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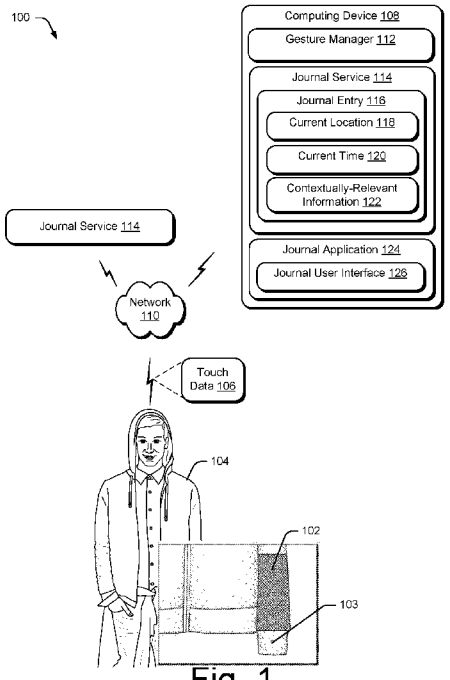

Fig. 1

(57) Abstract: This document describes triggering a journal entry from a wearable device. A wearable device worn by a user is configured to enable the user to trigger the creation of the journal entry with a gesture to the wearable device. To do so, the wearable device detects touch- input (e.g., a gesture), and in response, communicates touch data representative of the touch-input to a computing device to cause a journal entry to be created. The journal entry includes a current location of the user and a current time, as well as contextually-relevant information associated with the current location and time, such as an activity of the user (e.g., walking, riding a bike, or jogging), images of the location, nearby places of interest (e.g., restaurants, gyms, or hotels), nearby friends, weather at the current location and time, or social media associated with the current location and time, to name just a few.

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TRIGGERING A JOURNAL ENTRY FROM A WEARABLE DEVICE

BACKGROUND

[0001] Throughout a typical day, a user may travel to a variety of different locations while performing different activities, such as walking, jogging, riding a bicycle, or driving a car. The user may mentally note that he would like to return to this location at a later time, or that there is something about the location that he wants to remember. However, these moments are often forgotten by the user. A user could use his smartphone, or a pen and paper, to record information about the location, but doing so is often time consuming or inefficient.

SUMMARY

[0002] This document describes triggering a journal entry from a wearable device. A wearable device worn by a user is configured to enable the user to trigger the creation of the journal entry with a gesture to the wearable device. To do so, the wearable device detects touch-input (e.g., a gesture), and in response, communicates touch data representative of the touch-input to a computing device to cause a journal entry to be created. The journal entry includes a current location of the user and a current time, as well as contextually-relevant information associated with the current location and time, such as an activity of the user (e.g., walking, riding a bike, or jogging), images of the location, nearby places of interest (e.g., restaurants, gyms, or hotels), nearby friends, weather at the

current location and time, or social media associated with the current location and time, to name just a few.

[0003] The journal entry can then be accessed by the user, immediately or at a later time, so that the user can view, classify, or edit the journal entry, such as by adding additional information to the journal entry. The journal entry may also facilitate the process of the user taking a further action, such as by placing a call to a nearby restaurant or using a map application to navigate back to the location.

[0004] In one or more implementations, the wearable device is an interactive garment (e.g., a jacket or shirt) that includes an interactive textile that is configured to detect the touch-input. In this case, the user can make a simple gesture to the garment to trigger the journal entry, such as by touching or swiping the user's shirt sleeve. The interactive garment is wirelessly coupled with a computing device (e.g., the user's smartphone) such that communicating the touch data causes the computing device to create the journal entry.

[0005] Accordingly, the described implementations provide a gesture manager configured to receive touch data from a wearable device worn by a user, and determine that the touch data corresponds to a request to create a journal entry; and a journal service configured to: determine a current location of the user and a current time in response to the touch data corresponding to the request to create the journal entry; collect contextually-relevant information associated with at least one of the current location of the user and the current time; and create a journal entry that includes the current location of the user, the current time, and the contextually-relevant information. The gesture manager and journal

service may typically be implemented at least partially in hardware, for example using software executing on suitable computer apparatus elements.

[0006] The described implementations also provide corresponding methods, and computer readable media carrying computer software arranged to put into effect such methods when implemented on suitable computer apparatus. Additionally, the described implementations include a wearable device for use with the above system and methods, such as an interactive garment, which may be configured to communicate with suitable computer apparatus elements to put aspects of triggering a journal entry for a wearable device into effect.

