **110** and the accessory cover **420** may be communicably coupled to each other such that the wearable device **400** may establish an electrical connection as well as communication link with an external device when the cover **400** is placed into electrical contact with the external device. The fourth interchangeable accessory cover **420** may have a portion provided in the form of a plate for placement on the back of the device case. The plate of the accessory cover **420** has an inner surface **421** (see FIG. **4**B) and an outer surface **422** (see FIG. **4**A). Pairs of lugs that are part of watch lug portions **424** and **434** (described later below) are connected or attached to the plate of the cover **420**. In an embodiment, the plate itself, its inner surface **421**, and/or outer surface **422** may be similarly shaped to the housing of device case **110**—or at least its back plate **132**—for example, both have a substantially circular shape or any other shape (e.g., square, rectangular, oval, etc.) that correspond to each other. In one embodiment, the plate associated with cover **420** is substantially disc shaped.

[0100] In addition, although not shown in the Figures, it should be understood that the interchangeable accessory cover **420** may include a projection, that is similar to projection **123**, for alignment with a recess (also not shown), similar to recess **134**, on a back portion of the device case **110**, in accordance with an embodiment. Furthermore, the fourth interchangeable accessory cover **420** may also include one or more holes **440** that may be aligned with the receiving holes **138** on the back plate **132** of the device case **110** in a similar manner as described with respect to holes **128** of accessory cover **120**. The holes **440** may be configured to receive screws **122** (see FIG. **4**F) therethrough that are screwed into and secured onto threads of the receiving holes **138** to secure the interchangeable accessory cover **420**

to the device case **110**. Of course, the use of holes and screws as the removable attachment mechanism for interchangeable accessory cover **420** is not intended to be limiting, and any other mechanism including those described in detail previously with regards to FIGS. **6**A through **10**B may be used.

[0101] As such, it should be understood that the fourth interchangeable accessory cover **420** may be used with the device case **110**, as well as to replace any other interchangeable accessory cover **120**, **220**, and/or **320**, or vice-versa. In this case, the accessory associated with the device case **110** may be changed such that it forms the wearable device **400** for placement around a user's wrist.

[0102] An electrical connector portion or electrical contact portion **425**, which is equivalent to the previously described electrical contact portion **125** and its embodiments, is disposed on the outer surface **422** of the accessory cover **420**. As shown in FIGS. **4**A, **4**B, and **4**F, for example, in one embodiment, the interchangeable accessory cover **420** has its own an electrical contact portion **425** that has one or more electrical contact points. The electrical contact portion **425** may be provided in an area **435** on the accessory cover **420** that may be configured for alignment relative to a location of the electrical connector portion **155**, in accordance with an embodiment. In one embodiment, the electrical contact points extend between the front portion or inner surface **421** and the back portion or outer surface **422**, such that the electrical contact points are accessible via the outer surface **422**/back portion when the interchangeable accessory cover **420** is attached to the device case **110**. In another embodiment, holes are provided for receipt of wires therein. Since the features relating to electrical contact portion **425** are similar to the electrical contact portion **125** (e.g., use of wires, four electrical wire contact points, functions (charging, data transfer), etc.) which are described in detail above with respect to FIGS. **1**A-**1**J, they are not all necessarily repeated here. Nonetheless, it should be understood that the accessory cover **420** may include any number of features described with reference to electrical contact portion **125**.

[0103] The electrical contact points of the electrical contact portion **425** of the accessory cover **420** may be configured for alignment with the wires of the electrical connector portion **155** on the device case **110** such that they are in electrical communication. In one embodiment, part of the electrical contact portion **425** may be placed in direct contact with the electrical connector portion **155**. Accordingly, an electrical connection between the processor **150** and the external device may be established using the electrical contact points of electrical contact portion **425**. Measurements collected by the measurement device(s) **140** or sensor (s) and processed by the processor **150** may be communicated to the external device via the interchangeable accessory cover **420**. In addition, data or information may be communicated to the processor **150** and/or electrical components of the wearable device **400** from the external device via using the electrical contact portion **425** of the accessory cover **420**.

[0104] Of course, it should also be noted that in yet another embodiment, instead of providing electrical contact portion **425**, the accessory cover **420** may include an opening, a hole, a cutout portion, or a shape for allowing access to the electrical connector portion **155** of the device case **110** when the cover **420** is attached thereto, as previously described with reference to cover **120**.

[0105] Watch lug portions **424** and **434** are of generally similar construction and configured to receive and secure a band **430** (shown in FIGS. **4**C-**4**F) in order to facilitate a user wearing of the wearable device **400** on a wrist, an arm, and/or other body parts. In an embodiment, the lug portions **424** and **434** are located diametrically opposite to each other. Each watch lug portion **424** and **434** has a base portion **424***d* and **434***d*, respectively, that extends or projects from the plate of the accessory cover **420**, and a pair of lugs **424***a*, **424***b* and **434***a*, **434***b*, respectively.

