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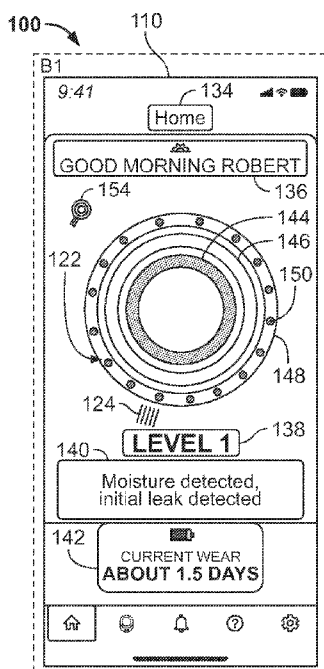


FIG. 4A

(57) Abstract: A method for displaying leakage information for an ostomy leakage detection system. The method can include a mobile device obtaining leakage data. The leakage data may include input corresponding to the detection of leakage on at least one sensing ring of a sensing accessory. The mobile device can determine a leakage summary notification for display based on the leakage data. The leakage summary notification indicates a status of the sensing accessory. The mobile device can display, on a touch screen display, the leakage summary notification.

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INTERNATIONAL PATENT APPLICATION

TITLE

**METHOD AND GRAPHICAL USER INTERFACE FOR
DETERMINING AND DISPLAYING OSTOMY LEAKAGE INFORMATION**

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**METHOD AND GRAPHICAL USER INTERFACE FOR
DETERMINING AND DISPLAYING OSTOMY LEAKAGE INFORMATION**

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit and priority of U.S. Provisional Application No. 63/510,672, entitled METHOD AND GRAPHICAL USER INTERFACE FOR DETERMINING AND DISPLAYING OSTOMY LEAKAGE INFORMATION, filed June 28, 2023, the disclosure of which is incorporated by reference herein in its entirety.

BACKGROUND

[0002] The present disclosure pertains to a method and graphic user interface for determining and displaying information corresponding with the detection of moisture and leakage around an ostomy appliance.

[0003] An ostomy pouch system typically includes a pouch formed from opposing sidewalls defining an internal collection area, an inlet opening for receiving a stoma, and an ostomy appliance for attaching the pouch to a user. The ostomy appliance may include, for example, an ostomy barrier of a one-piece pouch system, which is attached to one of the pouch sidewalls proximate an inlet opening, or a faceplate for a two-piece pouch system configured to releasably engage a pouch, and a barrier ring. The ostomy appliance may include a skin barrier material for adhering to and sealing against user's peristomal skin surrounding the stoma.

[0004] The ostomy appliance may be susceptible to ostomy effluent leakage, and the seal formed between the skin barrier material and the user may weaken. Oftentimes, the user may be unaware of, or cannot easily assess, an extent of weakening in the seal. Thus, the user may not become aware of a weakened seal, and consequently, the ostomy effluent may cause skin health

complications and may leak through to an exterior of the ostomy appliance.

[0005] Leakage detection systems may include an electronic device that processes leak data and detects leakage in ostomy appliances. The detected leakage may be communicated to a user on the electronic device or a mobile device. However, communicating leakage information to a user can be difficult. For example, the electronic device can communicate simply that a leak is detected through an alarm using sound, light, or haptic feedback. But such an alarm may not indicate what the alarm means, the severity of the detected leak, the location of the detected leak or any information or recommendations for addressing or responding to any detected conditions. Similarly, it may be difficult to provide indication as to normal conditions where no leakage is detected which could cause a user to question whether the system is working properly.

[0006] Accordingly, it is desirable to provide a method and graphic user interface for displaying more comprehensive and easy to understand ostomy leakage detection information.

BRIEF SUMMARY

[0007] A method and graphical user interface for displaying ostomy leakage detection information is provided according to various embodiments.

[0008] In a first aspect of the present disclosure, a method for displaying leakage information for an ostomy leakage detection system is provided. The method may include a mobile device obtaining leakage data. The leakage data may include input corresponding to the detection of leakage on at least one sensing ring of a sensing accessory. The mobile device may also determine a leakage summary notification for display based on the leakage data. The leakage summary notification may indicate a status of the sensing accessory. The mobile device may further display, on a touch screen display, the leakage summary notification.

[0009] In an embodiment, the mobile device may obtain moisture data. The moisture data may include input corresponding to the detection of moisture on at least one sensing ring of the sensing accessory. The moisture data may include no moisture detected information. The leakage data may include no leakage detected information. The leakage summary notification may include a message reporting that no moisture is detected.

[0010] In an embodiment, the mobile device may obtain moisture data. The moisture data may include input corresponding to the detection of moisture on at least one sensing ring of the sensing accessory. The moisture data may include moisture detected information that indicates moisture has been detected on all of the at least one sensing ring. The mobile device may also determine that the moisture detected information corresponds to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory. The leakage summary notification may include the recommendation to change the sensing accessory.

[0011] In an embodiment, the mobile device may determine leakage detected information corresponding to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory. The leakage data may include the leakage detected information that indicates that leakage has been detected on at least one sensing ring. The mobile device may also determine that the leakage summary notification may include the recommendation to change the sensing accessory.

[0012] In an embodiment, the at least one sensing ring may include at least three sensing rings.

[0013] In an embodiment, the mobile device may obtain moisture data. The moisture data may include input corresponding to the detection of moisture on at least one sensing ring of the sensing accessory. The moisture data may include moisture detected information that indicates moisture has been detected on at least one of the at least one sensing ring. The mobile device may also

determine that the moisture detected information corresponds to a predetermined leakage summary notification comprising a notification indicating moisture has been detected. The leakage summary notification may include the recommendation to change the sensing accessory.

[0014] In an embodiment, the mobile device may determine leakage detected information corresponding to a predetermined leakage summary notification comprising a notification indicating an initial leakage detected. The leakage data may include the leakage detected information that indicates that leakage has been detected only on an inner ring of the at least three sensing rings. The mobile device may also determine that the leakage summary notification may include the notification indicating the initial leakage detected.

[0015] In an embodiment, the mobile device may determine the leakage data may include an initial leakage detected information that indicates that leakage has been detected initially on an inner ring of the at least three sensing rings. The leakage detected information may correspond to a predetermined leakage summary notification comprising a notification indicating a recommendation to check the sensing accessory for leakage. The leakage data may include a leakage detected information that indicates that leakage has been detected on the inner ring and on a middle ring of the at least three sensing rings. The mobile device may also determine that the leakage summary notification may include a recommendation to check the sensing accessory for leakage.

[0016] In an embodiment, the mobile device may determine a leakage level based on the leakage data. The leakage level may indicate whether a leakage is detected and where the leakage is detected. The at least one sensing ring may include at least two sensing rings. The mobile device may further display an indication of the leakage level on the touch screen display.

[0017] In an embodiment, the mobile device may determine the leakage level based on the

leakage data and the determination may include a leakage detected on an N number of rings of the at least two sensing rings. The mobile device may also determine that the leakage level may include a level N.

[0018] In a second aspect of the present disclosure, a method for displaying leakage information for an ostomy leakage detection system is provided. The method may include a mobile device displaying, on a touch screen display, a sensing region interface element that indicates a leakage detected. The sensing region interface element may include a first ring interface element and a second ring interface element. The first ring interface element indicates a leakage is detected on an inner ring of a sensing accessory and the second ring interface element indicate a leakage is detected on an outer ring of the sensing accessory. The mobile device may also display, on the touch screen display, a leakage level. The leakage level may indicate a progression of a leakage detected. The mobile device may also display, on the touch screen display, a leakage summary notification. The leakage summary notification indicates an overall status of the sensing accessory and whether to change the sensing accessory.

[0019] In an embodiment, the mobile device may obtain moisture data. The moisture data may include input corresponding to the detection of moisture on at least one sensing ring of a sensing accessory. The mobile device may also obtain leakage data. The leakage data may include a condition whereby leakage has been detected on the at least one sensing ring of the sensing accessory. The mobile device may further determine that the condition corresponds to a predetermined leakage summary notification based on the moisture data and the leakage data. The leakage summary notification indicates an overall status of the sensing accessory and whether to change the sensing accessory. The mobile device may also display on a touch screen display, the leakage summary notification.

[0020] In an embodiment, the sensing region interface element indicates a moisture detected. The sensing region interface element may include four quadrants.

[0021] In an embodiment, the four quadrants on the sensing region interface element are displayed according to an orientation of the sensing accessory on a user's body.

[0022] In an embodiment, the method further includes obtaining orientation data, wherein the orientation data includes an input from a user indicative of the orientation of the sensing accessory on the user's body.

[0023] In an embodiment, the first ring interface element indicates a leakage is detected on a quadrant of the inner ring of the sensing accessory.

[0024] In an embodiment, the second ring interface element indicates a moisture is detected on a quadrant of the outer ring of the sensing accessory.

[0025] In an embodiment, the sensing region interface element indicates a leakage detected based on a color displayed. A first color indicates a leakage detected and a second color indicates a no leakage detected.

[0026] In a third aspect of the present disclosure, a computing device for displaying leakage information for an ostomy leakage detection system is provided. The computing device may include one or more processors, a non-transitory computer-readable memory storing instructions executable by the one or more processors. The one or more processors may be configured to obtain leakage data. The leakage data may include a leakage detected on the at least one sensing ring of a sensing accessory. The one or more processors may also determine the leakage data may include a leakage detected. The one or more processors may further determine that that a leakage summary notification may include a leakage detected message. The leakage summary notification indicates a status of the sensing accessory.

[0027] In an embodiment, the one or more processors may obtain moisture data. The moisture data may include a moisture detected on at least one sensing ring of a sensing accessory. The moisture data may include no moisture detected information and leakage data may include no leakage detected information. The leakage summary notification may include a message reporting that no moisture is detected.

[0028] In an embodiment, the one or more processors may obtain moisture data. The moisture data may include input corresponding to the detection of moisture on at least one sensing ring of the sensing accessory. The moisture data may include moisture detected information that indicates moisture has been detected on all of the at least one sensing ring. The one or more processors may also determine that the moisture detected information corresponds to a predetermined leakage summary notification may include a recommendation to change the sensing accessory. The leakage summary notification may include the recommendation to change the sensing accessory.

[0029] In an embodiment, the one or more processors may determine leakage detected information corresponds to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory. The leakage data may include the leakage detected information that indicates that leakage has been detected on at least one sensing ring. The one or more processors may also determine that the leakage summary notification may include the recommendation to change the sensing accessory.

[0030] The foregoing general description and the following detailed description are examples only and are not restrictive of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] The benefits and advantages of the present embodiments will become more readily

apparent to those of ordinary skill in the relevant art after reviewing the following detailed description and accompanying drawings, wherein:

[0032] FIG. 1 is an illustration of an ostomy system, according to an embodiment.

[0033] FIG. 2 is a front view of an ostomy system attached to a user, according to an embodiment.

[0034] FIG. 3A is a body-side elevation view of a sensor circuit, according to an embodiment.

[0035] FIG. 3B is an enlarged partial body-side elevation view of a sensor circuit, according to an embodiment.

[0036] FIG. 4A is an illustration of a graphical user interface (GUI) showing a screen presenting information associated with a Level 1 leak detected, according to another embodiment.

[0037] FIG. 4B is an illustration of the GUI of FIG. 4A presenting information associated with a Level 2 leak detected.

[0038] FIG. 4C is an illustration of the GUI of FIG. 4A presenting information associated with a Level 3 leak detected.

[0039] FIG. 5A is an illustration of a GUI showing a screen presenting information associated with a Level 1 leak detected, according to another embodiment.

[0040] FIG. 5B is an illustration of the GUI of FIG. 5A presenting information associated with a Level 2 leak detected.

[0041] FIG. 5C is an illustration of the GUI of FIG. 5A presenting information associated with a Level 3 leak detected.

[0042] FIG. 6A is an illustration of a GUI showing a screen presenting information associated with a normal level detected, according to another embodiment.

[0043] FIG. 6B is an illustration of the GUI of FIG. 6A presenting information associated with

a Level 2 leak detected.

[0044] FIG. 6C is an illustration of the GUI of FIG. 6A presenting information associated with a Level 3 leak detected.

[0045] FIG. 7A is an illustration of a GUI showing a screen presenting information associated with a normal level detected, according to another embodiment.

[0046] FIG. 7B is an illustration of the GUI of FIG. 7A presenting information associated with a Level 1 leak detected.

[0047] FIG. 7C is an illustration of the GUI of FIG. 7A presenting information associated with a Level 3 leak detected.

[0048] FIG. 8A is an illustration of a GUI showing a screen presenting information associated with a Level 1 leak detected, according to another embodiment.

[0049] FIG. 8B is an illustration of the GUI of FIG. 8A presenting information associated with a Level 2 leak detected.

[0050] FIG. 8C is an illustration of the GUI of FIG. 8A presenting information associated with a Level 3 leak detected.

[0051] FIG. 9A is an illustration of a GUI showing an Orientation Settings screen for selecting a stoma location, according to another embodiment.

[0052] FIG. 9B is an illustration of the GUI of FIG. 9A showing an Orientation Settings screen for selecting an orientation of a sensing accessory at the stoma location.

[0053] FIG. 9C is an illustration of the GUI of FIG. 9A showing an Orientation Settings screen for displaying the saved stoma location and orientation of a sensing accessory.

[0054] FIG. 9D is an illustration of a GUI showing quadrants of a sensing region interface element rotated in response to selecting an orientation of a sensing accessory, according to an

embodiment.

[0055] FIG. 10A is an illustration of a GUI showing a list tab of a history screen, according to another embodiment.

[0056] FIG. 10B is an illustration of the GUI of FIG. 10A showing a graph tab of the history screen.

[0057] FIG. 10C is an illustration of the GUI of FIG. 10A showing another graph tab of the history screen.

[0058] FIG. 11A is an illustration of a GUI showing an awake alert preferences screen, according to another embodiment.

[0059] FIG. 11B is an illustration of GUI of FIG. 10A showing a sleep time alert preferences screen.

[0060] FIG. 12 is a flow diagram illustrating a method for displaying a leakage level, according to an embodiment.

[0061] FIG. 13 is a flow diagram illustrating a method for displaying a status summary, according to another embodiment.

[0062] FIG. 14 is a schematic illustration of a computing environment, according to an embodiment.

DETAILED DESCRIPTION

[0063] While the present disclosure is susceptible of embodiment in various forms, there is shown in the drawings and will hereinafter be described presently preferred embodiments with the understanding that the present disclosure is to be considered an exemplification and is not intended to limit the disclosure to the specific embodiments illustrated. The words “a” or “an” are to be

taken to include both the singular and the plural. Conversely, any reference to plural items shall, where appropriate, include the singular. The words “first,” “second,” “third,” and the like may be used in the present disclosure to describe various information, such information should not be limited to these words. These words are only used to distinguish one category of information from another. The directional words “top,” “bottom,” “up,” “down,” “front,” “back,” and the like are used for purposes of illustration and as such, are not limiting. Depending on the context, the word “if” as used herein may be interpreted as “when” or “upon” or “in response to determining.”

[0064] The present disclosure provides a method and graphical user interface (GUI) for determining and displaying moisture and leakage information from an ostomy leakage detection system. The leakage information can include a leakage status, a leakage level, and a status summary of the ostomy leakage detection system. The ostomy leakage detection information can be displayed on a mobile device that can include a touch-sensitive display, haptic feedback, a speaker, and a digital camera. The ostomy leakage detection system can be configured to detect ostomy effluent leakage under a skin barrier and to alert a user. The ostomy leakage detection system can provide multiple benefits to the user. For example, the system can allow the user to intervene and change a skin barrier and/or ostomy pouch system before a leak progresses which can cause embarrassment and inconvenience to the user. Further, the ostomy leakage detection system can assist in maintaining a user's skin health by detecting a leakage in its early stage to prevent prolonged skin exposure to ostomy effluent, which can lead to skin health complications. The ostomy leakage detection system can also support a user's emotional well-being by reducing anxiety associated with a risk of leakage. The ostomy leakage detection system may be applied to an ostomy barrier of a one-piece pouch system or a faceplate for a two-piece pouch system.

[0065] FIG. 1 illustrates an ostomy two-piece pouch system 10. According to example

embodiments shown in FIG. 1, the ostomy system 10 can generally include a sensing accessory 12, an ostomy barrier appliance 14, an ostomy bag 16, a wearable device 18, and a mobile device 20. The sensing accessory 12 can include a sensing region 22, a tail region 24, and a connection region 26. The sensing region 22 can include an inlet opening 28 configured to surround a stoma (not shown). The tail region 24 can include a connector opening 30 configured to electrically and mechanically connect with the wearable device 18. The ostomy bag 16 may be configured to receive and contain bodily waste and can include a pouch coupling member 32 configured to engage with a barrier coupling member 15 to attach the ostomy bag 16 to the ostomy barrier appliance 14.