[0007] This summary is provided to introduce simplified concepts concerning triggering a journal entry from a wearable device, which is further described below in the Detailed Description. This summary is not intended to identify essential features of the claimed subject matter, nor is it intended for use in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Embodiments of techniques and devices for triggering a journal entry from a wearable device are described with reference to the following drawings. The same numbers are used throughout the drawings to reference like features and components:

Fig. 1 is an illustration of an example environment in which triggering a journal entry from a wearable device can be implemented.

Fig. 2 illustrates an example of an interactive garment.

Fig. 3 illustrates an example of an interactive textile in accordance with one or more implementations.

Fig. 4 illustrates an example method of triggering a journal entry by providing touch-input to an interactive garment.

Fig. 5 illustrates an example method of creating a journal entry that is triggered by user-input to a wearable device.

Fig. 6A illustrates an example of receiving touch-input to an interactive textile.

Fig. 6B illustrates an example of a journal user interface in accordance with one or more implementations.

Fig. 6C illustrates an example of a journal entry displayed in the journal user interface.

Fig. 6D illustrates an additional example of the journal user interface.

Fig. 7 illustrates various components of an example computing system that can be implemented as any type of client, server, and/or computing device as described with reference to the previous Figs. 1-6 to implement triggering a journal entry from a wearable device.

DETAILED DESCRIPTION

Overview

[0009] This document describes triggering a journal entry from a wearable device. A wearable device worn by a user is configured to enable the user to trigger the

creation of the journal entry with a gesture to the wearable device. To do so, the wearable device detects touch-input (e.g., a gesture), and in response, communicates touch data representative of the touch-input to a computing device to cause a journal entry to be created. The journal entry includes a current location of the user and a current time, as well as contextually-relevant information associated with the current location and time.

[0010] Generally, the contextually-relevant information may include information such as an activity of the user (e.g., walking, riding a bike, or jogging), images of the location, nearby businesses (e.g., restaurants, gyms, or hotels), nearby friends, weather at the current location and time, or social media associated with the current location and time, to name just a few. Thus, the journal entry provides a snapshot of the time and place at which the user triggered the journal entry. The contextually-relevant information may include information that the user is likely to find interesting about the current location. For example, if the user triggers a journal entry nearby a popular restaurant, then it can be predicted that the user would like the journal entry to include information about the popular restaurant. Alternately or additionally, the contextually relevant information may include information that the user may not be aware of, such as a great speakeasy bar that is not visible from the street. In this way, the journal entry may assist the user in discovering new things about a particular place.

[0011] The journal entry can then be accessed by the user (e.g., immediately or at a later time) so that the user can view, classify, or edit the journal entry, such as by adding additional information to the journal entry. The journal entry may also facilitate the process of the user taking a further action, such as by placing a call to a nearby

restaurant or using a map application to navigate back to the location. Thus, the journal entry enables the user to take less steps in order to perform actions associated with a particular location.

[0012] In one or more implementations, the wearable device is an interactive garment (e.g., a jacket or shirt) that includes an interactive textile that is configured to detect the touch-input. In this case, the user can make a single gesture to the garment to trigger the journal entry, such as by touching or swiping the user's shirt sleeve. The interactive garment is wirelessly coupled with a computing device (e.g., the user's smartphone) such that communicating the touch data causes the computing device to create the journal entry. Thus, the journal entry 116 is created without additional user-input other than the single gesture to the interactive garment 104.

[0013] As an example of triggering a journal entry, consider that a user arrives in a new city, and decides to go for a run through the city to get acquainted with some of the areas of the city. During the user's run, the user runs through a beautiful city square filled with thousands of people sitting out on patios. The user would like to come back to this area at a later time, and thus the user can make a simple gesture (e.g., a swipe) to the interactive textile integrated on the sleeve of the user's jacket. This gesture triggers the creation of a journal entry that includes the geographical location of the city square and the current time. In addition, the journal entry may include contextually-relevant information associated with the current location and time, such as the user's activity level (which in this example is "running"), a list of nearby restaurants, social media posts related to the location, and an image of the location.

[0014] Later, when the user returns from his run, he can open up a journal application on his smartphone or computer to view the journal entry, which will include the geographical location of the city square, an image of the city square, a list of nearby restaurants, and so forth. The user can then easily take an action, such as by navigating back to the city square via a map application or by calling one of the nearby restaurants to make a dinner reservation. Notably, the information that is available to the user is much richer than simply an indication of the location of the place of interest. For example, instead of a location pin that indicates that the city square is located at the corner of 1st and Bernard, the journal entry indicates that the city square is located on the corner of 1st and Bernard, includes an image of the city square and a list of nearby restaurants, and indicates that the journal entry was created on Saturday at 11 am while the user was running.