[0106] In the illustrated embodiment, the base portions **424***d* and **434***d* (and thus the pairs of lugs) extend both in the Y-direction (or vertically) and the Z-direction (or axially), when viewed in the X-direction (see FIG. **4**G). In an embodiment, the back surface of each base portion **424***d* and **434***d* may be aligned with and provided in the same plane of the outer surface **422** (see FIG. **4**D), thus extending outward (e.g., in a vertical direction or y-direction) and increasing a surface area of the back portion of the accessory cover **420**. In an embodiment, the front surface of each base portion **424***d* and **434***d* may be positioned such that it extends from the edge **106** of the device case **110** when assembled thereto.

[0107] As shown in FIG. **4**B, in accordance with an embodiment, each base portion **424***d* and **434***d* may include a curved surface **424***c* and **434***c*, respectively, that extends forwardly from the inner surface **421**. The curved surfaces **424***c* and **434***c* each have an arc or a curvature that cooperates or confirms with the sides or edge **106** of the device case **110**. Accordingly, when the accessory cover **420** is attached to the device case **110**, the curved surfaces **424***c* and **434***c* may be provided along or against the perimeter or edge **106** of the device case **110**.

[0108] Each lug **422***a*, **424***b* and **434***a*, **434***b* may extend in a generally perpendicular direction (e.g., in a vertical direction or Y-direction) relative to edge **106**, for example, in the wearable device **400**. Referring specifically to the base portion **424***d*, as shown in **4**C, for example, the pair of lugs **424***a* and **424***b* at the top end of the accessory cover **420** are spaced from one another, e.g., at either side (right and left) of the base portion **424***d*. A space between the pair of lugs **424***a* and **424***b* is configured for receipt of an end of a watch band **430**, for example. Specifically, each lug **424***a* and **424***b* has a receiving hole therein that is configured to receive an end or a portion of a removable pin **426** therein. The receiving holes are provided in the internal surfaces of the lugs **424***a* and **424***b* (i.e., the surfaces that are facing each other), and are horizontally aligned. The receiving holes may be through holes or blind holes in each of the lugs. In another embodiment, the receiving holes may be provided as dimples that are horizontally aligned with each other. To attach a band **430**, the pin **426** may be placed through a through hole (not shown) on one end of the band **430**, and its ends may be inserted and secured in the receiving holes of the lugs **424***a* and **424***b*.

[0109] The base portion **434***d*, also shown in FIG. **4**C, includes its pair of lugs **434***a* and **434***b* positioned at the bottom end of the accessory cover **420**. Similar to base portion **424***d*, lugs **434***a* and **434***b* of base portion **434***d* are spaced from one another, e.g., at either side (right and left) of the base portion **434***d*, for receipt of another end of the band therebetween, for example. Lugs **434***a* and **434***b* also have receiving holes or dimples provided therein as described above (and thus not repeated here) for placement of a removable pin **436** therein. To attach the other end of the

band **430**, then, the pin **436** may be placed through a through hole (not shown) on the other/opposite end of the band **430**, and its ends may be inserted and secured in the receiving holes of the lugs **434***a* and **434***b*.

[0110] In an embodiment, gaps **428** and **438** (shown in FIG. **4**A) are provided between the pins **426** and **436** and a top surface of the base portions **424***d* and **434***d*, respectively, to accommodate the ends of the band.

[0111] In one embodiment, the pins **426** and **436** may each be a spring loaded shaft that is configured to compress in some manner, to allow ends of the pins **426** and **436** to be inserted within the receiving holes/dimples before expanding to its original length.

[0112] In an embodiment, the lug portions **424** and **434** may be integrally formed with the plate and/or its outer surface **422** (e.g., via molding) or attached thereto (e.g., by molding, soldering, or adhesive) to from an integral structure. However, the materials and manufacturing methods used to form the interchangeable accessory cover **420** are not limited. The accessory cover **420** may be made of similar material as the device case **110**, for example, aluminum, steel, gold, silver, other metallic material, plastic, and formed using a similar manufacturing process, e.g., injection molding or casting. In an embodiment, the accessory cover **420** may be made of a different material than the housing of the device case **110**. Also, the accessory cover **420** may be formed from multiple materials. Additionally, any type of band **430** may be used with wearable device **400**. The band **430** may be formed from leather, plastic, or cloth materials, for example.