[0066] FIG. 2 illustrates the ostomy pouch system 10 mounted to a user. According to example embodiments shown in FIG. 2, the sensing accessory 12 can be attached to the ostomy barrier appliance 14 by aligning the sensing region 22 with the ostomy barrier appliance 14 and using an adhesive. The sensing region 22 can be mounted to a user using an adhesive with the inlet opening 28 surrounding the stoma. The ostomy bag 16 can be mounted on the ostomy barrier appliance 14 using the barrier coupling member 32. The wearable device 18 can be attached to the sensing accessory 12 using the tail region 24 and connector opening 30. The wearable device 18 can be mounted on a user using a patch or an adhesive.

[0067] According to example embodiments, the ostomy leakage detection system may comprise three subsystems – the sensing accessory 12, the wearable device 18, and a mobile application on the mobile device 20. The sensing accessory 12 may be provided as an accessory for an ostomy pouch system. The sensing accessory 12 may include sensors for detecting the presence of ostomy effluent. The sensing accessory 12 may be configured to communicate leakage detection signals to the wearable device 18.

[0068] The wearable subsystem 18 may be a wearable device configured to perform at least some processing of leakage detection signals and to alert a user of a leakage event. The wearable subsystem 18 may be configured to communicate electronically through a wired or wireless communication system with the mobile application. Such electronic communications may include raw data as acquired from the sensing accessory 12 or a leak status of the sensing accessory 12. The mobile application may be a digital subsystem installed on the mobile device 20. The mobile application may be configured to further process leak detection data and provide an alert or other information about an ostomy appliance to a user.

[0069] The mobile application can display a GUI with a leakage status, a leakage level, and a status summary for alerting a user of the ostomy leakage detection system to the presence of ostomy effluent (leakage or moisture) under the sensing accessory 12 (or hydrocolloid barrier). The status summary can include an indication description of the general state of the sensing accessory 12 and any recommendations for maintaining the sensing accessory 12. The mobile application can further display a current wear time and interactive screens for setting the orientation of the sensing accessory 12, setting alerts for leakage detected, and acquiring and displaying a history of leakage detected.

[0070] The sensing accessory 12 can acquire data related to leakage and moisture conditions detected at certain locations along the accessory including on annular rings or levels around the central opening and/or other sections thereof such as quadrants of the levels. The acquired data can be leakage data and moisture data. The wearable device 18 can determine if a leakage or moisture has been detected based on the leakage data and moisture data. The mobile application on the mobile device 20 can receive the leakage data, moisture data, leakage detected information, and moisture detected information and display a GUI for indicating the identification of a leak,

moisture, or dry state to a user. The GUI can include a leakage level and status summary that can indicate to the user critical information that the user can use to make their ostomy experience easier by providing both visual and textual information. Thus, a leakage detection system can be improved. For example, the leakage level can be “Normal” and the status summary indicator 140, 440 can display “No moisture detected.” The user can then quickly understand that their ostomy appliance is working properly. In another example, the GUI can display indications corresponding to detected leakage conditions of the ostomy appliance. According to embodiments presented herein, such conditions and corresponding indications can be tiered based on the severity of the detected leakage (e.g. a first condition representative of a minor leak, a second condition representative of a moderate leak, and a third condition representative of a critical leak). It will be understood that any number of levels or tiers may be used without departing from the scope of the subject invention, and that any number of predetermined thresholds can be used to differentiate the designated tiers without limitation. In one example, the GUI can display information indicating that the detected leakage is associated with conditions representative of a more severe leak and can display an indication of the same (e.g. “Level 3.”) The status summary indicator 140, 440 can concurrently display additional information or recommendations such as “Barrier change recommended” to enable the user to quickly understand that they should change their sensing accessory 12 without having to determine that there is a problem and what the problem entails.

[0071] FIG. 3A shows a body-side view of a sensor circuit 34. According to example embodiments shown in FIG. 3A, the sensor circuit 34 can generally include a conductive sensor 36, a conductive trace 38, and a connection point 40. The sensor circuit 34 can span the sensing region 22, the tail region 24, and the connection region 26. The conductive sensor 36 can be configured to detect a leak around a stoma. The conductive trace 38 can be located on the tail

region 24 and may be configured to connect the conductive sensor 36 to the connection point 40. The connection point 40 can be located on the connection region 26 and may be configured to connect to a connection pad on the wearable device 18. The sensing region 22 can be broken into four quadrants (e.g. Q1, Q2, Q3, and Q4). In some embodiments, the tail region 24 may be oriented down or south and for simplicity the four quadrants may be called NE, SE, NW, and SW. However, the directional words “NW”, “SE”, “NW”, “SW”, and the like are used for purposes of illustration and as such, are not limiting. In some other embodiments, the orientation of the tail region may be in another direction and as such the quadrants Q1, Q2, Q3, and Q4 can be used.

[0072] According to example embodiments, the conductive sensor 36 can include multiple pairs of conductive traces that can be arranged in radial sensing levels (or rings) with levels broken into the four quadrants (e.g. Q1, Q2, Q3, and Q4) of sensor pairs for detecting the direction of fluid and moisture progression. The radial sensing levels can include a first radial sensing level (or first ring) located nearest the inlet opening 28, a second outermost radial sensing level (or second ring) located near the outer edge of the sensing region 22, and one or more radial sensing levels (or rings) located between the first and second radial sensing levels. The conductive traces can be adjacent to ground traces so that resistance may be measured between the two for detecting fluid and moisture. In another embodiment, the conductive traces can detect fluid and moisture based on resistance, resonance frequency, or the like.

[0073] The conductive sensor 36 may be arranged in a predetermined pattern in the sensor region 22. For example, the sensor circuit 34 may be generally arranged in a circular or semi-circular pattern. Other suitable patterns can be provided, such as an oval or oblong pattern, or other closed or substantially closed loop patterns without limitation. The sensor circuit 34 in the sensor region 22 may be arranged at one or more radial distances from the inlet opening 28. For example,

the sensor circuit 34 may include a plurality of electrically conductive traces arranged at a plurality of different radial distances from the inlet opening 28. The sensor circuit 34 may include conductive traces and conductive pads or points that may be formed by printing on a circuit substrate using a conductive ink via a conventional printing process, for example, screen printing.

[0074] FIG. 3B shows a body-side view of a sensor circuit 34'. According to example embodiments shown schematically in FIG. 3B, the sensor circuit 34' can include a conductive sensor 36'. The conductive sensor 36' can include a first radial sensing level 44 (or first ring) located near the inlet opening 28, a second radial sensing level 46 (or second ring) located between the first radial sensing level 44 and a third radial sensing level 48, and the third radial sensing level 48 (or third ring) located near the outer edge of the sensing region 22.

[0075] FIGS. 4A-11B show a GUI 110, 210, 310, 410, 510, 610, 710, 810. According to example embodiments shown in FIG. 4A-11B, the GUI 110, 210, 310, 410, 510, 610, 710, 810 can be displayed on display 100. The display 100 can include a touch-sensitive surface for interacting with the GUI 110, 210, 310, 410, 510, 610, 710, 810. The GUI 110, 210, 310, 410, 510, 610, 710, 810 can display a plurality of screens or pages including, for example, a Home Screen, Orientation Settings Screen, History Screen, Alerts Settings Screen, and other Screens for interacting with the ostomy leakage detection system. In various embodiments, the display 100 is part of a mobile device (e.g. mobile device 20) used by a user.

[0076] **Home Screen**

[0077] The mobile application can include a Home Screen that can display leakage information about an ostomy leakage detection system. FIGS. 4A-8C show GUI 110, 210, 310, 410, 510 displaying a Home Screen. As used herein, the reference to a Home Screen is for general exemplification in accordance with embodiments presented herein and is intended to refer to a

screen that is the default or primary GUI that can be displayed or readily accessed upon the booting of the software application to present data of the type disclosed by the subject application. From the subject description, persons of ordinary skill in the art will recognize that embodiments presented by the subject application can readily display information or indications of the type disclosed herein in association with GUIs that are not formally designated or otherwise categorized as a home screen, and/or identify GUIs with other feature(s) or presentations as being the home screen. Such embodiments are within the scope of the disclosed invention without limitation.

[0078] According to example embodiments shown in FIGS. 4A-8C, the Home Screen can display a plurality of detection states: (e.g. Normal, Leakage, or Moisture). Upon determining a normal operating condition, the GUI 110, 210, 310, 410, 510 610, 710 can indicate that no significant moisture has been detected. The normal state can be represented by gray or other light colors. Upon detecting and determining a leak, the GUI 110, 210, 310, 410, 510 610, 710 can display information associated with a leakage state. Such information can indicate that significant moisture has been detected by the system and can display other indicia that can visualize the location and severity of the leakage relative a rendering corresponding to the sensing accessory 12. The leakage state can be represented by colors that are different from those associated with the normal state, such as a dark gray (or orange) color. The moisture state can indicate that significant moisture has been detected, but it does not meet certain predetermined or pre-programmed criteria associated with leakage. The moisture state can be represented by dots or other visual elements. The GUI 110, 210, 310, 410, 510 610, 710 can be updated as leakage progresses until the sensing accessory 12 is changed. These updates may be accompanied by alerts, based on user-established settings.

[0079] According to example embodiments shown in FIGS. 4A-8C, the GUI 110, 210, 310,

410, 510 can include a sensing region interface element 122, 222, 322, 422, 522. The sensing region interface element 122, 222, 322, 422, 522 can include a first ring interface element 144, 244, 344, 444, 544 a second ring interface element 146, 246, 346, 446, 546 and a third ring interface element 148, 248, 348, 448, 548. The first ring interface element 144, 244, 344, 444, 544 can display a status of, and detected conditions associated with, the first radial sensing level 44, and the second ring interface element 146, 246, 346, 446, 546 can display a status of, and detected conditions associated with, the second radial sensing level 46, and the third ring interface element 148, 248, 348, 448, 548 can display a status of, and detected conditions associated with, the third radial sensing levels 48. The sensing region interface element 122, 222, 322, 422, 522 can display an indication for a leakage and/or moisture detected alert on four quadrants NW, NE, SW, SE (i.e. Q1, Q2, Q3, Q4) of the sensing region interface element 122, 222, 322, 422, 522 in response to a leakage and/or moisture detected on the corresponding quadrant of the sensing region 22 of the sensing accessory 12.

[0080] The sectional detection of a leakage and/or moisture can be related to the orientation of the sensing accessory 12 on the user's body. The sensing region 22 of the sensing accessory 12 can be broken into multiple sections or quadrants (e.g. four quadrants Q1, Q2, Q3, Q4 or NW, NE, SW, SE). These quadrants may be fixed relative to the sensing accessory 12 and as such the quadrants will rotate based on the orientation of the sensing accessory 12. The quadrants of the sensing region 22 of the sensing accessory 12 can be displayed as quadrants on the sensing region interface element 122, 222, 322, 422, 522. In some example embodiments, the user can input the orientation of the sensing accessory 12 on the mobile device on an orientation settings screen, as discussed in regard to FIGS. 9A-9C. This process can allow the sensing region interface element 122, 222, 322, 422, 522 to have an orientation that matches the orientation of the sensing accessory

12 on the user's body.

[0081] According to example embodiments shown in FIG. 4A-8C, the GUI 110, 210, 310, 410, 510 can include a tail region interface element 124, 224, 324, 424 a screen indicator 134, a user information indicator 136, 436, a level indicator 138, 438, a status summary indicator 140, 440, and a current wear indicator 142, 442.

[0082] The screen indicator 134 can provide an indication with information to identify the GUI screen that is currently being displayed. For example, the screen indicator 134 can display a "Home" indication to display that the GUI is currently at a home screen which shows the leakage status. Other screens can include a "Settings" screen where a user can edit the system settings, a "Device" screen where the device information can be displayed, an "Alert" screen where alerts can be edited or added, an "Information" screen where information and frequently asked questions can be found, and other similar screens.

[0083] The user information indicator 136, 436 can display information about the user like the user's name and current time. For example, the user information indicator 136 can display a "GOOD MORNING ROBERT" indication to inform the user (Robert) that it is morning time and that he is logged in as Robert. An icon can also be displayed to provide an indication as to the time of day, such as a rising sun to indicate a morning time or a moon to indicate a night time.

[0084] The level indicator 138, 438 can display a detected leakage level in the form of an alpha-numeric indicator message. For example, a "NORMAL" indication (FIG. 6A) can be displayed to inform the user that no moisture is detected and a "LEVEL 1" indication (FIG. 4A) can be displayed to inform the user that an initial leak is detected. Similarly, a "LEVEL 2" (FIG. 4B) indication can be displayed to inform the user that a leak is progressing and that the user should consider checking for a leakage. In another example, a "LEVEL 3" (FIG. 4C) indication can be

displayed to inform the user that a leak in an outer ring is detected and that the user should consider changing the ostomy accessory 12. The level indicator 138, 438 can display the indication in different colors based on the level of leakage. For example, the “LEVEL 1” indication can be a light color (FIG. 5A), the “LEVEL 2” indication can be a bright color (FIG. 5B), and the “LEVEL 3” indication can be dark color (FIG. 5C). The “light”, “bright”, and “dark” colors are differentiated by shading in FIGS. 5A-5C. For example, the the “LEVEL 1” indication can be a light transparent orange color, the “LEVEL 2” indication can be a bright orange color, and the “LEVEL 3” indication can be a dark red color. In another example, the color can be a blue color or other colors that indicate a greater level of alertness for a leakage. It will be recognized by persons of ordinary skill in the art that the indication displayed by level indicator 138, 438 can include any combination of words, numbers, graphics and colors without limitation.

[0085] The status summary indicator 140, 440 can display other information corresponding to detected conditions of the sensing accessory 12 such as a summary notation of the leakage state of the sensing region 22. The status summary indicator 140, 440 can indicate to the user critical information that the user can use to make their ostomy experience easier. Thus, a leakage detection system can be improved. For example, when the sensing accessory is in a normal operating condition, the status summary indicator 140, 440 can display a message such as “No moisture detected.” The user can then quickly understand that their ostomy appliance is working properly. In another example, the status summary indicator 140, 440 can display a message such as “Barrier change recommended” and the user can quickly understand that they should change their sensing accessory 12 without having to determine that there is a problem and what the problem entails. In another example, the status summary indicator 140, 440 can display a message such as “Leak progressing, may want to change barrier.” The information provided by the status summary

indicator 140, 440 can be based on a progression of leakage and the current leakage status.

[0086] The current wear indicator 142, 442 can display an estimated time that the user has been wearing the sensing accessory 12. The mobile application can determine a current wear time that can indicate how long the user has been wearing the sensing accessory 12. The current wear time can be calculated based on determining when a new sensing accessory 12 was attached to the user.

[0087] According to example embodiments shown in FIGS. 4A-6C, the sensing region interface element 122, 222, 322 can display if a leak in the sensing region 22 has been detected by displaying a color on the ring interface elements 144, 244, 344, 146, 246, 346, 148, 248, 348. For example, a light color can indicate that no leakage has been detected and a dark color can indicate that a leakage has been detected.

[0088] According to example embodiments shown in FIGS. 4A-6C, the tail region interface element 124, 224, 324 can display the orientation of the tail region 24 on the user. The tail region interface element 124, 224, 324 can be displayed in different positions around the outer edge of the sensing region interface element 122, 222, 322 to indicate the orientation of the tail region 24 on the user based on its position. In the embodiments including a sensing region divided into quadrants, the quadrants Q1, Q2, Q3, Q4 of the sensing region interface element 122, 222, 322 may be rotated to match the orientation of the tail region interface element 124, 224, 324. In some example embodiments, the user can input the desired orientation of the sensing region interface element 122, 222, 322 on the orientation settings screen, as discussed in regard to FIGS. 9A-9C. The orientation input, from a user, may allow the tail region interface element 124, 224, 324 to match the orientation of the tail region 24 on the user's body.

[0089] FIG. 4A shows the GUI 110 displaying a home screen with a Level 1 leak detected.

According to example embodiments shown in FIG. 4A, the GUI 110 can display an initial leakage detected status. The GUI 110 can include a first moisture interface element 150 and sensing accessory settings icon 154. The first moisture interface element 150 can be displayed on the ring interface elements 144, 146, 148 to display that moisture has been detected in a particular location along the ring. The first moisture interface element 150 can be displayed in a different color as the ring interface element 144, 146, 148 to indicate a condition where only moisture has been detected (FIG. 4A) or a condition associated with the detection of both moisture on a particular quadrant and a leak (FIG. 4B). The sensing accessory settings icon 154 can access a settings screen for enabling a user to modify indication settings of the sensing accessory 12. For example, according to embodiments presented herein, the sensing accessory settings icon 154 can provide access to an interface that can display thresholds or parameters associated with the indication of moisture or leakage conditions, and the corresponding levels assigned thereto. Such an interface can further be configured to receive touch input from a user to modify such indication settings. For example, a user may elect to modify or raise the setting for providing an indication as to the presence of moisture so that the detection of low moisture content would not trigger such indication. By contrast, a user may elect to lower such setting such that indication would be generated by the detection of minimal moisture content.