[0015] Enabling the triggering of the journal entry with a simple gesture to an interactive garment makes it easy for the user to create journal entries. For example, the user does not need to fiddle around with the user interface of a smartwatch or smartphone in order trigger the creation of the journal entry. In fact, the user may be able to provide the gesture to the interactive garment without even looking at the garment. This may be particularly beneficial when the user is actively moving through the location, such as by running or riding a bike. In addition, a simple gesture to a garment is discreet and thus enables the user to create journal entries in a crowded setting without the need to take out his smartphone or other electronic device.

[0016] In one or more implementations, different gestures may be mapped to different actions associated with a journal entry. For example, a first gesture may be used

to create a journal entry, while a second journal entry may be used to set a reminder to act on the journal entry, such as by accessing the journal entry to call a restaurant to schedule a reservation.

Example Environment

[0017] Fig. 1 is an illustration of an example environment 100 in which triggering a journal entry from a wearable device can be implemented. Environment 100 includes an interactive textile 102, which is shown as being integrated within an interactive garment 104, which in this example is illustrated as a jacket. Interactive textile 102 is a textile that is configured to sense multi-touch input. As described herein, a textile corresponds to any type of flexible woven material consisting of a network of natural or artificial fibers, often referred to as thread or yarn. Textiles may be formed by weaving, knitting, crocheting, knotting, or pressing threads together.

[0018] While interactive textile 102 is illustrated as being integrated within a jacket, it is to be appreciated that interactive textile 102 may be integrated within any type of flexible object made from fabric or a similar flexible material, such as articles of clothing, hats, handbags, blankets, shower curtains, towels, sheets, bed spreads, or fabric casings of furniture, to name just a few. As discussed in more detail below, interactive textile 102 may be integrated within interactive garment 104 in a variety of different ways, including weaving, sewing, gluing, and so forth. In one or more implementations, interactive garment 104 may utilize touch sensors other than interactive textile 102 in order to implement the described techniques. Further, in some cases, a wearable device other

than an interactive garment (e.g., a smart watch, a smart ring, or smart glasses) may be used to implement the described techniques.

[0019] Interactive garment 104 is configured to detect touch-input (e.g., a gesture) from a user, and communicate touch data 106 representative of the touch-input to a computing device 108 via a network 110. Interactive garment 104 may also include an output device 103 (e.g., a light source, a speaker, a display, or a vibration component). The output device can be controlled to provide feedback to the user, such as by providing a visual, audio, and/or haptic output (e.g., flashing light, beeping, or vibrating) indicating that touch-input to create a journal entry was detected.

[0020] Receipt of the touch data, causes a gesture manager 112 to analyze the touch data to determine whether the touch data corresponds to a gesture to create a new journal entry. For example, a user gesture (e.g., a swipe) to interactive textile 102 can be configured to trigger the creation of a journal entry. Thus, if it is determined that the touch data 106 corresponds to the gesture to create a new journal entry, a journal service 114 is triggered to create a journal entry 116, which includes a current location 118 of the user, a current time 120, and contextually-relevant information 122 associated with the current location 118 and current time 120. For example, contextually-relevant information 122 may include an activity of the user (e.g., walking, riding a bike, or jogging), images of the location, nearby places of interest (e.g., restaurants, gyms, or hotels), nearby friends, weather at the current location and time, or social media (e.g., Instagram® posts) associated with the current location and time, to name just a few.

[0021] In one or more implementations, journal service 114 is partially implemented at computing device 108 and partially implemented as a remote service (e.g., a cloud-based service) that is remote from computing device 108. For example, journal service 114 may be partially implemented at device 108 which is being worn, held, or otherwise attached to the user (e.g., a smartphone or smartwatch). When the touch data 106 is received, the journal service 114 at device 108 determines the current location 118 using a location sensor (e.g., a GPS sensor) and determines the current time 120 using a clock application. In addition, an activity of the user can be determined by journal service 114 using an activity or motion sensor. Then, the current location 118, time 120, and/or activity is communicated to the remote journal service 114 via network 110 as a query. The remote journal service 114 may then determine the contextually-relevant information 122, such as by performing a web search for places of interest proximate the current location. In this way, the journal service 114 at device 108 determines the initial information about the user's location, time, or activity, while the remote journal service 114 determines the contextually-relevant information 122 without requiring the use of processing or power resources of computing device 108.

[0022] Environment 100 further includes a journal application 124, which is implemented at computing device 108 or at other computing devices at which the user has installed and registered the journal application 124. Journal application 124 is configured to cause display of a journal user interface 126 that includes journal entries 116. Doing so enables the user to access the journal entries 116 via journal user interface 126, immediately following creation of the journal entry 116 or at a later time, in order to view,

classify, or edit the journal entry 116, such as by adding additional information to the journal entry 116. The journal application 124 may also facilitate the process of the user taking a further action, such as by placing a call to a nearby restaurant to schedule a reservation, contacting a nearby friend, using a map application to navigate back to the location, and so forth.