[0113] FIG. **5**A is an exploded, back side angled view of a fifth interchangeable accessory cover **520** and device case **110** forming a wearable device **500**, according to still yet another embodiment of this disclosure. FIGS. **5**B-**5**G illustrate an exploded, front side angled view, a front, a second (right) side, a front perspective, and a back perspective views, respectively, of the wearable device **500**. Much like interchangeable accessory cover **120**, interchangeable accessory cover **520** is configured to provide accessibility to the electrical connector portion **155** on the back of the device case **110** when attached thereto. In one embodiment, the device case **110** and the accessory cover **520** may be communicably coupled to each other such that the wearable device **500** may establish an electrical connection as well as communication link with an external device when the cover **500** is placed into electrical contact with the external device. Like accessory cover **420**, the fifth interchangeable accessory cover **520** may have a portion provided in the form of a plate for placement on the back of the device case. The plate of the accessory cover **520** has an inner surface **521** (see FIG. **5**B) and an outer surface **522** (see FIG. **5**A). Pairs of lugs that are part of watch lug portions **524** and **534** (described later below) are connected or attached to the plate of the cover **520**. In an embodiment, the plate itself, its inner surface **521**, and/or outer surface **522** may be similarly shaped to the housing of device case **110**—or at least its back plate **132**—for example, both have a substantially circular shape or any other shape (e.g., square, rectangular, oval, etc.) that correspond to each other. In one embodiment, the plate associated with cover **520** is substantially disc shaped.

[0114] In addition, as shown in FIG. **5**B, for example, it should be understood that the interchangeable accessory cover **520** may include a projection **523**, that is similar to projection **123**, for alignment with a recess (shown in phantom in FIG. **5**G, but not shown in FIG. **5**A), similar to recess **134**, on a back portion of the device case **110**, in accordance with an embodiment. Furthermore, the interchangeable accessory cover **520** may also include one or more holes **540** that may be aligned with the receiving holes **138** on the back plate **132** of the device case **110** in a similar manner as described with respect to holes **128** of accessory cover **120**. The holes **540** may be configured to receive screws **122** (see FIG. **5**F) therethrough that are screwed into and secured onto threads of the receiving holes **138** to secure the interchangeable accessory cover **520** to the device case **110**. Of course, the use of holes and screws as the removable attachment mechanism for interchangeable accessory cover **520** is not intended to be limiting, and any other mechanism including those described in detail previously with regards to FIGS. **6**A through **10**B may be used.

[0115] As such, it should be understood that the fifth interchangeable accessory cover **520** may be used with the device case **110**, as well as to replace any other interchangeable accessory cover **120**, **220**, **320**, and/or **420**, or vice-versa. In this case, the accessory associated with the device case **110** may be changed such that it forms the wearable device **500** for placement around a user's wrist.

[0116] An electrical connector portion or electrical contact portion **525**, which is equivalent to the previously described electrical contact portion **125** and its embodiments, is disposed on the outer surface **522** of the accessory cover **520**. As shown in FIGS. **5**A, **5**B, and **5**F, for example, in one embodiment, the interchangeable accessory cover **520** has its own an electrical contact portion **525** that has one or more electrical contact points. The electrical contact portion **525** may be provided in an area **535** on the accessory cover **520** that may be configured for alignment relative to a location of the electrical connector portion **155**, in accordance with an embodiment. In one embodiment, the electrical contact points extend between the front portion or inner surface **521** and the back portion or outer surface **522**, such that the electrical contact points are accessible via the outer surface **522**/back portion when the interchangeable accessory cover **520** is attached to the device case **110**. In another embodiment, holes are provided for receipt of wires therein. Since the features relating to electrical contact portion **525** are similar to the electrical contact portion **125** (e.g., use of wires, four electrical wire contact points, functions (charging, data transfer), etc.) which are described in detail above with respect to FIGS. **1**A-**1**J, they are not all necessarily repeated here. Nonetheless, it should be understood that the accessory cover **520** may include any number of features described with reference to electrical contact portion **125**.

[0117] The electrical contact points of the electrical contact portion **525** of the accessory cover **520** may be configured for alignment with the wires of the electrical connector portion **155** on the device case **110** such that they are in electrical communication. In one embodiment, part of the electrical contact portion **525** may be placed in direct contact with the electrical connector portion **155**. Accordingly, an electrical connection between the processor **150** and the external device may be established using the electrical contact points of electrical contact portion **525**. Measurements collected by the measurement device(s) **140** or sensor (s) and processed by the processor **150** may be communicated to the external device via the interchangeable accessory cover **520**. In addition, data or information may be communicated to the processor **150** and/or electrical com-

ponents of the wearable device **400** from the external device via using the electrical contact portion **525** of the accessory cover **520**.

[0118] Of course, it should also be noted that in yet another embodiment, instead of providing electrical contact portion **525**, the accessory cover **520** may include an opening, a hole, a cutout portion, or a shape for allowing access to the electrical connector portion **155** of the device case **110** when the cover **520** is attached thereto, as previously described with reference to cover **120**.

[0119] Watch lug portions **524** and **534** are of generally similar construction and configured to receive and secure a band **520** (shown in FIGS. **5**C-**5**F) in order to facilitate a user wearing of the wearable device **500** on a wrist, an arm, and/or other body parts. In an embodiment, the lug portions **524** and **534** are located diametrically opposite to each other. Each watch lug portion **524** and **534** has a pair of lugs **524***a*, **524***b* and **534***a*, **534***b*, respectively, which extend or project from the plate of the accessory cover **520**. In one embodiment, the lugs **524***a*, **524***b* and **534***a*, **534***b* are accessible via the back of the accessory cover **520**.