[0090] According to example embodiments shown in FIG. 4A, where leakage has been detected along the first radial sensing level 44 of sensing accessory 12 and moisture has been detected along the third radial sensing level 48, the appearance of the first ring interface element 144 can change to display a dark color indicating the detection of leakage, the second and third ring interface elements 146, 148 can continue to display a light color indicating that no leakage has been detected by sensors along the second and third radial sensing levels 46, 48, and the first

moisture interface element 150 can display a dark color indicating that moisture has been detected along the third ring interface element 148. The dark color of the first moisture interface element 150 along the third ring interface element 148 can contrast with the lighter color of the third ring interface element and be visible to a user. The level indicator 138 can display a “LEVEL 1” indication and the status summary indicator 140 can display a “Moisture detected, initial leak detected” indication.

[0091] According to example embodiments shown in FIG. 4A, current wear indicator 142 can include a battery icon displaying the current battery level of the wearable device 18. In another example, the current wear indicator 142 can include a connection icon displaying a network connection strength between the wearable device 18 and the mobile device 20. It will be understood by persons of ordinary skill in the art that the current wear indicator 142 can display other symbols or indicators without limitation to provide an indication of battery level and/or network connection strength.

[0092] FIG. 4B shows the GUI 110 displaying a home screen with a Level 2 leak detected. According to example embodiments shown in FIG. 4B, where leakage has been detected along the first and second radial sensing levels 144, 146, the GUI 110 can include a second moisture point indicator element 152 that can display a moisture detected alert at one or more quadrants Q1, Q2, Q3, Q4. The GUI 110 can display an updated leakage status based on the GUI 110 in FIG. 4A. The first ring interface element 144 can display a dark color indicating the detection of leakage, the second ring interface element 146 can display dark color indicating the detection of leakage, the second moisture point indicator element 152 can display a light color indicating a moisture detected alert on the Q2 quadrant (i.e. rotated NE quadrant) of the second moisture point indicator element 152, the third ring interface element 148 can display a light color indicating that no leakage

has been detected, and the first moisture interface element 150 can display a dark color indicating a moisture detected alert on all quadrants of the third ring interface element 148. The level indicator 138 can display a “LEVEL 2” indication and the status summary indicator 140 can display a “moisture detected and leak progressing, consider checking for signs of leakage” indication. The status summary indicator 140 can determine the summary based on a progression of leakage from the leakage detected and displayed in FIG. 4A and the current leakage detected.

[0093] FIG. 4C shows the GUI 110 displaying a home screen with a Level 3 leak detected. According to example embodiments shown in FIG. 4C, where leakage has been detected along the first, second, and third radial sensing levels 144, 146, 148, the GUI 110 can display an updated leakage status based on the GUI 110 in FIG. 4B. The first ring interface element 144 can display a dark color indicating the detection of leakage, the second ring interface element 146 can display a dark color indicating the detection of leakage, the second moisture point indicator element 152 can display a light color indicating a moisture on the Q2 quadrant (i.e. rotated NE quadrant) of the second ring interface element 146, and the third ring interface element 148 can display a dark color indicating the detection of leakage. The level indicator 138 can display a “LEVEL 3” indication and the status summary indicator 140 can display a “Leak in outer ring, you may want to consider changing your barrier” indication. The status summary indicator 140 can determine the summary based on a progression of leakage from the leakage detected and displayed in FIGS. 4A and 4B and current leakage detected.

[0094] FIG. 5A shows the GUI 210 displaying a home screen with a Level 1 leak detected on a NW quadrant. According to example embodiments shown in FIG. 5A, the ring interface elements 244, 246, 248 can be broken into the four quadrants Q1, Q2, Q3, and Q4. FIG. 5A shows an example with the quadrants displayed as NW, NE, SW, SE with the tail region interface element

224 directed down (south) for an orientation. The GUI 210 can display an initial leakage detected status. The first ring interface element 244 can display a dark color on the NW quadrant to indicate a leakage detected on the NW quadrant of the first radial sensing level of the sensing region 22 and a light color on the other quadrants to indicate that no leakage has been detected on the NE, SW, SE quadrant of the first radial sensing level. The second and third ring interface elements 246, 248 can display a light color on all quadrants to indicate that no leakage has been detected on the quadrants NW, NE, SW, SE. The status summary indicator 140 can display a “Moisture sensed close to stoma. Potential Leak” indication. The current wear indicator 142 can display a “CURRENT WEAR Under 1HR” indication.

[0095] FIG. 5B shows the GUI 210 displaying a home screen with a Level 2 leak detected on multiple quadrants. According to example embodiments shown in FIG. 5B, the GUI 210 can display an updated leakage status based on the GUI 210 in FIG. 5A. The first ring interface element 244 can display a dark color on the NW and NE quadrants to indicate a leakage detected on the NW and NE quadrants of the first radial sensing level of the sensing region 22 and a light color on the SW and SE quadrants to indicate that no leakage has been detected on the SW, SE quadrants of the first radial sensing level. The second ring interface element 246 can display a dark color on the NW quadrant to indicate a leakage detected on the NW quadrant of the second radial sensing level of the sensing region 22 and a light color on the other quadrants to indicate that no leakage has been detected on the NE, SW, SE quadrant of the second radial sensing level. The third ring interface element 248 can display a light color on all quadrants to indicate that no leakage has been detected on the quadrants NW, NE, SW, SE of the second radial sensing level. The status summary indicator 140 can display a “Moisture level has increased. Leak progressing” indication. The status summary indicator 140 can determine the summary based on a progression of leakage from the

FIG. 5A and current leakage status.

[0096] FIG. 5C shows the GUI 210 displaying a home screen with a Level 3 leak detected on multiple quadrants. According to example embodiments shown in FIG. 5C, the GUI 210 can display an updated leakage status based on GUI 210 in FIG. 5B. The first ring interface element 244 can display a dark color on the NW, SW, and NE quadrants to indicate a leakage detected on the NW, SW, and NE quadrants of the first radial sensing level of the sensing region 22 and a light color on the SE quadrant to indicate that no leakage has been detected on the SE quadrant. The second ring interface element 246 can display a dark color on the NW and NE quadrants to indicate a leakage detected on the NW and NE quadrants of the second radial sensing level and a light color on the SW and SE quadrants to indicate that no leakage has been detected on the SW and SE quadrants of the second radial sensing level. The third ring interface element 248 can display a dark color on the NW quadrant to indicate a leakage detected on the NW quadrant of the third radial sensing level of the sensing region 22 and a light color on the other quadrants to indicate that no leakage has been detected on the NE, SW, SE quadrant of the third radial sensing level. The status summary indicator 140 can display a “Moisture level has increased, advanced leak. Barrier change recommended” indication. The status summary indicator 140 can determine the summary based on a progression of leakage in FIG. 5A and 5B and current leakage status.

[0097] FIG. 6A shows the GUI 310 displaying a home screen with a normal level detected. According to example embodiments shown in FIG. 6A, the GUI 310 can display an initial leakage detected status. The GUI 310 can include an action settings interface 158 with an “Actions” indication. The first and third ring interface elements 344, 348 can be a continuous ring and the second ring interface element 346 can be broken into the four quadrants Q1, Q2, Q3, Q4. FIG. 6A shows an example with the quadrants as NW, NE, SW, SE with the tail region interface element

324 directed down for an orientation. The first, second, and third ring interface elements 344, 346, 348 can display a light color indicating that no leakage has been detected. The level indicator 138 can display a “NORMAL” indication and the status summary indicator 140 can display a “No moisture detected” indication. The status summary indicator 140 can determine the summary based on a current leakage status. The current wear indicator 142 can display a “CURRENT WEAR ABOUT 1 DAY” indication.

[0098] FIG. 6B shows the GUI 310 displaying a home screen with a Level 2 leak detected. According to example embodiments shown in FIG. 6B, the first ring interface element 344 can display a dark color indicating the detection of leakage, the second ring interface element 346 can display a dark color on a NW quadrant and a light color on the NE, SW and SE quadrant to indicate a leakage detected on the NW quadrant, the third ring interface element 348 can display a light color indicating the detection of leakage. The level indicator 138 can display a “LEVEL 2” indication and the status summary indicator 140 can display a “moisture progressing” indication. The status summary indicator 140 can determine the summary based on a progression of leakage from the leakage detected and displayed in FIG. 6A and current leakage detected. The current wear indicator 142 can display a “CURRENT WEAR ABOUT 1.5 DAYS” indication.

[0099] FIG. 6C shows the GUI 310 displaying a home screen with a Level 3 leak detected. According to example embodiments shown in FIG. 6C, the first ring interface element 344 can display a dark color indicating the detection of leakage, the second ring interface element 346 can display a dark color on a NW quadrant and a light color on the NE, SW and SE quadrant to indicate a leakage detected on the NW quadrant, the third ring interface element 348 can display a dark color indicating the detection of leakage. The level indicator 138 can display a “LEVEL 3” indication and the status summary indicator 140 can display a “Moisture could exceed barrier”

indication. The status summary indicator 140 can determine the summary based on a progression of leakage from the FIGS. 6A and 6B and current leakage status. The current wear indicator 142 can display a “CURRENT WEAR ABOUT 2 DAYS” indication.

[00100] FIGS. 7A-8C show the GUI 410, 510. According to example embodiments shown in FIGS. 7A-8C, the GUI 410, 510 can include a wearable device interface element 418, a sensing region interface element 422, 522, a tail region interface element 424, a user information indicator 436, a level indicator 438, a status summary indicator 440, and a current wear indicator 442. The sensing region interface element 422, 522 can include a first ring interface element 444, 544, a second ring interface element 446, 546, and a third ring interface element 448, 548.

[00101] The wearable device interface element 418 can be displayed to indicate information about the wearable device 18. For example, the wearable device interface element 418 can be displayed based on the mobile application on the mobile device 20 having a data connection to the wearable device 18. For example, when there is a connection, the wearable device interface element 418 can be displayed, when there is no connection the wearable device interface element 418 will not be displayed or an indication (for example, “No Connection”) will be displayed with the wearable device interface element 418. It will be understood by persons of ordinary skill in the art that the wearable device interface element 418 can display other symbols or indicators without limitation to provide indication about the wearable device 18.

[00102] In another embodiment, the first, second, and third ring interface elements 444, 544, 446, 546, 448, 548 can be displayed based on a level of leakage detected. For example, when no leakage is detected, the first, second, and third ring interface elements 444, 544, 446, 546, 448, 548 can display a white or light color (FIG. 7A). Similarly, when an initial leakage is detected the first ring interface element 444, 544 can be displayed with a gray or darker color than the rest of

the sensing region interface element 422, 522 (FIGS. 7B and 8A). Additionally, when the leakage progresses, the first and second ring interface elements 444, 544, 446, 546 can display a dark color and a color darker than the rest of the sensing region interface element 422, 522 (FIG. 8B), respectively. Furthermore, when the leakage progresses to a point that it may become significant enough that a barrier change may be recommended, the first, second, and third ring interface elements 444, 544, 446, 546, 448, 548 can display a dark, gray, and light color (FIGS. 7C and 8C), respectively. The colors displayed may also be a dark red, light red, and transparent red. Similarly, a blue, green, or other color scheme can be used.

[00103] The level indicator 438 can display a level of leakage detected. For example, a “NORMAL” indication (FIG. 7A) can be displayed to inform the user that no moisture is detected, and a “LEVEL 1 of 3” indication (FIG. 7B) can be displayed to inform the user that a potential leak is detected. Similarly, a “LEVEL 2 of 3” (FIG. 8B) indication can be displayed to inform the user that a leak is progressing and that the user should consider checking for a leakage. In another example, a “LEVEL 3 of 3” (FIG. 7C) indication can be displayed to recommend the user that the ostomy accessory 12 should be changed.

[00104] FIG. 7A shows the GUI 410 displaying a home screen with a normal level detected. According to example embodiments shown in FIG. 7A, the GUI 410 can include a semi-ring interface element 456 and an information icon 458. The semi-ring interface element 456 can be displayed to indicate that no moisture or leakage is detected at the sensing region 22. The semi-ring interface element 456 can be a blue color or an opposite color than the color of the first, second, and third ring interface elements 444, 446, 448. The information icon 458 can be used to access information about the ostomy accessory 12 on a different screen or a pop-up window.

[00105] The GUI 410 can display a no leakage detected status. The sensing region interface

element 422 can display a single ring interface element with a white color indicating that no leakage has been detected. The level indicator 438 can display a “NORMAL” indication, the status summary indicator 440 can display a “No moisture detected” indication, and the current wear indicator 442 can display a “CURRENT WEAR Under 1 hour” indication.

[00106] FIG. 7B shows the GUI 410 displaying a home screen with a Level 1 leak detected. According to example embodiments shown in FIG. 7B, the GUI 410 can display an initial leakage detected status. The sensing region interface element 422 can display the first ring interface element 444 on a part of the sensing region interface element 422. The sensing region interface element 422 can display a gray color indicating the detection of leakage on the sensing region 22 and the first ring interface element 444 can display a dark color indicating that the leakage detected is on the first radial sensing level 44.

[00107] The level indicator 438 can display a “LEVEL 1 of 3” indication, the status summary indicator 440 can display a “Moisture sensed close to stoma. Potential leak” indication, and the current wear indicator 442 can display a “CURRENT WEAR Under 1 hour” indication.

[00108] FIG. 7C shows the GUI 410 displaying a home screen with a Level 3 leak detected. According to example embodiments shown in FIG. 7C, the GUI 410 can display an advanced leakage detected status. The sensing region interface element 222 can display the first, second, and third ring interface elements 444, 446, 448. The first ring interface element 444 can display a dark gray color indicating the detection of leakage, the second ring interface element 446 can display a gray color to indicate a leakage detected, and the third ring interface element 448 can display a light gray color to indicate a leakage detected. The first, second, and third ring interface elements 444, 446, 448 being displayed having a dark to light color that indicates that a leakage is detected, and that the leakage is significant enough that a barrier change is recommended.

[00109] The level indicator 438 can display a “LEVEL 3 of 3” indication, the status summary indicator 440 can display a “Moisture level has increased, advanced leak. Barrier change recommended” indication, and the current wear indicator 442 can display a “CURRENT WEAR under 1 hour” indication.

[00110] FIG. 8A shows the GUI 510 displaying a home screen with a Level 1 leak detected. According to example embodiments shown in FIG. 8A, the GUI 510 can display an initial leakage detected status. The first ring interface element 544 can display a bright color indicating the detection of leakage and the second and third ring interface element 546, 548 can display a light color indicating that no leakage has been detected. The level indicator 438 can display a “LEVEL 1 of 3” indication, the status summary indicator 440 can display a “Moisture sensed close to stoma. Potential leak” indication, and the current wear indicator 442 can display a “CURRENT WEAR Under 1 hour” indication.

[00111] FIG. 8B shows the GUI 510 displaying a home screen with a Level 2 leak detected. According to example embodiments shown in FIG. 8B, the GUI 510 can display a progressed leakage detected status. The first ring interface element 544 can display a dark color indicating the detection of leakage, the second ring interface element 546 can display a gray color indicating the detection of leakage, and the third ring interface element 548 can display a light color indicating that no leakage has been detected. The level indicator 438 can display a “LEVEL 2 of 3” indication, the status summary indicator 440 can display a “Moisture level has increased. Leak progressing” indication, and the current wear indicator 442 can display a “CURRENT WEAR ABOUT 12 HOURS” indication.

[00112] FIG. 8C shows the GUI 510 displaying a home screen with a Level 3 leak detected. According to example embodiments shown in FIG. 8C, the GUI 510 can display an advanced

leakage detected status. The first ring interface element 544 can display a dark color indicating the detection of leakage, the second ring interface element 546 can display a lighter dark color indicating the detection of leakage, and the third ring interface element 548 can display a gray color indicating the detection of leakage. The level indicator 438 can display a “LEVEL 3 of 3” indication, the status summary indicator 440 can display a “Moisture has increased, advance leak. Barrier change recommended” indication, and the current wear indicator 442 can display a “CURRENT WEAR ABOUT 1 DAY” indication.

[00113] Orientation Settings Screen

[00114] FIGS. 9A-9C show a GUI 810 displaying orientation settings screens. According to example embodiments shown in FIGS. 9A-9C, the GUI 810 can include a screen indicator 834, a graphical representation 862, 872, 882 of a user, instructions 866, 876, and an input button 868, 878. Referring to FIG. 9A, the screen indicator 834 can display a “Location of Stoma” indication to inform that the current screen is for selecting a location of a user’s stoma on the graphical representation 862 (also referred to herein as “grid”) of user’s body. The GUI 810 may display the graphical representation 862 of the user. The GUI may indicate the right side and left side of the graphical representation 862. The instructions 866 can provide the user with information regarding the information the user needs to provide. For example, the instructions 866 can tell the user “before specifying orientation, please tap on the grid the approximate location of your stoma.” These instructions 866 may instruct the user to provide the approximate location of the user’s stoma on the graphical representation 862. After a user selects a stoma location 864 on the graphical representation 862, the stoma location 864 may appear on the graphical representation 862. The user can then select the input button 868 labeled “Next”. Before the user selects a stoma location 864, the input button 868 can be greyed out and not selectable by the user. The selection

of the input button 868 may change the screen to the screen shown in FIG. 9B and store stoma location data. The stoma location data can include the provided input from the user regarding the stoma location.