[0023] Gesture manager 112, journal service 114, and journal application 124 may be implemented by one or more computing devices, which may be configured in a variety of different ways. A computing device, for instance, may be configured as a desktop computer, a laptop computer, a mobile device (e.g., assuming a handheld configuration such as a tablet or mobile phone), and so forth. Thus, a computing device may range from full resource devices with substantial memory and processor resources (e.g., personal computers, game consoles) to a low-resource device with limited memory and/or processing resources (e.g., mobile devices). Additionally, although a single computing device is described in some instances, the computing device may be representative of a plurality of different devices, such as multiple servers utilized by a business to perform operations "over the cloud" for the journal service 114. In Fig. 1, journal service 114 is illustrated as being partially implemented at computing device 108 and partially implemented remote from computing device 108. It is to be noted, however, that in some implementations journal service 114 may be implemented at a single device.

[0024] Network 110 includes one or more of many types of wireless or partly wireless communication networks, such as a local-area-network (LAN), a wireless local-area-network (WLAN), a personal-area-network (PAN), a wide-area-network (WAN), an

intranet, the Internet, a peer-to-peer network, point-to-point network, a mesh network, and so forth. Further, although a single network 110 is shown, network 110 may also be configured to include multiple networks. For example, interactive garment 104 and computing device 108 may be coupled via a first type of network 110 (e.g., a Bluetooth® network connection), and computing device 108 and the remote journal service 114 may be coupled via a second type of network 110 (e.g., the Internet).

[0025] Fig. 2 illustrates an example 200 of interactive garment 104. In example 200, interactive textile 102 is integrated in interactive garment 104, which may be implemented as any type of flexible object (*e.g.*, a jacket, shirt, hat, or handbag).

[0026] Interactive textile 102 is configured to sense multi-touch-input from a user when one or more fingers of the user's hand touch interactive textile 102. Interactive textile 102 may also be configured to sense full-hand touch-input from a user, such as when an entire hand of the user touches or swipes interactive textile 102. To enable this, interactive textile 102 includes a capacitive touch sensor 202, a textile controller 204, and a power source 206.

[0027] Capacitive touch sensor 202 is configured to sense touch-input when an object, such as a user's finger, hand, or a conductive stylus, approaches or makes contact with capacitive touch sensor 202. Unlike conventional hard touch pads, capacitive touch sensor 202 uses a grid of conductive thread 208 woven into interactive textile 102 to sense touch-input. Thus, capacitive touch sensor 202 does not alter the flexibility of interactive textile 102, which enables interactive textile 102 to be easily integrated within interactive garments 104.

[0028] Power source 206 is coupled to textile controller 204 to provide power to textile controller 204, and may be implemented as a small battery. Textile controller 204 is coupled to capacitive touch sensor 202. For example, wires from the grid of conductive threads 208 may be connected to textile controller 204 using flexible PCB, creping, gluing with conductive glue, soldering, and so forth.

[0029] In one or more implementations, interactive textile 102 (or interactive garment 104) may also include one or more output devices 103, such as light sources (e.g., LED's), displays, speakers, or vibration components. In this case, the output devices may also be connected to textile controller 204 to enable textile controller 204 to control their output, such as to provide feedback to the user indicating touch-input to create journal entry 116 was detected.

[0030] Textile controller 204 is implemented with circuitry that is configured to detect the location of the touch-input on the grid of conductive thread 208, as well as motion of the touch-input. When an object, such as a user's finger, touches capacitive touch sensor 202, the position of the touch can be determined by controller 204 by detecting a change in capacitance on the grid of conductive thread 208. Textile controller 204 uses the touch-input to generate touch data usable to control computing device 108. For example, the touch-input can be used to determine various gestures, such as single-finger touches (*e.g.*, touches, taps, and holds), multi-finger touches (*e.g.*, two-finger touches, two-finger taps, two-finger holds, and pinches), single-finger and multi-finger swipes (*e.g.*, swipe up, swipe down, swipe left, swipe right), and full-hand interactions (*e.g.,* touching the textile with a user's entire hand, covering textile with the user's entire hand, pressing

the textile with the user's entire hand, palm touches, and rolling, twisting, or rotating the user's hand while touching the textile). Capacitive touch sensor 202 may be implemented as a self-capacitance sensor, or a projective capacitance sensor, which is discussed in more detail below.

[0031] Interactive garment 104 may also include network interfaces 210 for communicating data, such as the touch data, over wired, wireless, or optical networks to gesture manager 112. By way of example and not limitation, network interfaces 210 may communicate data over a local-area-network (LAN), a wireless local-area-network (WLAN), a personal-area-network (PAN) (*e.g.*, Bluetooth™), a wide-area-network (WAN), an intranet, the Internet, a peer-to-peer network, point-to-point network, a mesh network, and the like (*e.g.*, through network 110 of Fig. 1). As described above, if it is determined that the touch data corresponds to a control to create a new journal entry 116, then journal service 114 can automatically create a new journal entry 116 which includes contextually-relevant information 122.