[0120] In accordance with one embodiment, watch lug portions **524** and **534** are similar to watch lug portions **424** and **434** of the fourth interchangeable accessory cover **420**. In another embodiment, each of the watch lug portions **524** and **534** include bridge portions between their lugs and a sensor. Such an example is further described below.

[0121] In the illustrated embodiment, the watch lug portions **524** and **534** (and thus their pairs of lugs) extend both in the Y-direction (or vertically) and the Z-direction (or axially), when viewed in the X-direction (see FIG. **5**G). Each pair of lugs **524***a*, **524***b* and **534***a*, **534***b* may be connected by a bridge portion **524***d* and **534***d*, respectively, as shown in FIG. **5**A. Generally, the watch lug portions **524** and **534** extend outward (e.g., in a vertical direction or Y-direction) from the plate or outer surface **522**, while the bridge portions **524***d* and **534***d* extend in generally horizontal direction that is parallel to the horizontal centerline (see FIG. **5**C) of the wearable device **500**. In an embodiment, the front surface of each base portion **424***d* and **434***d* may be positioned such that it extends from the edge **106** of the device case **110** when assembled thereto.

[0122] As shown in FIG. **5**B, in accordance with an embodiment, each watch lug portion **524** and **534** may include a curved surface **524***c* and **534***c*, respectively, that extends forwardly from the inner surface **521**. The curved surfaces **524***c* and **534***c* each have an arc or a curvature that cooperates or confirms with the sides or edge **106** of the device case **110**. Accordingly, when the accessory cover **520** is attached to the device case **110**, the curved surfaces **524***c* and **534***c* may be provided along or against the perimeter or edge **106** of the device case **110**.

[0123] Generally each lug **524***a*, **524***b* and **534***a*, **534***b* may extend in a generally perpendicular direction (e.g., in a vertical direction or Y-direction) relative to edge **106**, for example, in the wearable device **500**. The pair of lugs **524***a* and **524***b* at the top end of the accessory cover **520**, as shown in FIG. **5**A, are spaced from one another, e.g., at either side (right and left). A space between the pair of lugs **524***a* and **524***b* is configured for receipt of an end of a watch band **530**, for example. Specifically, each lug **524***a* and **524***b* has a receiving hole therein that is configured to receive an end or a portion of a pin **526** therein. The receiving holes are provided in the internal surfaces of the lugs **524***a* and **524***b* (i.e., the surfaces that are facing each other), and are horizontally aligned. The receiving holes may be through holes or blind holes in each of the lugs. In another embodiment, the receiving holes may be provided as dimples that are horizontally aligned with each other. Similarly, the pair of lugs **534***a* and **534***b* positioned at the bottom end of the accessory cover **520** such that the lugs **534***a* and **534***b* are spaced from one another, e.g., at either side (right and left) and configured, for receipt of another end of the band therebetween, for example. Lugs **534***a* and **534***b* also have receiving holes or dimples provided therein as described above (and thus not repeated here) for placement of a pin **536** therein.

[0124] In an embodiment, gaps **527** and **537** (shown in FIG. **5**A) are provided between the pins **526** and **536** and an edge surface on the watch lug portions **524** and **534**, respectively, to accommodate the ends of the band. Gaps **528** and **538** may also be provided between the pins **526** and **536** and a surface of the bridge portions **524***d* and **534***d*.

[0125] In accordance with one embodiment, to attach a band **530**, the pin **526** may be placed through a through hole (not shown) on one end of the band **530**, and its ends may be inserted and secured in the receiving holes of the lugs **524***a* and **524***b*. Pin **536** may be placed through a through hole (not shown) on the other end of the band **530**, and its ends may be inserted and secured in the receiving holes of the lugs **534***a* and **534***b*. In one embodiment, the pins **526** and **536** may each be a spring loaded shaft that is configured to compress in some manner, to allow ends of the pins **526** and **536** to be inserted within the receiving holes/dimples before expanding to its original length.

[0126] In another embodiment, the pins **526** and **536** may be secured within and between the lugs **524***a*, **524***b* and **534***a*, **534***b*. In such a design, the pins **526** and **536** support to a band **530** whose respective ends are fed through gaps **527**, **528** and **537**, **538** in order to wrap each end portion of the band around the respective pin **526** or **536**, for example.

[0127] In accordance with one embodiment, interchangeable accessory cover **520** further includes sensors and/or measurements devices associated therewith, for sensing and collecting measurements and data from the user and sending it to processor **150**. For example, as shown in FIG. **5**A, one or more sensors, including portions S**1**, S**2**, and S**3**, are disposed on the outer surface **522** of the accessory cover **520**, in accordance with an embodiment. In an embodiment, shown in FIG. **5**C, sensors S**4** and S**5** are provided on lug portions **524** and **525**. Each of the sensors is configured to communicate with the processor **150** via the electrical contact portion **525** and electrical connector portion **155**, for example, in one embodiment. In another embodiment, one or more of the sensors may be configured to communicate wirelessly with the processing circuitry **150** of the device case **110**. Each of the sensors may be a physiological sensor such as a heart rate sensor, a blood sugar level sensor, a temperature sensor, a skin conductivity sensor, an electrocardiograph sensor, or other biological or physiological sensors.