[00115] Referring to FIG. 9B, the screen indicator 834 can display an “Orientation” indication that the current screen is for selecting the orientation of the sensing accessory 12 on the user. The GUI 810 may display a graphical representation 872 of the user. A representation 874 of the sensing accessory 12 can be shown at the stoma location 864 on the graphical representation 872. A clockface can be shown around the representation 874 of the sensing accessory 12. The instructions 876 can provide the user with information regarding the information the user needs to provide. For example, the instructions 876 may tell the user “Select on the clockface the orientation of your sensing accessory.” These instructions 876 may instruct the user to provide the orientation of the sensing accessory 12 relative to the clockface provided around the representation 874 of the sensing accessory 12. After a user inputs the orientation of the sensing accessory 12 on the clockface of the graphical representation 872, for example, by selecting a direction or location of a tail region 24 of the sensing accessory 12, the orientation of the sensing accessory 12 can change to show the tail region 24 pointing toward the selected location 880 on the clockface. The user can then select the input button 878 labeled “Save”. Before the user selects a location 880, the input button 878 can be greyed out and not selectable by the user. The selection of the input button 878 may change the screen to the screen shown in FIG. 9C and stores orientation data. The orientation data may include the provided input from the user regarding the orientation of the sensing accessory 12. If the user realizes that the stoma location 864 is incorrect, then they can press the back button 870 to go back to the screen of FIG. 9A to select a new stoma location 864.

[00116] Referring to FIG. 9C, the screen indicator 834 can display an “Orientation Saved”

indication that the current screen is for showing the saved orientation of the sensing accessory 12 at the stoma location 864. The GUI 810 may display a graphical representation 882 of the user. A representation 884 of the sensing accessory 12 can be shown on the graphical representation 882 at the stoma location 864 with the saved orientation of the sensing accessory 12. If the user realizes that the orientation of the representation 884 of the sensing accessory 12 is incorrect, then they can press the back button 870 to go back to the screen of FIG. 9B to select a new orientation. Similarly, if the user realizes that the stoma location 864 is incorrect, they can press the back button 870 to move through the previous screens to update the stoma location 864.

[00117] After the orientation data and stoma location data are stored, the GUI 110, 210, 310, 410, 510 may update the sensing region interface element 122, 222, 322, 422, 522, the quadrants Q1, Q2, Q3, Q4 (i.e. NW, NE, SW, SE), and the position of the tail region interface element 124, 224, 324, 424 based on the orientation data. FIG. 9D shows the GUI 310 (FIG. 6A-6C) with an example new orientation, where the new orientation was recorded by the GUI 810. For example, the user can set an orientation for the sensing accessory 12 on their body and the GUI 110, 210, 310, 410, 510 can update the sensing region interface element 122, 222, 322, 422, 522 and the quadrants Q1, Q2, Q3, Q4 (i.e. NW, NE, SW, SE) on the sensing region interface element 122, 222, 322, 422, 522 based on the orientation data. FIG. 9D shows GUI 310 after the user selected a 5 on the clock face of FIG. 9B. As shown in FIG. 9D, the position of the tail region interface element 324 and the sensing region interface element 322 including the quadrants Q1, Q2, Q3, Q4 were updated based on the orientation data. For example, the position of the tail region interface element 324 is located at the 5 position corresponding to the clockface of FIG. 9B, and the sensing region interface element 322 and associated quadrants Q1, Q2, Q3, Q4 rotated accordingly which can be seen in the rotation of the second ring interface element 346.

[00118] History Screen

[00119] FIGS. 10A-10C show a GUI 610 displaying a representative history screen. According to example embodiments shown in FIGS. 10A-10C, the GUI 610 can include a screen indicator 634, a list tab 674, a graph tab 676, and a photos tab 678. The screen indicator 634 can display a “History” indication indicating the current screen being displayed is a history screen. The list tab 674 can display a history list screen indicating a list of leaks detected and dates of barrier changes. The graph tab 676 can graphically display a history graph screen indicating past leaks detected through time. For example, a level 1 leak was detected on 5/12/21 at 4PM and the leak increased to a level 2 at 8PM. The photos tab 678 can display photos of leaks detected and recorded by a user.

[00120] According to example embodiments shown in FIGS. 10A-10C, the history screen can display information regarding conditions that were detected with accessories that were previously worn by the user (“past wears”) and instances of leakage. Such information can be presented in multiple formats. One format can comprise a list of each wear (FIG. 10A), which the user can scroll through. The history screen can also communicate this information graphically (FIG. 10B), showing the progression of leakage over time. The x-axis can be automatically scaled (hours, days, etc.) to account for differences in wear time. The leak and moisture data can be stored in long-term storage and can be accessed by storing it in the short term, uploading it to a cloud server, and downloading it when necessary.

[00121] FIG. 10A shows the GUI 610 displaying a list tab of the history screen. According to example embodiments shown in FIG. 10A, the GUI 610 can include a history list section 680. The history list section 680 can display the dates when the sensing accessory 12 was changed and when a leakage was detected for each sensing accessory 12.

[00122] FIG. 10B shows the GUI 610 displaying a graph tab of the history screen. According to example embodiments shown in FIG. 10B, the GUI 610 can include a history graph section 682. The history graph section 682 can display graphs of sensing accessories 12 with an x-axis plotting a time in hours and a y-axis plotting a leakage level. The history graph section 682 displaying time in hours can allow a user to see how the current sensing accessory 12 is working.

[00123] FIG. 10C shows the GUI 610 displaying a graph tab of the history screen. According to example embodiments shown in FIG. 10C the GUI 610 can include the history graph section 682. The history graph section 682 can display graphs of sensing accessories 12 with an x-axis plotting a time in days and a y-axis plotting a leakage level. The history graph section 682 displaying time in days can allow a user to see how the ostomy system is working overall.

[00124] Alerts Settings Screen

[00125] The mobile device 20 (FIG. 1) can alert a user of a leakage detected based on a leakage level. For example, when the application determines a leakage level is elevated beyond a predetermined or pre-selected threshold (e.g. 2 or higher), the mobile device may alert the user with a vibration, sound, or visual alert.

[00126] FIGS. 11A-11B shows GUI 710 for setting alert preferences of a sensing accessory 12. According to example embodiments shown in FIGS. 11A-11B, the GUI 710 can include a screen indicator 734, a time alert input 784, a time preference input 786, and a vibration settings input 788. The screen indicator 734 can display an indication (e.g. an “Alert Preferences” indicator) to indicate that the GUI 710 is displaying the alert preferences screen. The time alert input 784 can display an interface to input a time preference. The time preference input 786 can display an interface to input a level preference. The vibration settings input 788 can display an interface to input a vibration level preference.

[00127] The mobile application can allow the user to change settings for alerts throughout the system. This includes alerts provided by the wearable device. The user can select particular levels or states of moisture or leakage that should cause an alert and the format of the alert (e.g. vibration, audible). The system can provide the option of selecting different alerts at day and night.

[00128] FIG. 11A shows the GUI 710 displaying an awake alert preferences screen. According to example embodiments shown in FIG. 11A, the time alert input 784 can display an interface to input an awake time preference for an alert when a leak is detected during the awake time. For example, the user can input 6am as a wake up time and the system can use that time for establishing the start of an awake time in which alerts can be sent to the user. The time preference input 786 can display an interface to input a level preference for the awake time. In accordance with embodiments presented herein, the level preference can correspond to the severity of a leak condition on the sensing accessory. For example, the user may select a level 2 and 3 (which can correspond to a moderate leak condition) for the receipt of an alarm during awake hours (For example, 6am to 10:30pm). The vibration settings input 788 can display an interface to input a vibration level preference for the awake time. The vibration level can correspond to the intensity or strength of vibration generated by the mobile device. For example, the vibration alarm of the mobile device can be set to a medium level of intensity. Based on the selections displayed in FIG. 11A, the starting at 6:00 am, the device can generate alerts during the awake time to indicate the detection of leaks which correspond to the predetermined parameters associated with level 2 and/or 3 leaks that may require the user to check for a leak or to change the sensing accessory 12. The alerts based on the leakage level and a time preference, awake time, can indicate to the user critical information that the user can use to make their ostomy experience easier. Thus, a leakage detection system can be improved.

[00129] FIG. 11B shows the GUI 710 displaying a sleep time alert preferences screen. According to example embodiments shown in FIG. 11B, the time alert input 784 can display an interface to input a sleep time preference for an alert. For example, the user can input a 10:30 pm time for the time he goes to sleep and the system can use that time for alerting the user. The time preference input 786 can display an interface to input a level preference for the sleep time. For example, the user may select a level 3 only for an alarm during sleep hours (For example, 10:30pm to 6am). The vibration settings input 788 can display an interface to input a vibration level preference for the sleep time. For example, the vibration alarm of the mobile device can be set to a strong level. This way the user will be awoken at the night only when there is a level 3 leak that may require a change of the sensing accessory 12. The alerts based on the leakage level and a time preference, night time, can indicate to the user critical information that the user can use to make their ostomy experience easier. Thus, a leakage detection system can be improved.

[00130] FIG. 12 illustrates a method 1100 for displaying a leakage level. The method may be applied to a computing device such as a mobile device, personal computer, or server.

[00131] In step 1110, the computing device can obtain leakage data. For example, the leakage data can be an input from the wearable device 18. The leakage data can include whether a leakage is detected and the location along the wearable device (e.g. by ring and/or quadrant) the leakage is detected.

[00132] In step 1120, the computing device can determine the leakage level based on the leakage data. For example, the leakage level can be equal to the number of rings detecting a leakage. In such an example, if two rings, regardless of which rings, detect a leakage then the leakage level can be a level 2. In another example, the leakage level can be determined based on the leakage data and a predetermined condition. The predetermined condition can be part of a

predefined look up table that takes into account which rings detect a leakage and not just how many. For example, the leakage level can be determined based on Table 1. The predefined look up table can be utilized to associate a detected leakage condition along the wearable device with a predefined leakage indication to be generated by the device to indicate to the user how a leak is progressing from the inlet opening 28. For example, a leakage level 1 indication can correspond to and provide indication that a leak has been detected only on the inner ring of the sensing region 22, a leakage level 2 indication can correspond to and provide indication that the leak is detected on the inner ring and is progressing onto the middle ring, and the leakage level 3 indication can correspond to and provide indication that the leak is detected on the inner ring and has progressed onto the middle ring and the outer ring.

Leakage Detected	Leakage Level
None	NORMAL
Ring 1	LEVEL 1
Rings 1 and 2	LEVEL 2
Rings 1, 2, and 3	LEVEL 3

Table 1. Leakage level based on moisture and leak detected.

[00133] In step 1130, the computing device can display a leakage level indication on the GUI of the mobile device, including for example on the level indicator. The leakage level indication can be displayed using different shades and hues of color to indicate the level of leakage corresponding to the detected leakage condition. For example, for a normal level where no leakage has been detected, the level indication can be displayed in a light color (for example, an orange color). Where a detected leakage condition corresponds to a Level 1 indication, the leakage level indication can be displayed in a transparent color (for example, a transparent orange color). Where a level 2 leakage condition has been detected, the leakage level indication can be displayed in a

dark color (for example, a dark orange color), and where a level 3 leakage condition has been detected, the leakage level indication can be displayed in a dark color with a dark hue (for example, a dark red color).

[00134] FIG. 13 shows a method 1200 for displaying a status summary. The method may be applied to a computing device such as a mobile device, personal computer, or server.

[00135] In step 1210, the computing device can obtain moisture data. For example, the moisture data can be an input from the wearable device 18. The moisture data can include whether moisture is detected in accordance with a predetermined threshold and the location (e.g. in what ring and quadrant) the moisture is detected.

[00136] In step 1220, the computing device can obtain leakage data. For example, the leakage data can be an input from the wearable device 18. The leakage data can include whether leakage is detected in accordance with a predetermined threshold and the location (e.g. in what ring and quadrant) the leakage is detected.

[00137] In step 1230, the computing device can determine a status summary notification based on the moisture data and the leakage data. For example, the status summary notification can be determined based on the moisture data, the leakage data, and a predetermined condition. The predetermined condition can be part of a predefined look up table. For example, the status summary notification can be determined based on Table 2. The status summary notification displayed by the GUI can indicate to the user how a leak is progressing from the inlet opening 28 and recommend actions to be taken. Such status summary notification can be displayed at the status summary indicator. For example, when all three rings (e.g. radial sensing levels 44, 46, 48) detect moisture, the computing device can determine and instruct the generation of a status summary notification that can indicate to the user that moisture is detected in all three rings and that they

should consider changing the sensing accessory 12. In another example, a leak can be detected on ring 1 and 2 (e.g. radial sensing levels 44, 46) and the computing device can determine and instruct the generation of a status summary notification that can indicate to the user that a leak is progressing and that they should consider checking for signs of leakage on the sensing accessory 12. In another example, a leak can be detected on ring 1, 2, and 3 (e.g. radial sensing levels 44, 46, 48) and the computing device can determine and instruct the generation of a status summary notification that can indicate to the user that a leak is detected in the outer ring and that they should consider changing the sensing accessory 12. In another example, a leak can be detected on ring 1 and 2 (e.g. radial sensing levels 44, 46) and moisture can be detected on ring 3 (e.g. radial sensing level 48). Under such conditions, the computing device can determine and instruct the generation of a status summary notification that can indicate to the user that moisture is detected, a leak is progressing, and that they should consider checking for signs of leakage on the sensing accessory 12.

Moisture Detected	Leakage Detected	Status Summary
None	None	No moisture or leak detected
Any single ring	None	Moisture detected, but no leak
Any two rings	None	Moisture detected, but no leak
Rings 1, 2, and 3	None	Moisture in all 3 rings, you may want to consider changing your barrier
None	Ring 1	Initial leak detected
None	Rings 1 and 2	Leak progressing, consider checking for signs of leakage
None	Rings 1, 2, and 3	Leak in outer ring, you may want to consider changing your barrier
Ring 3	Ring 1	Moisture detected, initial leak detected
Ring 3	Rings 1 and 2	Moisture detected and leak progressing, consider checking for signs of leakage
Rings 2 and 3	Ring 1	Moisture detected, initial leak detected

Table 2. Leakage level based on moisture and leak detected

[00138] In step 1240, the computing device can display the status summary notification. The status summary notification can be displayed as an indication on the GUI. For example, the status summary notification can be displayed using color text/indication and animation. For example, when a recommendation to change the sensing accessory 12 is displayed, an orange text can be used to display the recommendation. In another example, an animation can be used to indicate that the sensing accessory 12 should be changed. The animation can include the sensing region interface element flashing or enlarging. The animation can also include the indication of the status summary notification dynamically enlarging.

[00139] In another embodiment, the status summary can be determined based on a time between a detected leak and moisture between two or more rings. For example, a leak can be detected on ring 1 and a short time after (for example, 5 minutes) moisture is detected on rings 2 and 3. Under such conditions, a status summary notification can be generated and displayed which can indicate

to the user that a leak is detected and that they should consider checking for signs of leakage.

[00140] In another embodiment, the status summary can be determined based on how long a leakage has been detected. For example, a leakage can be detected on ring 1 and after a significant amount of time (for example, 12 Hours) a status summary notification can be generated and displayed which can recommend to the user to change the sensing accessory 12 in order to avoid skin irritation.

[00141] In another embodiment, the status summary can be determined based on the current wear time. For example, a leak can be detected on ring 1 and the current wear time is near a threshold time where the sensing accessory 12 should be changed. Under such conditions, a status summary notification can be generated and displayed which can indicate that there is a leak and that the sensing accessory 12 should be changed.

[00142] FIG. 14 shows a computing environment 1310 that can be part of the device 20. According to example embodiments shown in FIG. 14, the computing environment 1310 can be connected to a touch-sensitive display 1350 (e.g. display 100) and a communication unit 1360. The computing environment 1310 can include a processor 1320, a memory 1330, and an I/O interface 1340.

[00143] The processor 1320 can typically control the overall operations of the computing environment 1310, such as the operations associated with data acquisition, data processing, and data communications. The processor 1320 can include one or more processors to execute instructions to perform all or some of the steps in the above-described methods. Moreover, the processor 1320 can include one or more modules that facilitate the interaction between the processor 1320 and other components. The processor may be or include a Central Processing Unit (CPU), a microprocessor, a single chip machine, a graphical processing unit (GPU), or the like.

[00144] The memory 1330 can store various types of data to support the operation of the computing environment 1310. Memory 1330 can include predetermined software 1331. Examples of such data comprise instructions for any applications or methods operated on the computing environment 1310, raw data, leak data, moisture data, resistance values, etc. The memory 1330 may be implemented by using any type of volatile or non-volatile memory devices, or a combination thereof, such as a static random-access memory (SRAM), an electrically erasable programmable read-only memory (EEPROM), an erasable programmable read-only memory (EPROM), a programmable read-only memory (PROM), a read-only memory (ROM), a magnetic memory, a flash memory, a magnetic or optical disk, or the like.