[0032] Having discussed a system in which interactive textile 102 can be implemented, now consider a more-detailed discussion of interactive textile 102.

[0033] Fig. 3 illustrates an example 300 of interactive textile 102 in accordance with one or more implementations. In this example, interactive textile 102 includes non-conductive threads 302 woven with conductive threads 208 to form interactive textile 102. Non-conductive threads 302 may correspond to any type of non-conductive thread, fiber, or fabric, such as cotton, wool, silk, nylon, polyester, and so forth.

[0034] At 304, a zoomed-in view of conductive thread 208 is illustrated. Conductive thread 208 includes a conductive wire 306 twisted with a flexible thread 308. Twisting conductive wire 306 with flexible thread 308 causes conductive thread 208 to be flexible and stretchy, which enables conductive thread 208 to be easily woven with non-conductive threads 302 to form interactive textile 102.

[0035] In one or more implementations, conductive wire 306 is a thin copper wire. It is to be noted, however, that conductive wire 306 may also be implemented using other materials, such as silver, gold, or other materials coated with a conductive polymer. Flexible thread 308 may be implemented as any type of flexible thread or fiber, such as cotton, wool, silk, nylon, polyester, and so forth.

[0036] Interactive textile 102 can be formed cheaply and efficiently, using any conventional weaving process (e.g., jacquard weaving or 3D-weaving), which involves interlacing a set of longer threads (called the warp) with a set of crossing threads (called the weft). Weaving may be implemented on a frame or machine known as a loom, of which there are a number of types. Thus, a loom can weave non-conductive threads 302 with conductive threads 208 to create interactive textile 102.

[0037] In example 300, conductive thread 208 is woven into interactive textile 102 to form a grid that includes a set of substantially parallel conductive threads 208 and a second set of substantially parallel conductive threads 208 that crosses the first set of conductive threads to form the grid. In this example, the first set of conductive threads 208 are oriented horizontally and the second set of conductive threads 208 are oriented vertically, such that the first set of conductive threads 208 are positioned substantially

orthogonal to the second set of conductive threads 208. It is to be appreciated, however, that conductive threads 208 may be oriented such that crossing conductive threads 208 are not orthogonal to each other. For example, in some cases crossing conductive threads 208 may form a diamond-shaped grid. While conductive threads 208 are illustrated as being spaced out from each other in Fig. 3, it is to be noted that conductive threads 208 may be weaved very closely together. For example, in some cases two or three conductive threads may be weaved closely together in each direction.

[0038] Conductive wire 306 may be insulated to prevent direct contact between crossing conductive threads 208. To do so, conductive wire 306 may be coated with a material such as enamel or nylon. Alternately, rather than insulating conductive wire 306, interactive textile may be generated with three separate textile layers to ensure that crossing conductive threads 208 do not make direct contact with each other.

[0039] During operation, capacitive touch sensor 202 may be configured to determine positions of touch-input on the grid of conductive thread 208 using self-capacitance sensing or projective capacitive sensing.

[0040] When configured as a self-capacitance sensor, textile controller 204 charges crossing conductive threads 208 (e.g., horizontal and vertical conductive threads) by applying a control signal (e.g., a sine signal) to each conductive thread 208. When an object, such as the user's finger, touches the grid of conductive thread 208, the conductive threads 208 that are touched are grounded, which changes the capacitance (e.g., increases or decreases the capacitance) on the touched conductive threads 208.

[0041] Textile controller 204 uses the change in capacitance to identify the presence of the object. To do so, textile controller 204 detects a position of the touch-input by detecting which horizontal conductive thread 208 is touched, and which vertical conductive thread 208 is touched by detecting changes in capacitance of each respective conductive thread 208. Textile controller 204 uses the intersection of the crossing conductive threads 208 that are touched to determine the position of the touch-input on capacitive touch sensor 202. For example, textile controller 204 can determine touch data by determining the position of each touch as X,Y coordinates on the grid of conductive thread 208.

[0042] When implemented as a self-capacitance sensor, "ghosting" may occur when multi-touch input is received. Consider, for example, that a user touches the grid of conductive thread 208 with two fingers. When this occurs, textile controller 204 determines X and Y coordinates for each of the two touches. However, textile controller 204 may be unable to determine how to match each X coordinate to its corresponding Y coordinate. For example, if a first touch has the coordinates X1, Y1 and a second touch has the coordinates X4,Y4, textile controller 204 may also detect "ghost" coordinates X1, Y4 and X4,Y1.