[0128] In one embodiment, portions S**1**-S**3** are part of a heart rate sensor that is provided within the accessory cover **520**, while sensors S**4** and S**5** are electrodes used to measure skin conductivity and electricity (for example, ECG).

[0129] In an embodiment, one or more sensors are contained within the accessory cover **520**. For example, the accessory cover **520** may include a housing to contain a

sensor or sensor related parts therein. The housing may be perceived as a protuberance **550** (e.g., see FIGS. **5**D and **5**G) extending from the outer surface **522** of the accessory cover **520**. Portions S**1**, S**2**, and S**3** are provided on a back surface of the protuberance **550** or house and may include windows for optical sensors that may be used for heart rate and/or blood pressure monitoring, for example. Light sources, e.g., LEDs (e.g., red and green lights), and/or photodetectors may be contained in the protuberance **550** and used sensing devices. A printed circuit board (PCB) may also be provided in the housing or protuberance **550** that is associated with sensor portions such as the light source(s) and photodetector. When the protuberance **550** and thus sensor portions S**1**, S**2**, and S**3** are placed against a user's skin (e.g., on the wrist or arm area), the light source(s), photodetector, and PCB may be used to detect a user's heart rate, for example. A number of additional health related measurements or data may be calculated using the sensed data. Such functions and parts associated with these type of heart rate sensors and monitors are generally known by one of ordinary skill in the art, and thus not further explained here.

[0130] In accordance with an embodiment, communication between any PCB or sensing device contained within the housing or protuberance **550** and processor **150** of device case **110** is established via electrical contact portion **125** and electrical connector **155**.

[0131] FIGS. **5**B and **5**C best illustrate an example of sensors S**4** and S**5** provided on a front of each of the lug portions **524** and **534** of the accessory device **520**. Sensors S**4** and S**5** are generally rectangular in shape, but may be sized or altered in shape based on the size and shape of the lug portions **524** and **534**. The sensors S**4** and S**5** may be electrically connected with a PCB contained with the housing of accessory cover **520** (e.g., in protrusion **550**), in accordance with an embodiment. Sensors S**4** and S**5** may communicate with the PCB or with processor **150** of the device case **110**. As noted above, sensors S**4** and S**5** may be electrodes used to measure skin conductivity and electricity. In accordance with an embodiment, communication between sensors S**4** and S**5** and processor **150** of device case **110** may be established via electrical contact portion **125** and electrical connector **155**.

[0132] In an embodiment, the lug portions **524** and **534** may be integrally formed with the plate and/or its outer surface **522** (e.g., via molding) or attached thereto (e.g., by molding, soldering, or adhesive) to from an integral structure. However, the materials and manufacturing methods used to form the interchangeable accessory cover **520** are not limited. The accessory cover **520** may be made of similar material as the device case **110**, for example, aluminum, steel, gold, silver, other metallic material, plastic, and formed using a similar manufacturing process, e.g., injection molding or casting. In an embodiment, the accessory cover **520** may be made of a different material than the housing of the device case **110**. Also, the accessory cover **520** may be formed from multiple materials. Additionally, any type of band **530** may be used with wearable device **500**. The band **530** may be formed from leather, plastic, or cloth materials, for example.

[0133] As noted throughout, any of the alternate designs and/or mechanical mechanisms for attaching device case **110** and an interchangeable accessory cover may be provided on any one or more of the other exemplary covers **120**, **220**, **320**, **420**, and **520** described herein, such that they may be attached to the device case **110** form the wearable device.

[0134] In an embodiment, the mechanical mechanisms may vary between each type of accessory cover. For example, in one embodiment, two or more interchangeable accessory covers may be provided with device case **110**. In one embodiment, the at least two interchangeable accessory covers have different types of mechanical mechanisms for connecting the respective accessory cover to the device case **110** (e.g., one has screws and holes, while the other has a snap-fit connection). In another embodiment, the at least two interchangeable accessory covers each have a mechanical mechanism for connecting the respective accessory cover to the device case, and the mechanical mechanisms are of the same type (e.g., screws and holes).

[0135] More than one interchangeable cover may be provided with the device case **110**, for sale as a system. In one embodiment, such a system may include a device case, a first type of interchangeable accessory cover, and a second type of interchangeable accessory cover, wherein the second interchangeable accessory cover has a different configuration than the first interchangeable accessory cover, but both are configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto. For example, one of the accessory cover may be similar to cover **120**, while the other includes a necklace attachment portion **202**, a clip **324**, pairs of watch lugs to connect with a band or strap, and/or one or more physiological sensors. In one embodiment, a third interchangeable accessory cover adapted to be removably attached to the device case may be included in the system that has a different configuration than both the first and second types of covers. In another embodiment, the wearable device may be provided or sold with one type of accessory cover, and other types of accessory covers may be obtained or purchased.