[00145] The I/O interface 1340 can provide an interface between the processor 1320 and peripheral interface modules, such as a RF circuitry, external port, proximity sensor, audio and speaker circuitry, video and camera circuitry, microphone, accelerometer, display controller, optical sensor controller, intensity sensor controller, haptic feedback controller, other input controllers, keyboard, a click wheel, buttons, and the like. The buttons may include but are not limited to, a home button, a power button, and volume buttons.

[00146] Touch-sensitive display system 1350 can include LCD (liquid crystal display), LPD (light emitting polymer display), LED (light emitting diode), organic light-emitting diode (OLED) or other similar display technologies. Touch-sensitive display system 1350 can include a display controller that can detect any contact or movement thereof using any of a plurality of touch sensing technologies, including but not limited to capacitive, resistive, infrared, surface acoustic wave technologies, proximity sensor arrays or other similar technologies.

[00147] Communication Unit 1360 provides communication between the processing unit, an external device, and a webserver (or cloud). The communication can be done through, for example,

WIFI, BLUETOOTH, or RF hardware and protocols. The Communication Unit 1360 can be within the computing environment or connected to it.

[00148] In some embodiments, there is also provided a non-transitory computer-readable storage medium comprising a plurality of programs, such as comprised in the memory 1330, executable by the processor 1320 in the computing environment 1310, for performing the above-described methods (e.g. methods 1100, 1200). For example, the non-transitory computer-readable storage medium may be a ROM, a RAM, or the like.

[00149] The non-transitory computer-readable storage medium has stored therein a plurality of programs for execution by a computing device having one or more processors, where the plurality of programs when executed by the one or more processors, cause the computing device to perform the above-described method (e.g. methods 1100, 1200).

[00150] In some embodiments, the computing environment 1310 may be implemented with one or more application-specific integrated circuits (ASICs), digital signal processors (DSPs), digital signal processing devices (DSPDs), programmable logic devices (PLDs), field-programmable gate arrays (FPGAs), graphical processing units (GPUs), controllers, micro-controllers, microprocessors, or other electronic components, for performing the above methods.

[00151] From the foregoing it will be observed that numerous modifications and variations can be effectuated without departing from the true spirit and scope of the novel concepts of the present disclosure. It is to be understood that no limitation with respect to the specific embodiments illustrated is intended or should be inferred. The disclosure is intended to cover by the appended claims all such modifications as fall within the scope of the claims.

CLAIMS

What is claimed is:

1. A method for displaying leakage information for an ostomy leakage detection system comprising:

obtaining leakage data, wherein the leakage data comprises input corresponding to a detection of leakage on at least one sensing ring of a sensing accessory;

determining a leakage summary notification for display based on the leakage data, wherein the leakage summary notification indicates a status of the sensing accessory; and

displaying, on a touch screen display, the leakage summary notification.

2. The method of claim 1, wherein determining the leakage summary notification based on the leakage data comprises:

obtaining moisture data, wherein the moisture data comprises input corresponding to a detection of moisture on at least one sensing ring of the sensing accessory,

wherein the moisture data comprises no moisture detected information,

wherein the leakage data comprises no leakage detected information, and

wherein the leakage summary notification comprises a message reporting that no moisture is detected.

3. The method of claim 1, wherein determining the leakage summary notification based on the leakage data comprises:

obtaining moisture data, wherein the moisture data comprises input corresponding to a

detection of moisture on at least one sensing ring of the sensing accessory, wherein the moisture data comprises moisture detected information that indicates moisture has been detected on all of the at least one sensing ring; and

determining that the moisture detected information corresponds to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory, wherein the leakage summary notification comprises the recommendation to change the sensing accessory.

4. The method of claim 1, wherein determining the leakage summary notification for display based on the leakage data comprises:

determining leakage detected information corresponding to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory, wherein the leakage data comprises the leakage detected information that indicates that leakage has been detected on at least one sensing ring; and

determining the leakage summary notification comprises the recommendation to change the sensing accessory.

5. The method of claim 1, wherein the at least one sensing ring comprises at least three sensing rings.

6. The method of claim 5, wherein determining the leakage summary notification for display based on the leakage data comprises:

obtaining moisture data, wherein the moisture data comprises input corresponding to a

detection of moisture on at least one sensing ring of the sensing accessory, wherein the moisture data comprises moisture detected information that indicates moisture has been detected on at least one of the at least three sensing rings; and

determining that the moisture detected information corresponds to a predetermined leakage summary notification comprising a notification indicating moisture has been detected, wherein the leakage summary notification comprises a recommendation to change the sensing accessory.

7. The method of claim 5, wherein determining the leakage summary notification for display based on the leakage data comprises:

determining leakage detected information corresponds to a predetermined leakage summary notification comprising a notification indicating an initial leakage detected, wherein the leakage data comprises the leakage detected information that indicates that leakage has been detected only on an inner ring of the at least three sensing rings; and

determining that the leakage summary notification comprises the notification indicating the initial leakage detected.

8. The method of claim 5, wherein determining the leakage summary notification for display based on the leakage data comprises:

determining the leakage data comprises an initial leakage detected information that indicates that leakage has been detected initially on an inner ring of the at least three sensing rings;

determining leakage detected information corresponds to a predetermined leakage summary notification comprising a notification indicating a recommendation to check the

sensing accessory for leakage, wherein the leakage data comprises a leakage detected information that indicates that leakage has been detected on the inner ring and on a middle ring of the at least three sensing rings; and

determining that the leakage summary notification comprises a recommendation to check the sensing accessory for leakage.

9. The method of any one of claims 1-4, further comprising:

determining a leakage level based on the leakage data, wherein the leakage level indicates whether a leakage is detected and where the leakage is detected, wherein the at least one sensing ring comprises at least two sensing rings; and

displaying an indication of the leakage level on the touch screen display.

10. The method of claim 9, wherein determining the leakage level based on the leakage data comprises:

determining the leakage data comprises a leakage detected on an N number of rings of the at least two sensing rings; and

determining that the leakage level comprises a level N.

11. A method for displaying leakage information for an ostomy leakage detection system comprising:

displaying, on a touch screen display, a sensing region interface element that indicates a leakage detected, wherein the sensing region interface element comprises a first ring interface element and a second ring interface element, and wherein the first ring interface element indicates

a leakage is detected on an inner ring of a sensing accessory and the second ring interface element indicate a leakage is detected on an outer ring of the sensing accessory;

displaying, on the touch screen display, a leakage level, wherein the leakage level indicates a progression of a leakage detected; and

displaying, on the touch screen display, a leakage summary notification, wherein the leakage summary notification indicates an overall status of the sensing accessory and whether to change the sensing accessory.

12. The method of claim 11, wherein displaying the leakage summary notification comprises:

obtaining moisture data, wherein the moisture data comprises input corresponding to a detection of moisture on at least one sensing ring of a sensing accessory;

obtaining leakage data, wherein the leakage data comprises a condition where leakage has been detected on the at least one sensing ring of the sensing accessory;

determining the condition corresponds to a predetermined leakage summary notification based on the moisture data and the leakage data, wherein the leakage summary notification indicates an overall status of the sensing accessory and whether to change the sensing accessory; and

displaying, on a touch screen display, the leakage summary notification.

13. The method of claims 11 or 12, wherein the sensing region interface element indicates a moisture detected, and wherein the sensing region interface element comprises four quadrants.

14. The method of claim 13, wherein the four quadrants on the sensing region interface element are displayed according to an orientation of the sensing accessory on a user's body.

15. The method of claim 14, further comprising obtaining orientation data, wherein the orientation data comprises an input from a user indicative of the orientation of the sensing accessory on the user's body.

16. The method of any one of claims 13-15, wherein the first ring interface element indicates a leakage is detected on a quadrant of the inner ring of the sensing accessory.

17. The method of any one of claims 13-16, wherein the second ring interface element indicates a moisture is detected on a quadrant of the outer ring of the sensing accessory.

18. The method of any one of claims 11-17, wherein the sensing region interface element indicates a leakage detected based on a color displayed, wherein a first color indicates a leakage detected and a second color indicates a no leakage detected.

19. A computing device comprising:
one or more processors;
a non-transitory computer-readable storage medium storing instructions executable by the one or more processors, wherein the one or more processors are configured to:

 obtain leakage data, wherein the leakage data comprises a leakage detected on the
at least one sensing ring of a sensing accessory;

determine the leakage data comprises a leakage detected; and

determine a leakage summary notification based on the leakage data, wherein the leakage summary notification comprises a leakage detected message, and wherein the leakage summary notification indicates a status of the sensing accessory.

20. The computing device of claim 19, wherein the one or more processors configured to determine the leakage summary notification based on the leakage data are further configured to:

obtain moisture data, wherein the moisture data comprises a moisture detected on at least one sensing ring of a sensing accessory,

wherein the moisture data comprises no moisture detected information;

wherein the leakage data comprises no leakage detected information, and

wherein the leakage summary notification comprises a message reporting that no moisture is detected.

21. The computing device of claim 19, wherein the one or more processors configured to determine the leakage summary notification based on the leakage data are further configured to:

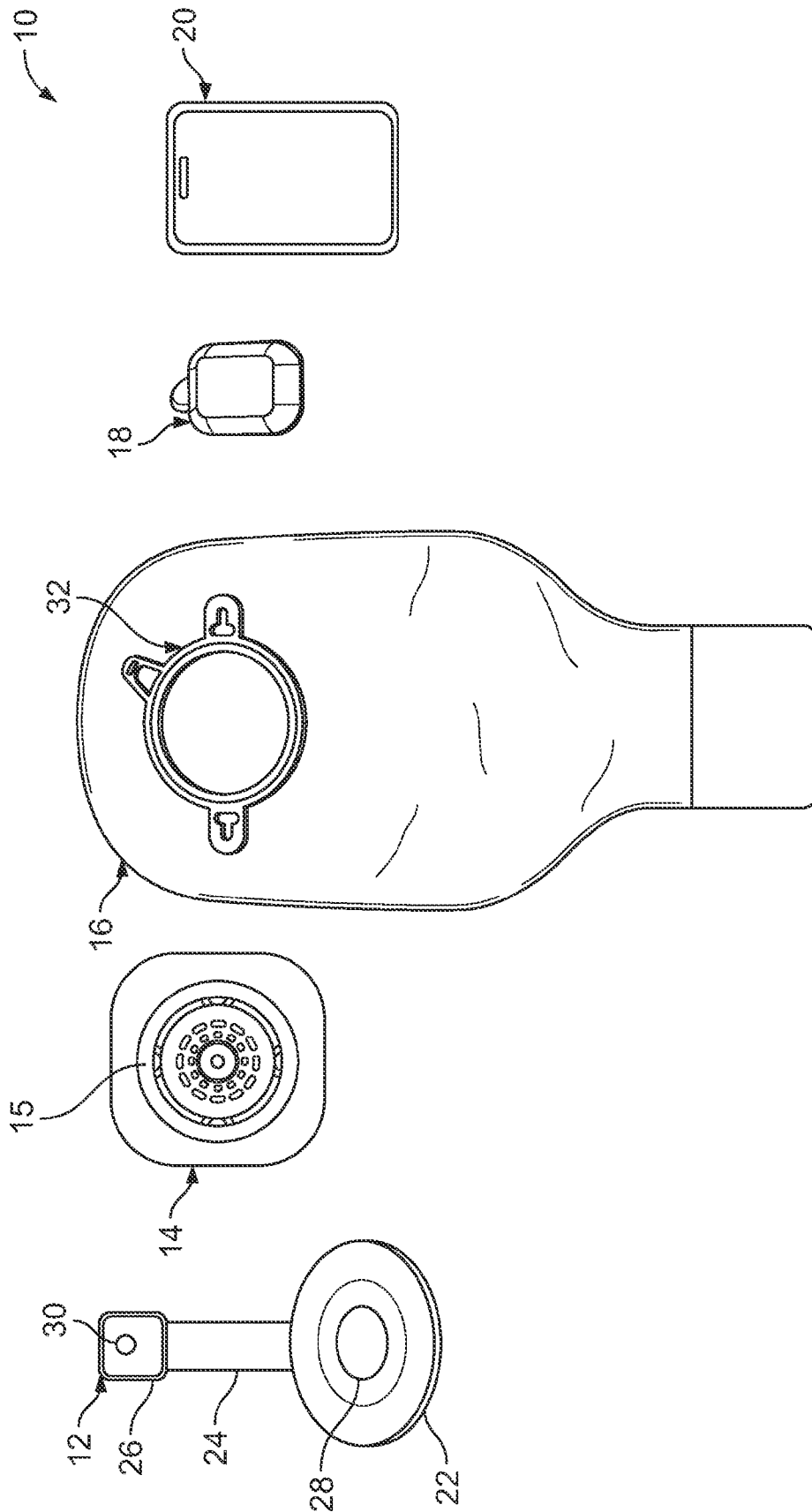
obtain moisture data, wherein the moisture data comprises input corresponding to a detection of moisture on at least one sensing ring of the sensing accessory, wherein the moisture data comprises moisture detected information that indicates moisture has been detected on all of the at least one sensing ring; and

determine that the moisture detected information corresponds to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory, wherein the leakage summary notification comprises the recommendation to change the sensing accessory.

22. The computing device of claim 19, wherein the one or more processors configured to determine the leakage summary notification based on the leakage data are further configured to:

determine leakage detected information corresponds to a predetermined leakage summary notification comprising a recommendation to change the sensing accessory, wherein the leakage data comprises the leakage detected information that indicates that leakage has been detected on at least one sensing ring; and

determine that the leakage summary notification comprises the recommendation to change the sensing accessory.