[0043] In one or more implementations, textile controller 204 is configured to detect "areas" of touch-input corresponding to two or more touch-input points on the grid of conductive thread 208. Conductive threads 208 may be weaved closely together such that when an object touches the grid of conductive thread 208, the capacitance will be changed for multiple horizontal conductive threads 208 and/or multiple vertical conductive

threads 208. For example, a single touch with a single finger may generate the coordinates X1,Y1 and X2,Y1. Thus, textile controller 204 may be configured to detect touch-input if the capacitance is changed for multiple horizontal conductive threads 208 and/or multiple vertical conductive threads 208. Note that this removes the effect of ghosting because textile controller 204 will not detect touch-input if two single-point touches are detected which are spaced apart.

[0044] Alternately, when implemented as a projective capacitance sensor, textile controller 204 charges a single set of conductive threads 208 (e.g., horizontal conductive threads 208) by applying a control signal (e.g., a sine signal) to the single set of conductive threads 208. Then, textile controller 204 senses changes in capacitance in the other set of conductive threads 208 (e.g., vertical conductive threads 208).

[0045] In this implementation, vertical conductive threads 208 are not charged and thus act as a virtual ground. However, when horizontal conductive threads 208 are charged, the horizontal conductive threads capacitively couple to vertical conductive threads 208. Thus, when an object, such as the user's finger, touches the grid of conductive thread 208, the capacitance changes on the vertical conductive threads (e.g., increases or decreases). Textile controller 204 uses the change in capacitance on vertical conductive threads 208 to identify the presence of the object. To do so, textile controller 204 detects a position of the touch-input by scanning vertical conductive threads 208 to detect changes in capacitance. Textile controller 204 determines the position of the touch-input as the intersection point between the vertical conductive thread 208 with the changed capacitance, and the horizontal conductive thread 208 on which the control signal was transmitted. For

example, textile controller 204 can determine touch data by determining the position of each touch as X,Y coordinates on the grid of conductive thread 208.

[0046] Whether implemented as a self-capacitance sensor or a projective capacitance sensor, capacitive sensor 208 is configured to communicate the touch data to gesture manager 112 to enable a determination of whether the touch data 106 corresponds to a gesture to create a journal entry 116. If the touch data 106 does correspond to the journaling gesture, then this determination triggers the automatic creation of a new journal entry 116.

[0047] Gesture manager 112 can be implemented to recognize a variety of different types of gestures, such as touches, taps, swipes, holds, and covers made to interactive textile 102. To recognize the various different types of gestures, gesture manager 112 is configured to determine a duration of the touch, swipe, or hold (e.g., one second or two seconds), a number of the touches, swipes, or holds (e.g., a single tap, a double tap, or a triple tap), a number of fingers of the touch, swipe, or hold (e.g., a one finger-touch or swipe, a two-finger touch or swipe, or a three-finger touch or swipe), a frequency of the touch, and a dynamic direction of a touch or swipe (e.g., up, down, left, right). With regards to holds, gesture manager 112 can also determine an area of capacitive touch sensor 202 of interactive textile 102 that is being held (e.g., top, bottom, left, right, or top and bottom. Thus, gesture manager 112 can recognize a variety of different types of holds, such as a cover, a cover and hold, a five finger hold, a five finger cover and hold, a three finger pinch and hold, and so forth.

Example Methods

[0048] Figs. 4 and 5 illustrate an example method 400 (Fig. 4) of triggering creation of a journal entry by providing touch-input to an interactive garment and an example method 500 (Fig. 5) of creating a journal entry that is triggered by user-input to a wearable device. These methods and other methods herein are shown as sets of blocks that specify operations performed but are not necessarily limited to the order or combinations shown for performing the operations by the respective blocks. The techniques are not limited to performance by one entity or multiple entities operating on one device.

[0049] Fig. 4 illustrates an example method 400 of triggering creation of a journal entry by providing touch-input to an interactive garment.

[0050] At 402, touch-input to an interactive garment is detected. For example, textile controller 204 detects touch-input to the interactive textile 102 which is integrated within interactive garment 104 when an object, such as a user's finger, touches interactive textile 102.

[0051] As an example, consider Fig. 6A which illustrates an example of receiving touch-input to an interactive textile. At 602, touch-input is received when a user provides a single finger touch to interactive textile 102 of interactive garment 104. As another example, at 604, touch-input is received when a user provides a "hold" gesture to interactive textile 102 by placing their hand over interactive textile 102. Of course, other types of touch-input may also be received, such as swipes, multi-finger touches, and so forth.