[0136] In an embodiment, any one or more (or all) of the herein disclosed interchangeable accessory covers **120**, **220**, **320**, **420**, and/or **520** may include a cutout portion providing access to the electrical connectors **125** of the device case. In accordance with an embodiment, the cutout portion may be provided in or on an accessory cover without its corresponding electrical contact portion (**125**, **225**, **325**, **425**, and/or **525**). The cutout portion of the interchangeable accessory cover may be at a location corresponding to the electrical connector portion **155** of the device case **110**. For example, the area **135**, **235**, **335**, **435**, and/or **535** for the electrical contact portions may instead be a cutout portion. Accordingly, in an embodiment, instead of providing the accessory cover with its electrical contacts, the cutout portion may be aligned with respect to the electrical connector portion **155** to provide accessibility to the electrical connector portion **155** on the back of the device case **110** when attached thereto. For example, in one embodiment, the cutout portion may be located near or at the perimeter or edge of the interchangeable accessory cover. In an embodiment, the cutout portion may cut through the perimeter or edge of the interchangeable accessory cover (e.g., extend from the edge and into the outer surface in an axial direction, e.g., in the X direction). In another embodiment the cutout portion, for example, includes a hole or opening that may be located near the perimeter or edge of the cover, but does not cut through the perimeter or edge (i.e., the edge defines the hole or opening). In an embodiment, the interchangeable accessory

cover may be shaped such that when its body is positioned on or attached to the device case **110**, e.g., positioned on the back of the device case **110**, the electrical connectors **155** may be accessed. For example, instead of a plate or disc, the interchangeable accessory cover may have a body that has concave edges or curved edges that, when aligned with the back of the device case **110**, provide access to back plate **132** and connector portion **155**. In one embodiment, the body of the interchangeable accessory cover has a smaller surface area than that of the back **132** of the device case **110** to provide access to the electrical connector portion **155**. In an embodiment, the interchangeable accessory cover may be placed over the device case and the attachment may be a C-shaped snap clamp that fits over the interchangeable accessory cover and snaps at the perimeter of the device case, thus securing the interchangeable accessory cover to the device case, while providing access to the electrical connectors of the interchangeable accessory cover and/or the device case.

[0137] It may be understood by a person skilled in the art that the term wearable device **100** may be used interchangeably with wearable device **200**, **300**, **400**, **500**, etc. depending on the type of the interchangeable accessory cover attached. Furthermore, the shape of the wearable device **100** is presented as being circular in the Figures by way of an example only. This disclosure should not be limited by the shape of the wearable device **100**, device case **110**, and/or interchangeable accessory covers as depicted in the Figures. In some embodiments, the wearable device **100** and its parts may be rectangular, square, triangular, ovular, or other aesthetically pleasing shapes. Furthermore, one or more interchangeable accessory covers may be modified to adopt to the desired shape of the wearable device **100**.

[0138] While the principles of the disclosure have been made clear in the illustrative embodiments set forth above, it will be apparent to those skilled in the art that various modifications may be made to the structure, arrangement, proportion, elements, materials, and components used in the practice of the disclosure.

[0139] It will thus be seen that the features of this disclosure have been fully and effectively accomplished. It will be realized, however, that the foregoing preferred specific embodiments have been shown and described for the purpose of illustrating the functional and structural principles of this disclosure and are subject to change without departure from such principles. Therefore, this disclosure includes all modifications encompassed within the spirit and scope of the following claims.

1. A wearable device comprising:

a device case comprising:

at least one measurement device and a processor for processing measurements collected by the measurement device that are enclosed within the case;

a display or screen on a front of the device case for displaying data corresponding to measurements measured by the at least one measurement device;

a first button provided on one side of the case, the first button comprising a raised, tactile portion thereon, and a second button provided on an opposite side of the case relative to the first button, the first and second buttons being configured to implement a function or an action via the processor when pressed by a user;

an electrical connector portion provided on a back of the device case that is used to establish an electrical connection between the processor and an external device such that the processor and the external device are configured for communication and measurements that are collected by the at least one measurement device and processed by the processor are communicated to the external device; and

an interchangeable accessory cover removably attached to the device case, wherein the accessory cover is configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto,

wherein the device case further comprises a pointed portion extending from a front edge thereof and over or into the display or screen on the front of the device case, acting as an orientation indicator indicating a position for viewing the display or screen, and wherein an edge of the display or screen is formed such that it includes a corresponding or complimentary shaped indentation or cutout for receiving at least a portion of the pointed portion therein.

2. The wearable device according to claim **1**, wherein the interchangeable accessory cover is configured to cover at least a portion of the back of the device case when attached to the device case.