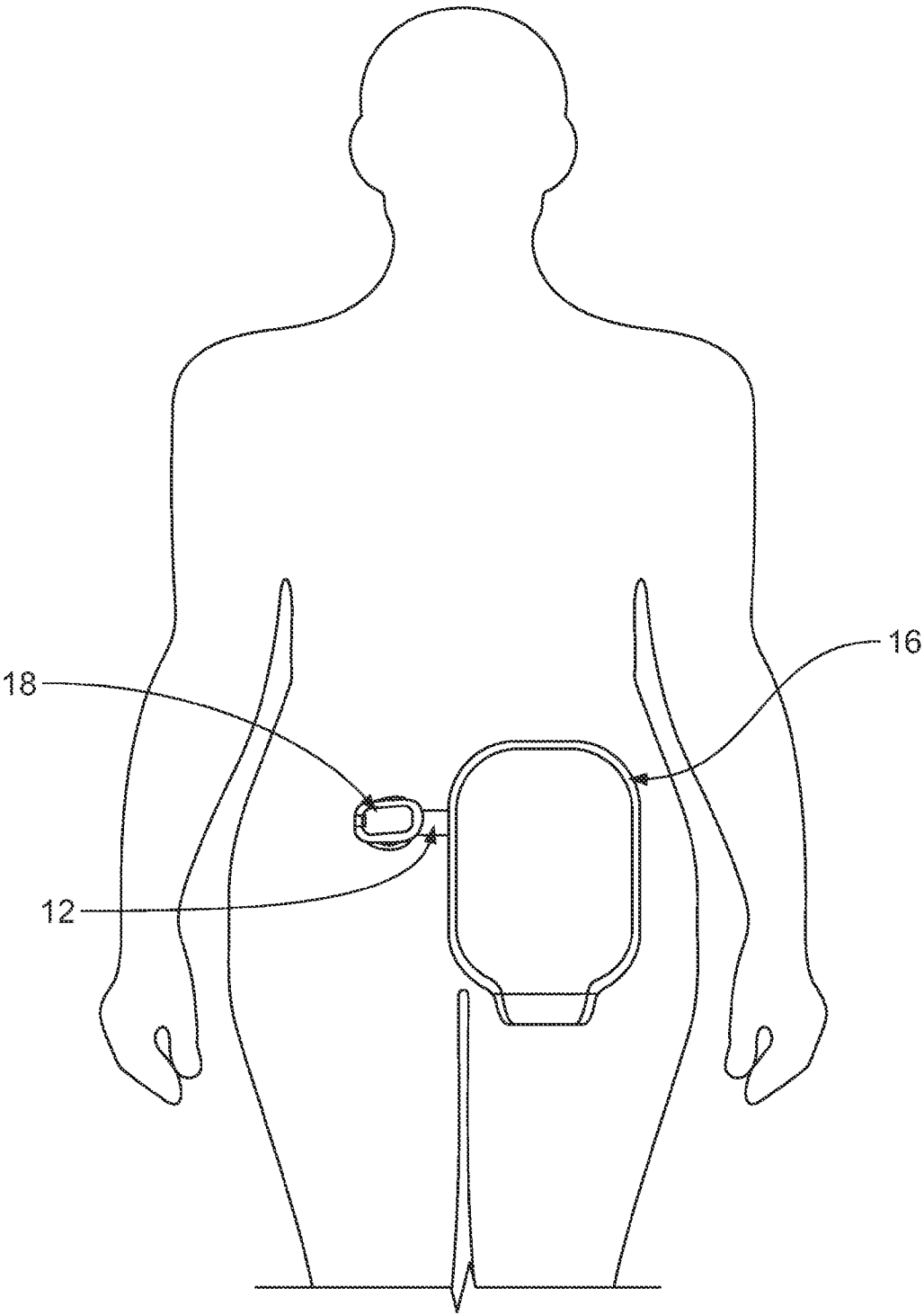


FIG. 2

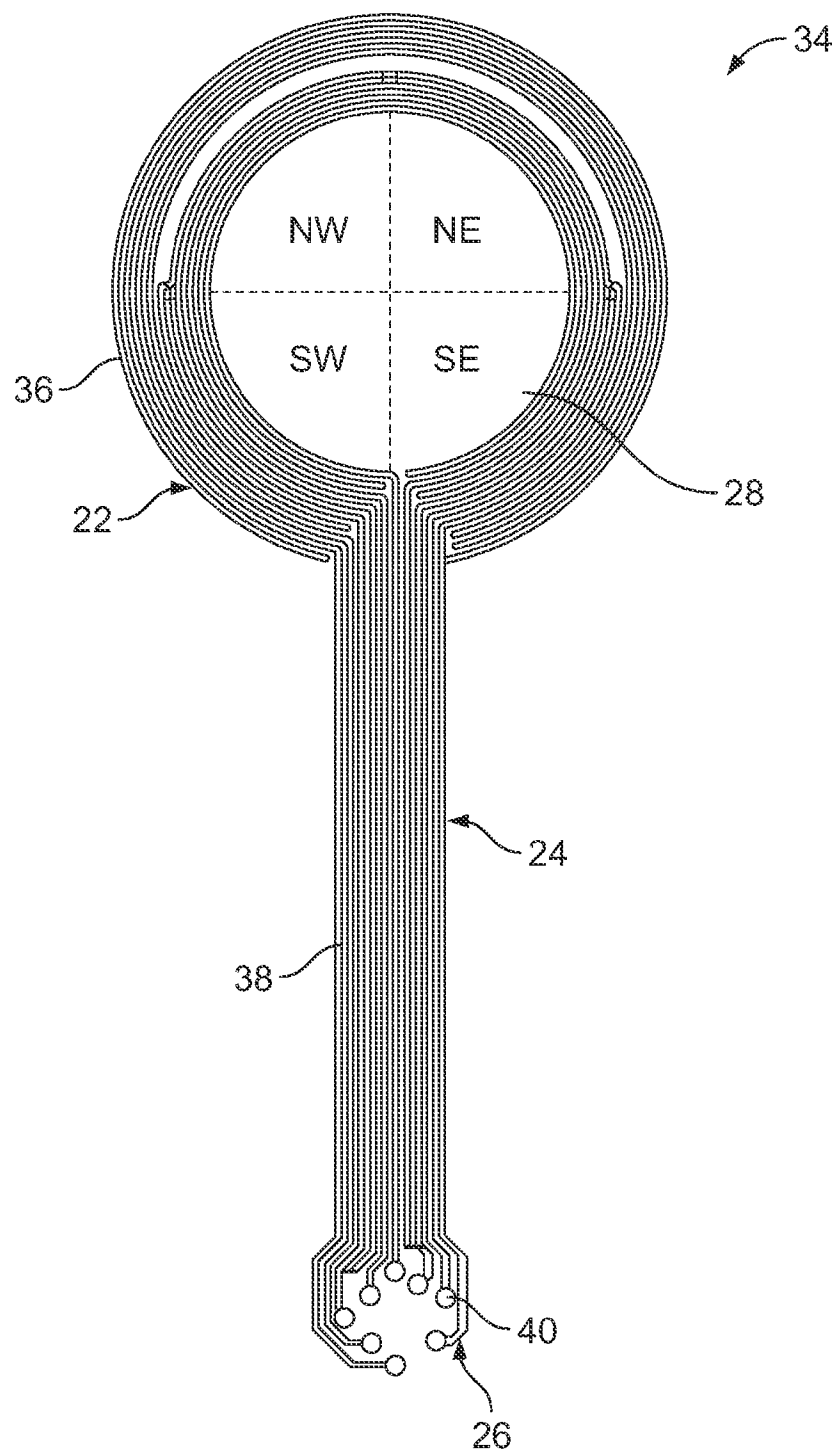


FIG. 3A

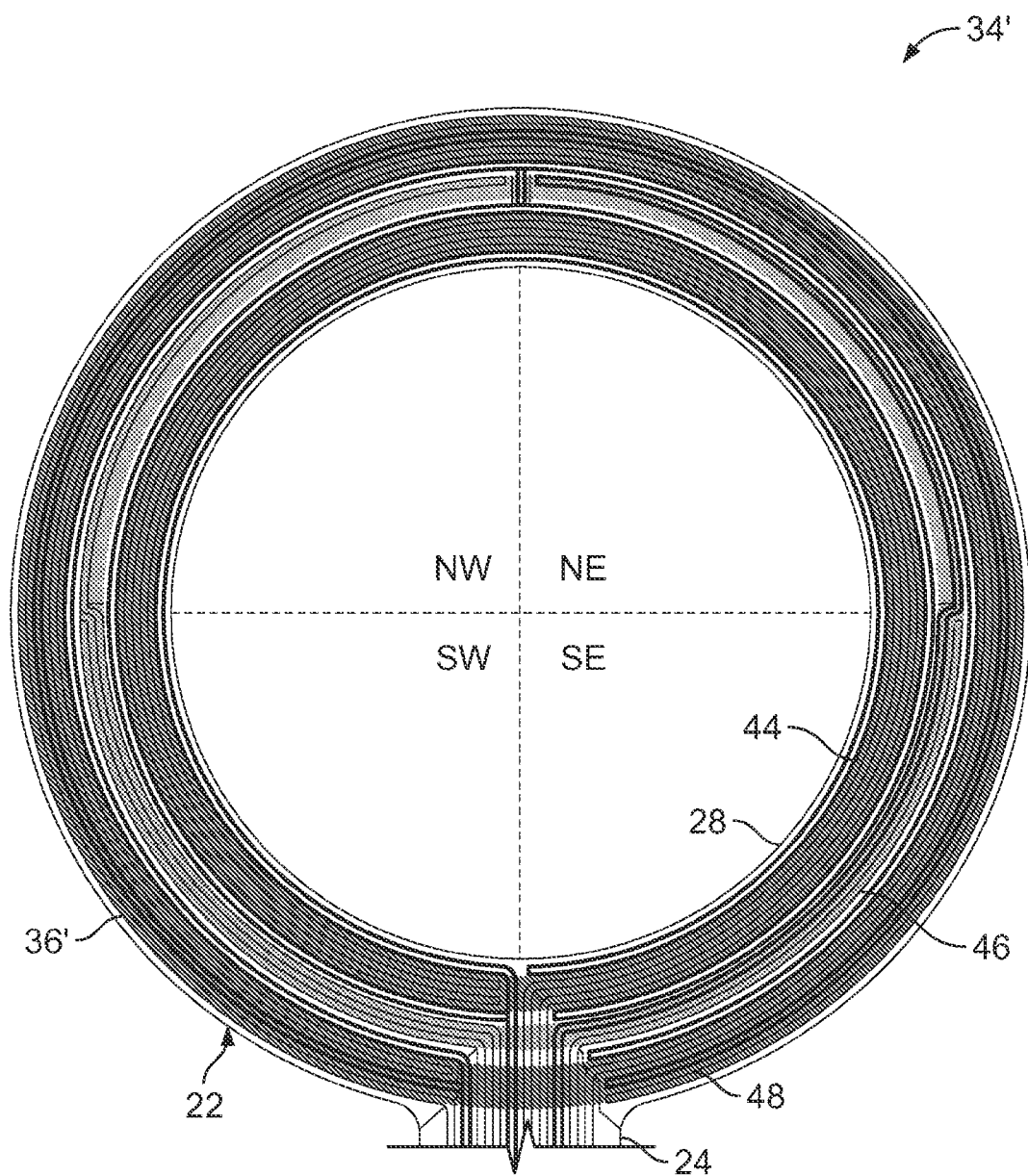


FIG. 3B

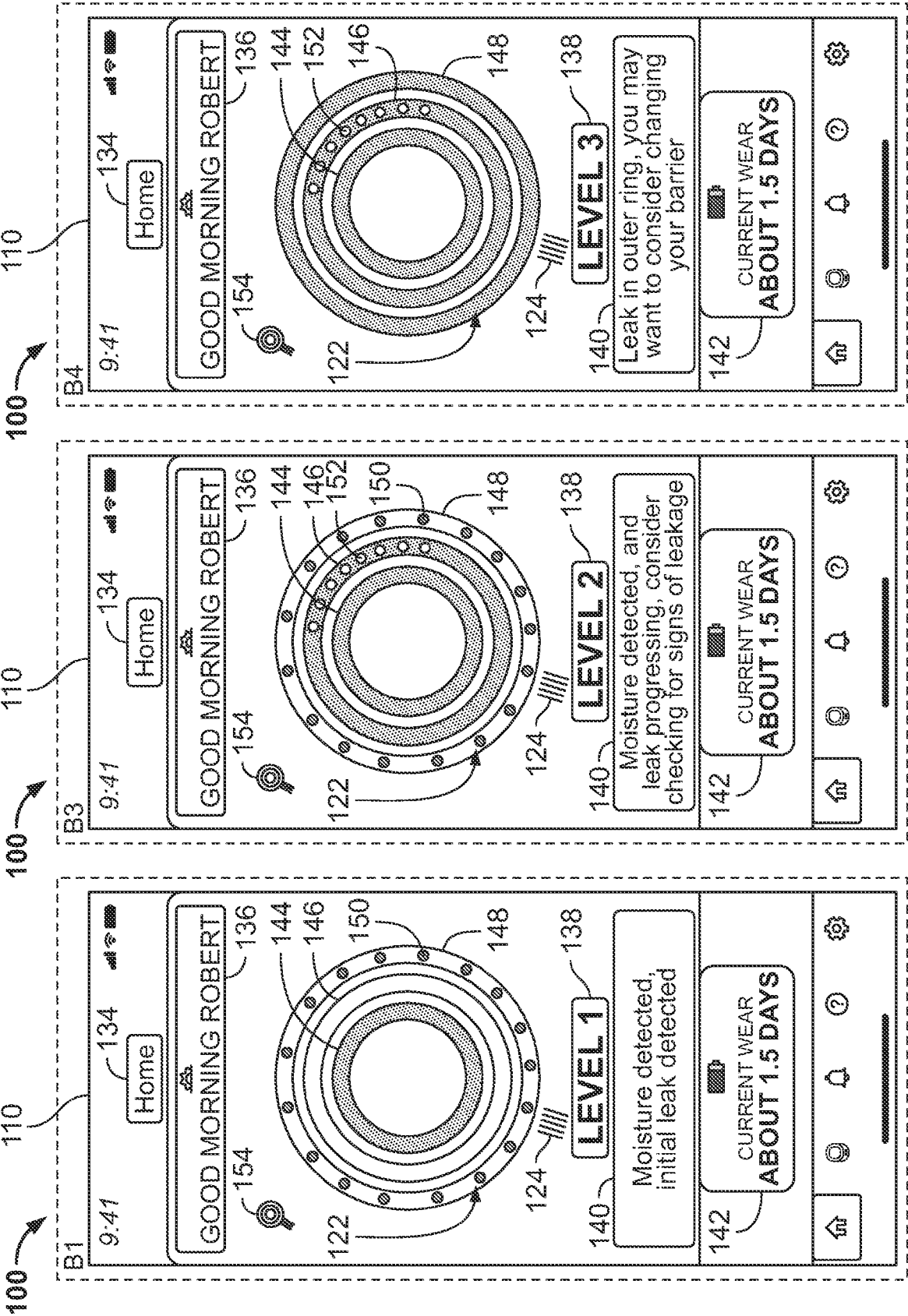


FIG. 4C

FIG. 4B

FIG. 4A

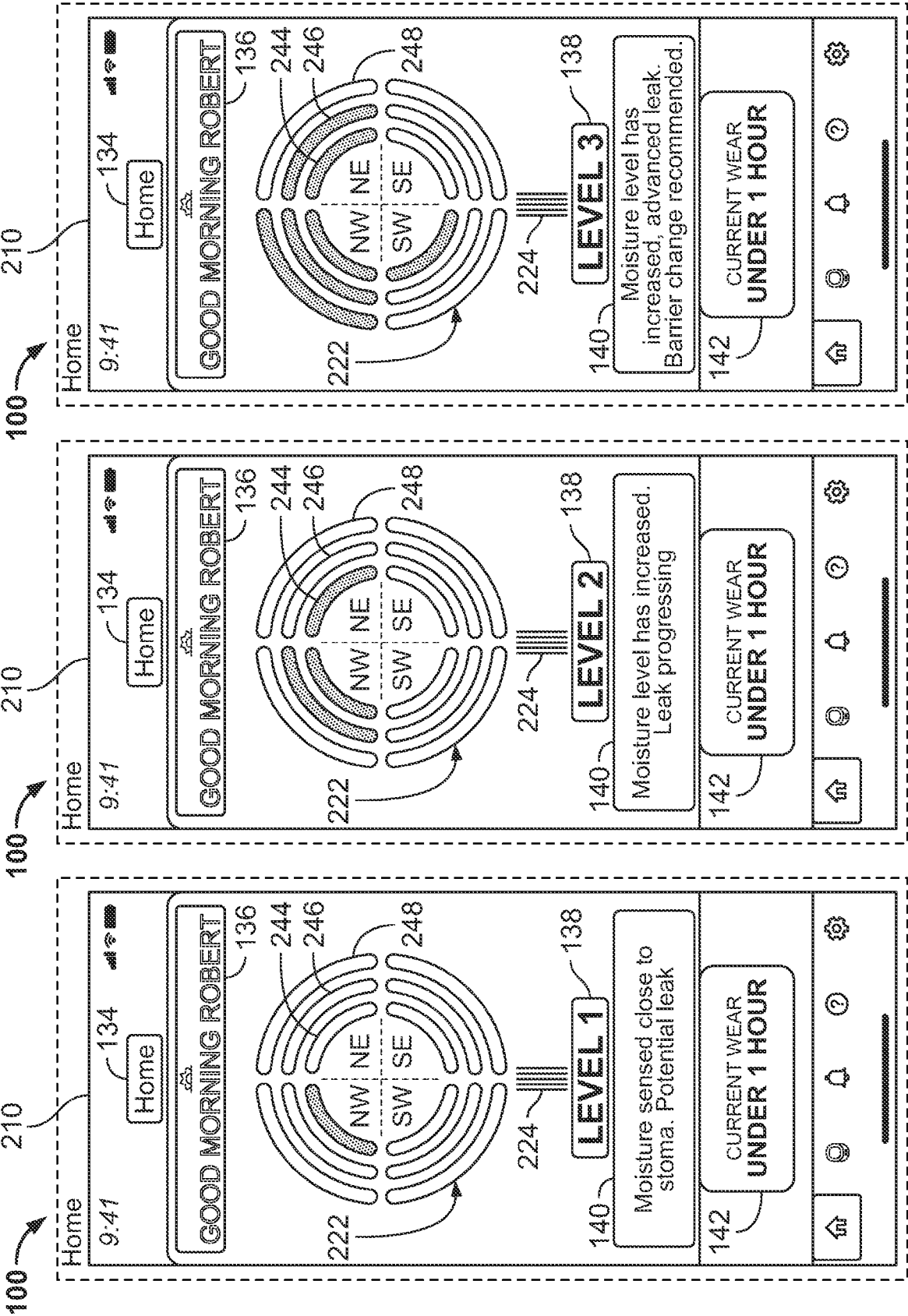


FIG. 5C

FIG. 5B

FIG. 5A

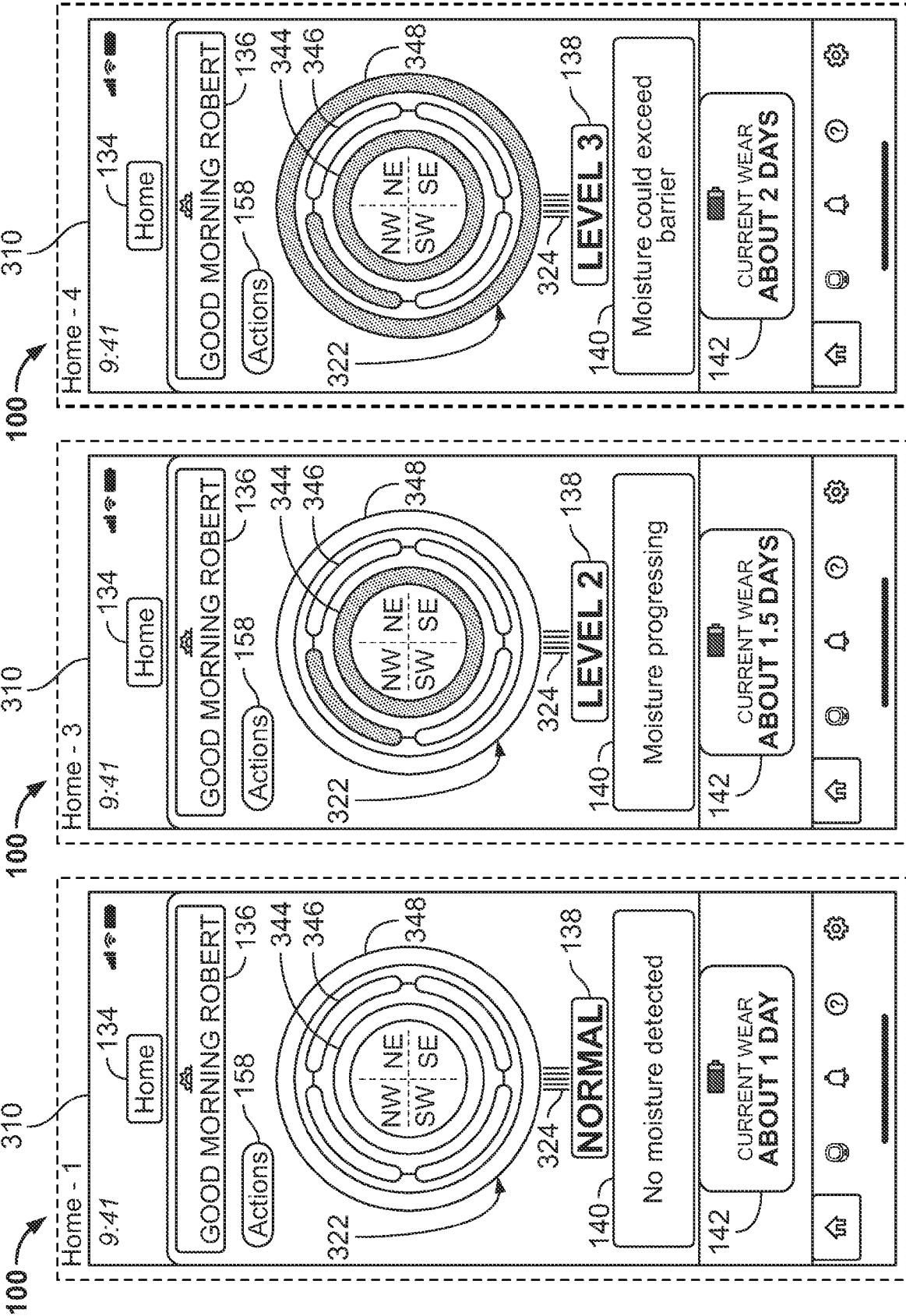


FIG. 6C

FIG. 6B

FIG. 6A

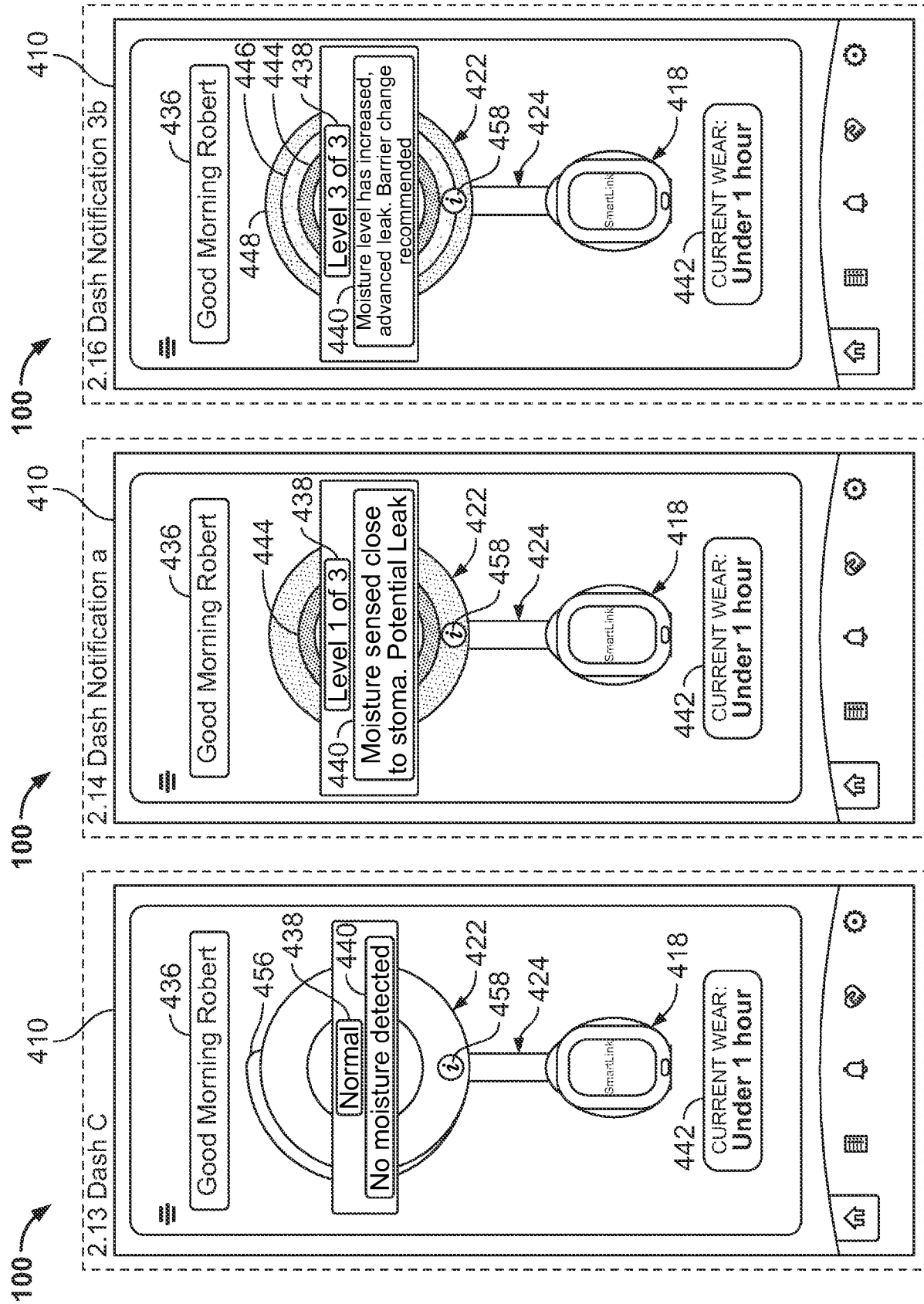


FIG. 7A

FIG. 7B

FIG. 7C

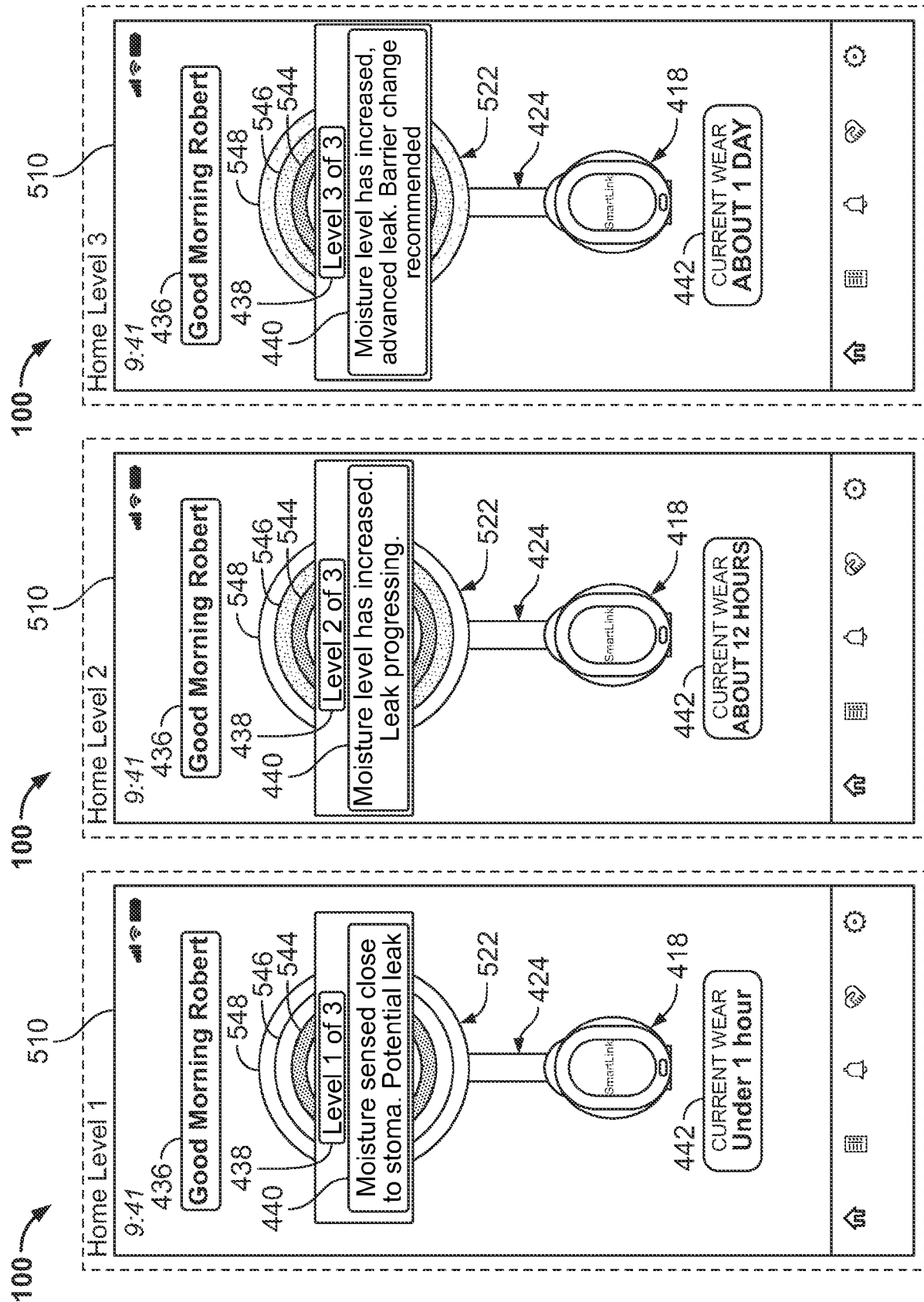


FIG. 8C

FIG. 8B

FIG. 8A

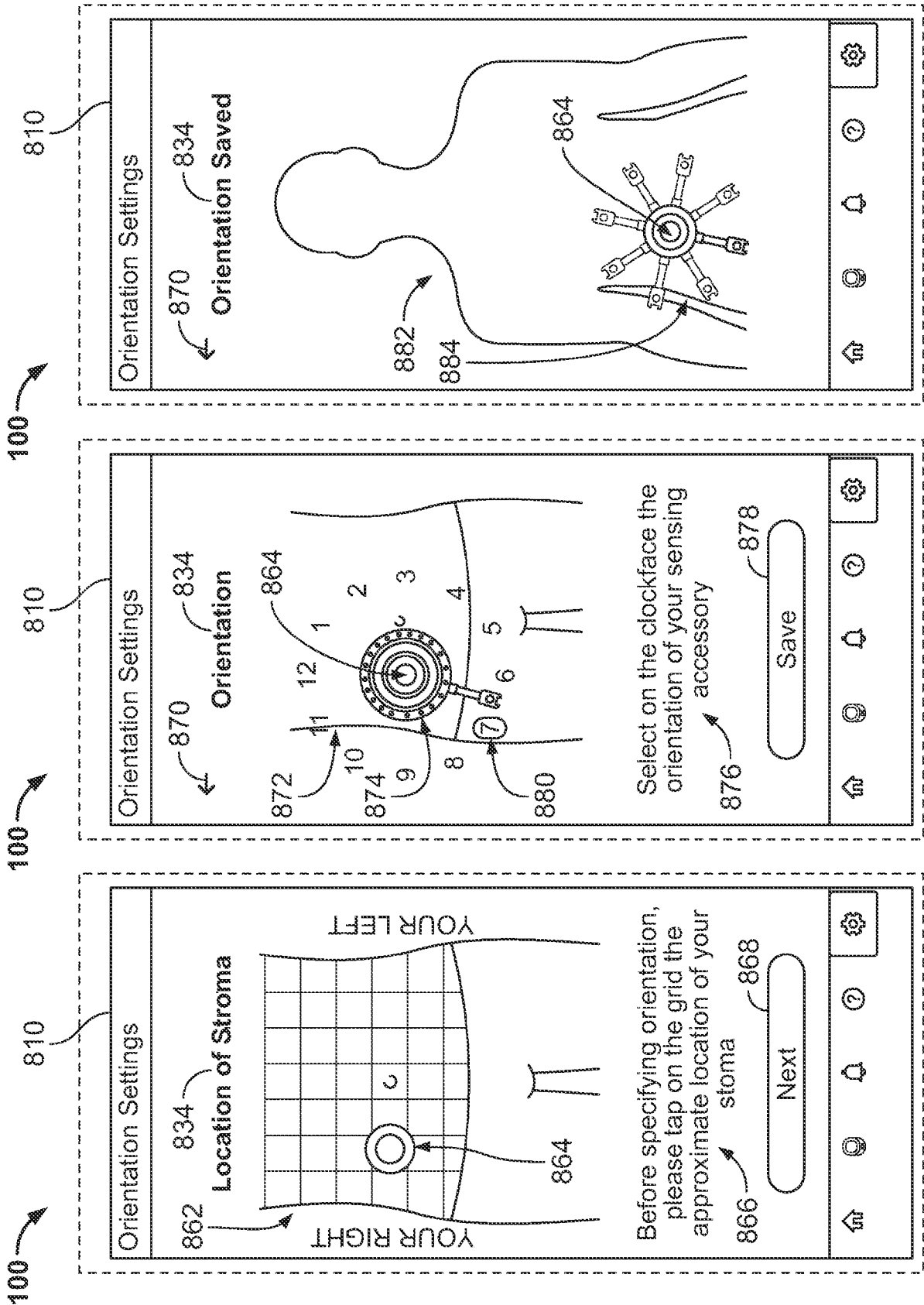


FIG. 9C

FIG. 9B

FIG. 9A

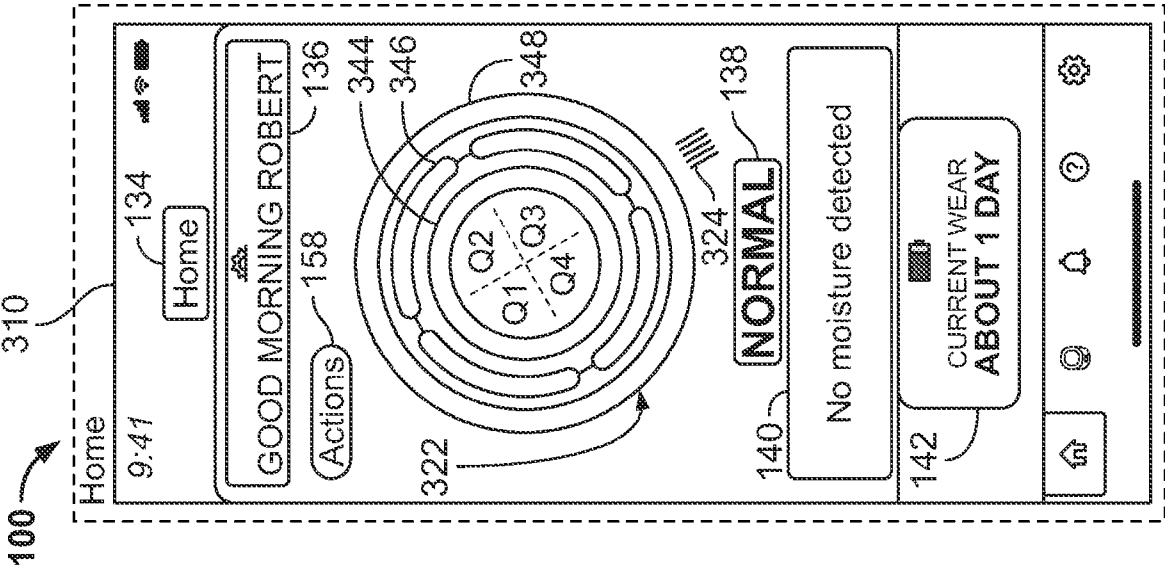


FIG. 9D

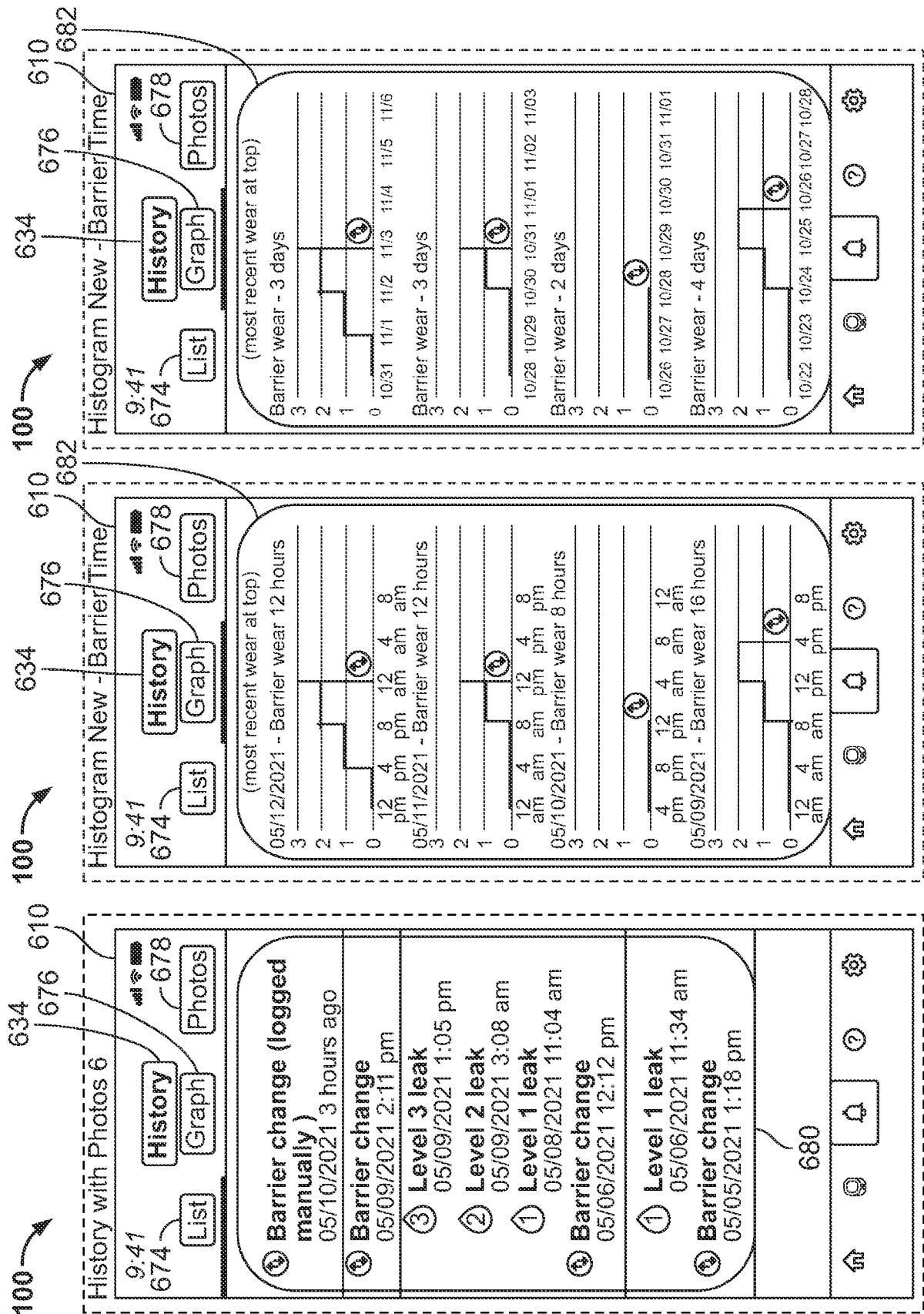


FIG. 10C

FIG. 10B

FIG. 10A

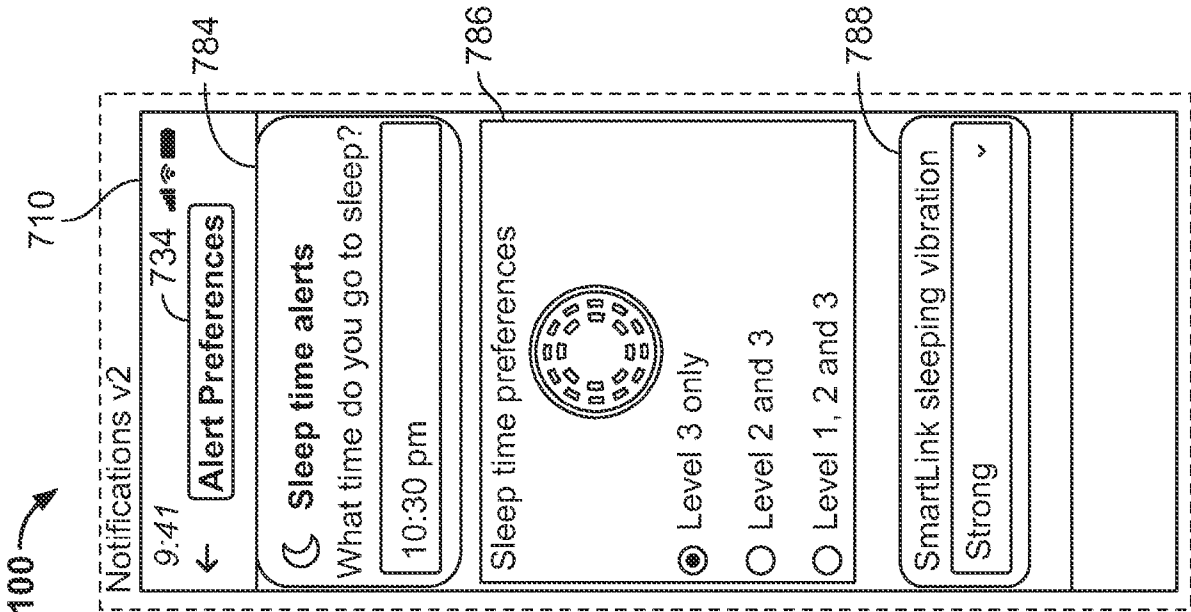


FIG. 11B

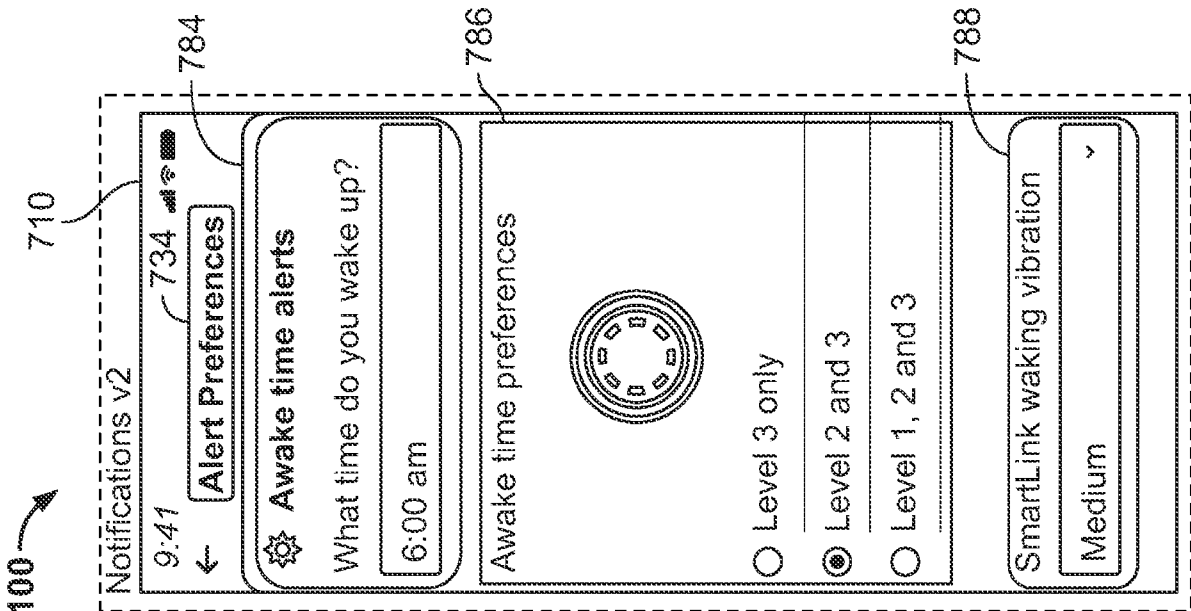


FIG. 11A

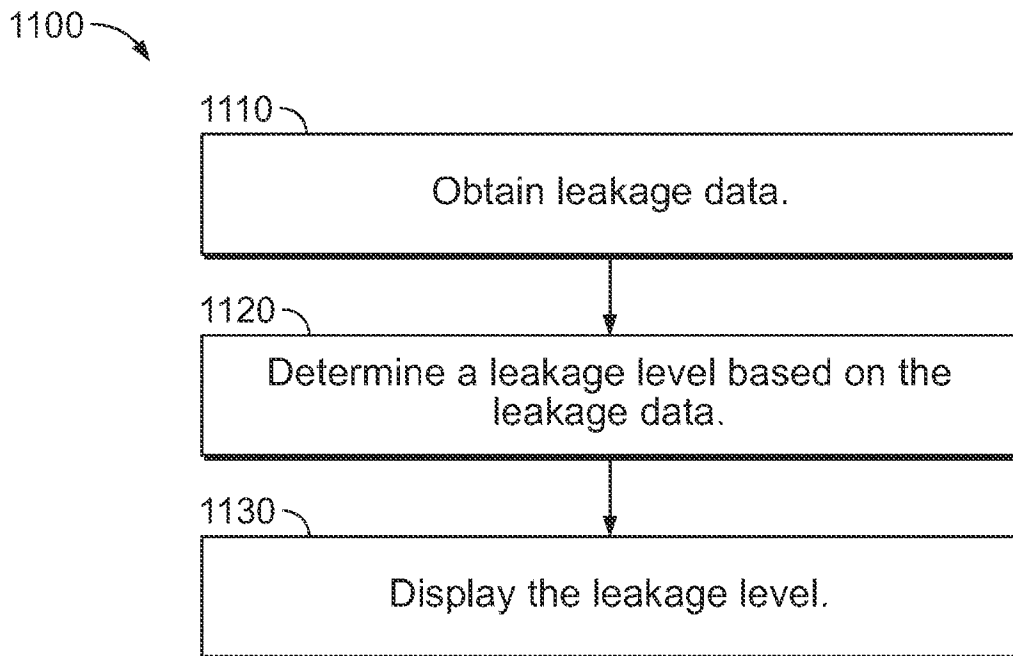


FIG. 12

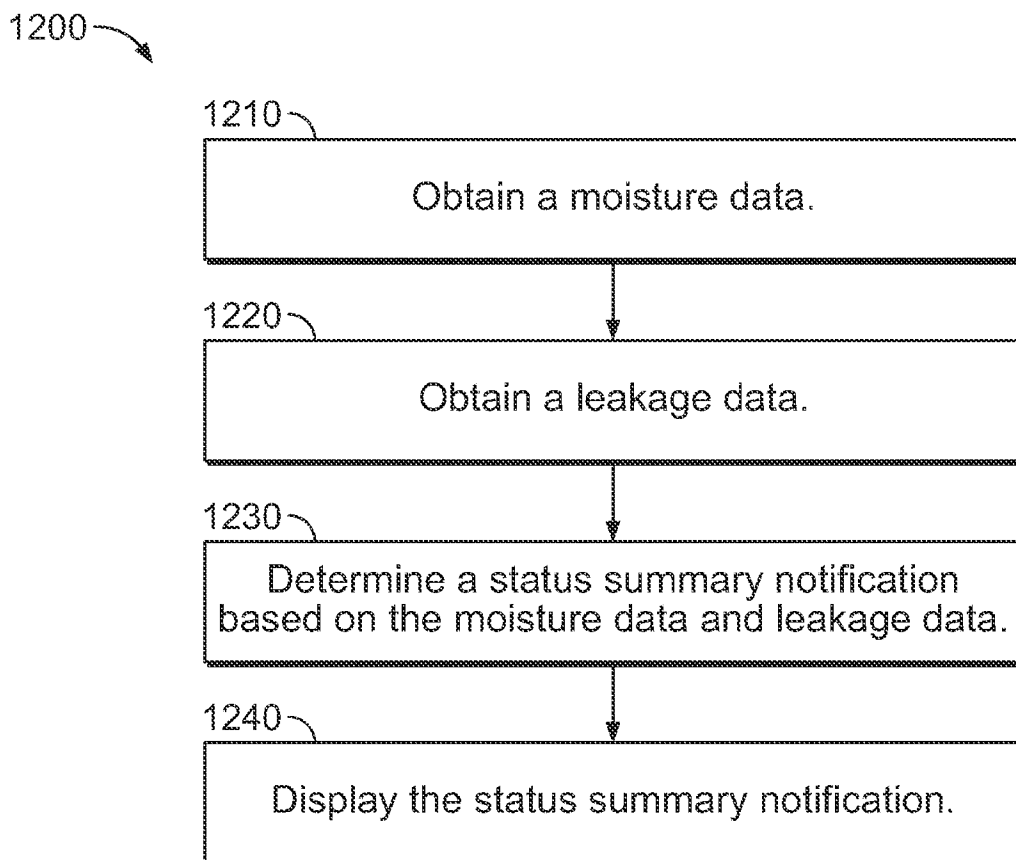
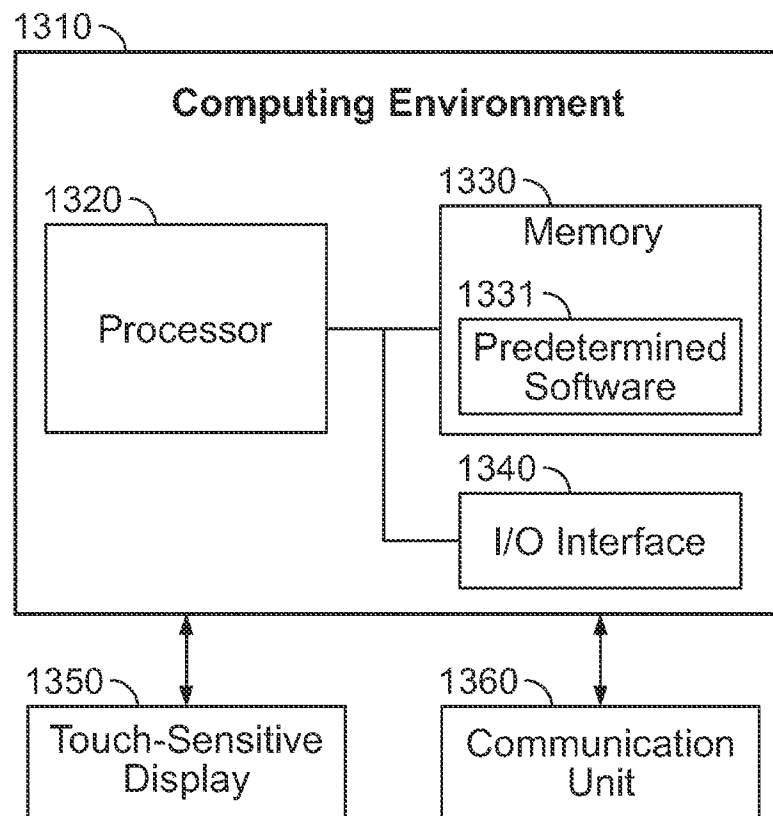


FIG. 13

**FIG. 14**

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2024/034531

A. CLASSIFICATION OF SUBJECT MATTER INV. A61F5/44 A61F5/445 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) A61F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2020/252458 A1 (HOLLISTER INC [US]) 17 December 2020 (2020-12-17) figures 4-6 paragraphs [0007], [0052] - [0059], [0066] - [0069], [0078], [0085], [0092], [0108] -----	1-10, 19-22