[0052] At 404, touch data representative of the touch-input is communicated to a remote device to cause the creation of a journal entry which includes a current location of a user wearing the interactive garment, a current time, and contextually-relevant information associated with the current location and time. For example, controller 204 initiates communication of touch data 106 representative of the touch-input to a remote device (e.g., computing device 108), via network 110, to cause the creation of a journal entry 116 which includes current location 118, current time 120, and contextually-relevant information 122. As discussed throughout, in some cases, the touch data 106 may be communicated to journal service 114 implemented at a device (e.g., the user's smartphone) coupled to interactive textile 102 (e.g., via a Bluetooth connection). Alternately or additionally, the touch data 106 may be communicated to a cloud-based service (e.g., remote journal service 114) via the Internet.

[0053] Optionally, at 406, the interactive garment is controlled to provide feedback indicating detection of the touch-input or creation of the journal entry. For example, textile controller 204 can control one or more output devices 103 to provide feedback indicating the touch-input was detected, such as by controlling a light source to blink or controlling a vibration component to vibrate. As another example, textile controller 204 can control one or more output device 103 to provide feedback indicating creation of journal entry 116. In Fig. 6A, for instance, an LED 606 is integrated into the sleeve of interactive garment 104, and is controlled to output light (e.g., by blinking) in response to detecting the touch-input or in response to confirming that the touch-input caused the journal entry 116 to be created.

[0054] Fig. 5 illustrates an example method 500 of creating a journal entry that is triggered by user-input to a wearable device.

[0055] At 502, touch data is received from a wearable device worn by a user. For example, gesture manager 112 receives touch data 106 from a wearable device when user-input is provided to the wearable device. For example, touch data 106 can be generated when gesture input is provided to interactive textile 102 integrated within interactive garment 104, as described throughout. Alternately, the touch data 106 may be received from user-input to a different type of wearable device, such as a smart watch, a smart ring, and so forth. Other types of user input are also contemplated, such as user input to wearable glasses, and so forth.

[0056] At 504, it is determined whether the touch data corresponds to a request to create a journal entry. For example, gesture manager 112 determines whether touch data 106 corresponds to a user input or gesture that is mapped to a request to create a journal entry 116. As described throughout, any type of user input or gesture may be used to trigger the creation of a journal entry 116, such as swiping, tapping, or holding interactive textile 102.

[0057] In one or more implementations, journal service 114 enables the user to configure the types of user input or gestures that can be used to trigger creation of the journal entry 116. Consider, for example, Fig. 6B which illustrates an example of journal user interface 126 in accordance with one or more implementations. At 608, journal user interface 126 enables the user to assign gestures to a journal action. In this example, a user assigns a “brush out” gesture to “create new journal entry”, and saves this assignment at

610. Notably, journal application 124 allows the user to assign a variety of different gestures to the "create new journal entry" control, such as "brush in", "double tap", and so forth. Assigning the gesture to the journal entry functionality enables the user to initiate the functionality, at a subsequent time, by inputting the gesture into interactive textile 102. In this example, the user can now make the "brush out" gesture on interactive textile 102 in order to cause creation of a new journal entry 116.

[0058] At 506, a current location of the user and a current time is determined in response to the touch data corresponding to the request to create the journal entry. For example, if it is determined that the touch data 106 corresponds to a request to create a journal entry, then journal service 114 determines a current location 118 of the user and a current time 120. Journal service 114 can determine the current location 118 and time 120 in a variety of different ways, such as by using location sensors, proximity sensors, a clock application, and so forth.

[0059] At 508, journal service 114 collects contextually-relevant information associated with the current location of the user or the current time. For example, journal service 114 collects contextually-relevant information 122. In one or more implementations, the contextually-relevant information 122 may include an activity that the user is currently engaged in, such as running, working out, driving a car, and so forth. In this instance, the activity may be determined based on sensor data received from activity or motion sensors that are implemented at computing device 108, interactive garment 104, or another device that is communicably coupled to computing device 108 (e.g., a wrist-

word activity tracker). For example, acceleration data from an accelerometer may indicate that the user is currently running, driving in a car, riding a bike, and so forth.

[0060] In one or more implementations, the current location 118 of the user, current time 120, and/or activity of the user can be communicated as a query to a remote journal service 114, which may be implemented remote from computing device 108. The remote journal service 114 may then determine at least some of the contextually-relevant information 122 that is related to the current location, time or activity of the user, such as business or places of interest nearby the current location, nearby friends, social media associated with the current location, images associated with the current location, events occurring during the current time, and so forth. In some cases, the user can configure journal service 114 to collect particular types of contextually-relevant information 122. For example, the user may want the journal service 114 to always collect weather information, but never to collect social media information.

[0061] At 510, a journal entry that includes the current location of the user, the current time, and the contextually-relevant information is created. For example, journal service 114 creates a new journal entry 116 that includes current location 118, current time 120, and contextually-relevant information 122.