3. The wearable device according to claim **1**, wherein the interchangeable accessory cover comprises a front portion, a back portion, and a plurality of electrical contact points, the front portion being configured for placement against a portion of the device case and the electrical contact points extending between the front portion and the back portion such that the electrical contact points are accessible via the back portion upon attachment of the interchangeable accessory cover to the device case; and

wherein the electrical contact points of the interchangeable accessory cover are configured to communicate with the electrical connector portion of the device case, such that the electrical connection between the processor and the external device is established using the electrical contact points that are accessible via the back portion of the interchangeable accessory cover.

4. The wearable device according to claim **1**, wherein the interchangeable accessory cover and the device case are attached to one another using one or more screws.

5. The wearable device according to claim **1**, wherein the interchangeable accessory cover and the device case comprise complimentary portions for attaching the interchangeable accessory cover and the device case together.

6. The wearable device according to claim **1**, wherein at least one of the interchangeable accessory cover and/or the device case comprises a snap fit connector for attaching the device case and interchangeable accessory cover together.

7. The wearable device according to claim **1**, wherein the interchangeable accessory cover comprises a necklace attachment portion extending outwardly from an edge of the interchangeable accessory cover, the necklace attachment portion having a hole therethrough.

8. The wearable device according to claim **1**, wherein the interchangeable accessory cover comprises a clip having a resilient spring arm portion configured to receive and secure a piece of clothing between the spring arm portion and a surface of the interchangeable accessory cover.

9. The wearable device according to claim 1, wherein the interchangeable accessory cover comprises pairs of watch lugs, the pairs being provided on opposite sides of the cover and projecting outwards from the device case, wherein each lug of the pairs has a receiving hole therein that is configured to receive a portion of a pin used for attaching a watch band or watch strap.

10. The wearable device according to claim 9, wherein the interchangeable accessory cover further comprises one or more physiological sensors.

11. The wearable device according to claim 10, wherein the one or more physiological sensors is selected from the group consisting of: a heart rate sensor, a skin conductivity sensor, a blood sugar level sensor, a temperature sensor, and an electrocardiograph sensor.

12. The wearable device according to claim 1, wherein the device case further comprises an audio device therein and wherein speaker holes are provided on the device case for emitting sound from the audio device.

13. (canceled)

14. The wearable device according to claim 1, wherein the device case comprises a housing that is circular in shape and wherein an outer edge of the interchangeable accessory cover is circular in shape.

15. A system comprising:

a wearable device comprising:

a device case comprising:

at least one measurement device and a processor for processing measurements collected by the measurement device that are enclosed within the case;

a display or screen on a front of the device case for displaying data corresponding to measurements measured by the at least one measurement device;

a first button provided on one side of the device case, the first button comprising a raised, tactile portion thereon, and a second button provided on an opposite side of the device case, relative to the first button, the first and second buttons being configured to implement a function or an action via the processor when pressed by a user; and

an electrical connector portion provided on a back of the device case that is used to establish an electrical connection between the processor and an external device such that the processor and the external device are configured for communication and measurements that are collected by the at least one measurement device and processed by the processor are communicated to the external device;

a first interchangeable accessory cover adapted to be removably attached to the device case, wherein the first interchangeable accessory cover is configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto; and

a second interchangeable accessory cover also adapted to be removably attached to the device case, the second interchangeable accessory cover having a different configuration than the first interchangeable accessory cover, wherein the second interchangeable accessory cover is also configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto.

16. The system according to claim 15, wherein each of the first and second interchangeable accessory covers are configured to cover at least a portion of the back of the device case when either is attached to the device case.

17. The system according to claim 15, wherein each of the first and second interchangeable accessory covers comprises a front portion, a back portion, and a plurality of electrical contact points, the front portion being configured for placement against a portion of the device case and the electrical contact points extending between the front portion to the back portion such that the electrical contact points are accessible via the back portion upon attachment of the interchangeable accessory cover to the device case; and

wherein the electrical contact points of each of the first and second interchangeable accessory covers are configured to communicate with the electrical connector portion of the device case, such that the electrical connection between the processor and the external device is established using the electrical contact points that are accessible via the back portion of the respective interchangeable accessory cover.

18. The system according to claim 15, wherein the each of the first and second interchangeable accessory covers have a mechanical mechanism for connecting the respective accessory cover to the device case, and wherein the mechanical mechanisms are of the same type.

19. The system according to claim 15, wherein the each of the first and second interchangeable accessory covers have a mechanical mechanism for connecting the respective accessory cover to the device case, and wherein the mechanical mechanisms are of a different type.

20. The system according to claim 15, wherein one of the first and second interchangeable accessory covers includes a necklace attachment portion extending outwardly from an edge of the interchangeable accessory cover, the necklace attachment portion having a hole therethrough.

21. The system according to claim 15, wherein one of the first and second interchangeable accessory covers includes a clip having a resilient spring arm portion configured to receive and secure a piece of clothing between the spring arm portion and a surface of the interchangeable accessory.

22. The system according to claim 15, wherein one of the first and second interchangeable accessory covers includes pairs of watch lugs, the pairs being provided on opposite sides of the cover and projecting outwards from the device case, wherein each lug of the pairs has a receiving hole therein that is configured to receive a portion of a pin used for attaching a watch band or watch strap.