X	US 2021/059603 A1 (SVANEGAARD MADS HINDHEDE [DK] ET AL) 4 March 2021 (2021-03-04) figures 6, 11-13c paragraphs [0164] - [0237], [0263] - [0304] ----- -/-	1-8, 19-22
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 10 September 2024		Date of mailing of the international search report 11/11/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Harnack, Hanna

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2024/034531

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2020/375783 A1 (HANSEN JAIS ASK [DK] ET AL) 3 December 2020 (2020-12-03) figures 6, 11 paragraphs [0104] - [0121], [0278] - [0285], [0293] - [0299], [0322] - [0325], [0358], [0380] -----	1 - 10, 19 - 22
X	WO 2021/242603 A1 (HOLLISTER INC [US]) 2 December 2021 (2021-12-02) figures 10, 24, 25 paragraphs [0009], [0032], [0061], [0062], [0010] - [0106] -----	1, 5, 7, 9, 10, 19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2024/034531

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims;; it is covered by claims Nos.:
1 - 10, 19 - 22

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10, 19-22

A method for displaying leakage information for an ostomy leakage detection system comprising: displaying, on a touch screen display, a leakage summary notification, wherein the leakage summary notification indicates a status of the sensing accessory, further obtaining leakage data, wherein the leakage data comprises input corresponding to a detection of leakage on at least one sensing ring of a sensing accessory; determining the leakage summary notification for display based on the leakage data.

2. claims: 11-18

A method for displaying leakage information for an ostomy leakage detection system comprising: displaying, on a touch screen display, a leakage summary notification, wherein the leakage summary notification indicates a status of the sensing accessory, further displaying a sensing region interface element that indicates a leakage detected, wherein the sensing region interface element comprises a first ring interface element and a second ring interface element, and wherein the first ring interface element indicates a leakage is detected on an inner ring of a sensing accessory and the second ring interface element indicate a leakage is detected on an outer ring of the sensing accessory; displaying a leakage level, wherein the leakage level indicates a progression of a leakage detected; and wherein the leakage summary notification indicates whether to change the sensing accessory.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2024/034531

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