23. The system according to claim 22, wherein one of the first and second interchangeable accessory covers includes one or more physiological sensors selected from the group consisting of: a heart rate sensor, a skin conductivity sensor, a blood sugar level sensor, a temperature sensor, and an electrocardiograph sensor.

24. The system according to claim 15, further comprising a third interchangeable accessory cover adapted to be removably attached to the device case, wherein the third interchangeable accessory cover is configured to provide accessibility to the electrical connector portion on the back of the device case when attached thereto, the third interchangeable accessory cover having a different configuration than both the first and second interchangeable accessory covers.

25. An interchangeable accessory cover for removable attachment to a wearable device, the wearable device comprising: a housing that contains at least one measurement

device and a processor for processing measurements collected by the measurement device, and a display or screen on a front of the housing for displaying data corresponding to measurements measured by the at least one measurement device; the accessory cover comprising:

a front portion and a back portion,

a beveled edge extending between the front portion and the back portion, and

an electrical connector portion with electrical contact points that are accessible via the back portion upon attachment to the wearable device,

wherein the electrical connector portion is configured to establish an electrical connection between the processor of the wearable device and an external device such that the processor and the external device are configured for communication and measurements that are collected by the at least one measurement device and processed by the processor are communicated to the external device via the interchangeable accessory cover.

26. The interchangeable accessory cover according to claim **25**, wherein the interchangeable accessory cover is configured to cover at least a portion of a back of the wearable device when attached thereto.

27. The interchangeable accessory cover according to claim **25**, wherein the electrical contact points extend between the front portion to the back portion; and

wherein the electrical contact points on the front portion of the interchangeable accessory cover are configured for alignment with a corresponding electrical connector on the wearable device, such that the electrical connection between the processor and the external device is established and accessible via the back portion of the interchangeable accessory cover.

28. The interchangeable accessory cover according to claim **25**, wherein the interchangeable accessory cover has holes therein for receipt of one or more screws for attachment of the cover to the wearable device.

29. The interchangeable accessory cover according to claim **25**, further comprising a threaded portion or screw portion configured for attachment to a complimentary threaded or screw portion of the wearable device.

30. The interchangeable accessory cover according to claim **25**, further comprising a snap fit connector for attaching to the wearable device.

31. The interchangeable accessory cover according to claim **25**, further comprising a necklace attachment portion extending outwardly from an edge of the interchangeable accessory cover, the necklace attachment portion having a hole therethrough.

32. The interchangeable accessory cover according to claim **25**, further comprising a clip having a resilient spring arm portion configured to receive and secure a piece of clothing between the spring arm portion and a surface of the interchangeable accessory cover.

33. The interchangeable accessory cover according to claim **25**, further comprising pairs of watch lugs, the pairs being provided on opposite sides of the cover and configured to project outwardly from the wearable device upon attachment thereto, wherein each lug of the pairs has a receiving hole therein that is configured to receive a portion of a pin used for attaching a watch band or watch strap.

34. The interchangeable accessory cover according to claim **33**, further comprising one or more physiological sensors selected from the group consisting of: a heart rate sensor, a skin conductivity sensor, a blood sugar level sensor, a temperature sensor, and an electrocardiograph sensor.

35. The interchangeable accessory cover according to claim **25**, wherein the front and back portions are similar to or the same shape as a back of the housing of the wearable device, and wherein the front portion is configured for placement against the back of the wearable device.

* * * * *

专利名称(译)	可互换的可穿戴设备		
公开(公告)号	US20190110744A1	公开(公告)日	2019-04-18
申请号	US15/787166	申请日	2017-10-18
[标]申请(专利权)人(译)	朱吉平		
申请(专利权)人(译)	朱吉平		
当前申请(专利权)人(译)	朱吉平		
[标]发明人	ZHU JIPING		
发明人	ZHU, JIPING		
IPC分类号	A61B5/00 A61B5/0205 A61B5/0404		
CPC分类号	A61B5/681 A61B5/02055 A61B5/0404 A61B5/7405 A61B5/7445 A61B5/7475 A61B5/02438 A61B5/0531 A61B5/14532 A61B2560/0443 A61B2562/227		
外部链接	Espacenet USPTO		

摘要(译)

公开了一种可穿戴设备，其具有可以可拆卸地连接到其上的不同类型的可互换配件盖。可穿戴设备具有用于进行测量（例如，用于用户健康）的处理器和传感器，以及其相对侧上的按钮，其中一个按钮包括用于区分目的的盲文。每个盖子包括不同的附件 - 例如项链附接部分，夹子，表耳，传感器或它们的组合，使得用户能够佩戴可穿戴设备的不同选择。在一种选择中，盖子附接到可穿戴设备的背面。每个盖子被配置为提供对可穿戴设备的电连接器的可接近性。在一些情况下，盖子本身包括电连接器部分，该电连接器部分用于在可穿戴设备的处理器和外部设备之间建立电连接，以通过附接的可互换附件盖子传送测量值。