[0062] At 512, the journal entry is displayed in a journal user interface. For example, journal service 114 causes display of one or more journal entries 116 in a journal user interface 126 on the display of computing device 108 (e.g., the user's smartphone). As an example, consider Fig. 6C, which illustrates an example of a journal entry 116 displayed in a journal user interface 126. In this example, journal user interface 126

includes a journal entry 116 corresponding to the user's "Afternoon on Valencia Street". Journal entry 116 includes contextually-relevant information 122, which in this example includes the geographical location at which the journal entry was triggered (Valencia Street), the time that the journal entry was triggered (Saturday, November 13 at 1:30pm), the weather (72 degrees and sunny), as well as a description of nearby places (the restaurants Locanda and West of Pecos). In addition, journal entry 116 includes an activity icon indicating that the use was "biking" when the journal entry was triggered.

[0063] In one or more implementations, journal application 124 enables the user to edit or add information to the journal entry 116 displayed in journal user interface 126. In Fig. 6C, for example, the journal user interface 126 enables a user to "add a description of this journal entry". The user can click on this control to add additional information or notes to the journal entry, such as a description of Valencia Street, what the user was doing at Valencia Street, a friend that the user met at Valencia Street, and so forth. Journal user interface 126 may also enable the user to classify the journal entry 116 into a particular category. For example, the user could maintain a list of journal entries for "places I want to eat", "beautiful locations in nature", and so forth. The journal user interface 126 may also enable the user to share a journal entry with a friend, such as via email or a social network.

[0064] In one or more implementations, journal application 124 enables the user to perform an action regarding the journal entry 116. As an example, consider Fig. 6D which illustrates an additional example of journal user interface 126. In this example, the user has selected the list of "Nearby Places" from the journal entry 116 displayed in

Fig. 6C. In response, a more-detailed view of the "nearby places" (Locanda and West of Pecos) are displayed in journal user interface 126. In one or more implementations, the user can select the more-detailed view of the nearby places, in order to view the place via a map application, such as google maps. For example, responsive to selecting the nearby place "Locanda", a view of the restaurant may be displayed in a maps application which enables the user to call the restaurant, write a review, navigate back to the restaurant, and so forth.

Example Computing System

[0065] Fig. 7 illustrates various components of an example computing system 700 that can be implemented as any type of client, server, and/or computing device as described with reference to the previous Figs. 1-6 to implement triggering a journal entry from a wearable device. In embodiments, computing system 700 can be implemented as one or a combination of a wired and/or wireless wearable device, System-on-Chip (SoC), and/or as another type of device or portion thereof. Computing system 700 may also be associated with a user (*e.g.,* a person) and/or an entity that operates the device such that a device describes logical devices that include users, software, firmware, and/or a combination of devices.

[0066] Computing system 700 includes communication devices 702 that enable wired and/or wireless communication of device data 704 (*e.g.*, received data, data that is being received, data scheduled for broadcast, data packets of the data, etc.). Device data 704 or other device content can include configuration settings of the device, media content

stored on the device, and/or information associated with a user of the device. Media content stored on computing system 700 can include any type of audio, video, and/or image data. Computing system 700 includes one or more data inputs 706 via which any type of data, media content, and/or inputs can be received, such as human utterances, touch data generated by interactive textile 102, user-selectable inputs (explicit or implicit), messages, music, television media content, recorded video content, and any other type of audio, video, and/or image data received from any content and/or data source.

[0067] Computing system 700 also includes communication interfaces 708, which can be implemented as any one or more of a serial and/or parallel interface, a wireless interface, any type of network interface, a modem, and as any other type of communication interface. Communication interfaces 708 provide a connection and/or communication links between computing system 700 and a communication network by which other electronic, computing, and communication devices communicate data with computing system 700.

[0068] Computing system 700 includes one or more processors 710 (*e.g.*, any of microprocessors, controllers, and the like), which process various computer-executable instructions to control the operation of computing system 700 and to enable techniques for, or in which can be embodied, interactive textiles. Alternatively or in addition, computing system 700 can be implemented with any one or combination of hardware, firmware, or fixed logic circuitry that is implemented in connection with processing and control circuits which are generally identified at 712. Although not shown, computing system 700 can include a system bus or data transfer system that couples the various components within

the device. A system bus can include any one or combination of different bus structures, such as a memory bus or memory controller, a peripheral bus, a universal serial bus, and/or a processor or local bus that utilizes any of a variety of bus architectures.

[0069] Computing system 700 also includes computer-readable media 714, such as one or more memory devices that enable persistent and/or non-transitory data storage (*i.e.*, in contrast to mere signal transmission), examples of which include random access memory (RAM), non-volatile memory (*e.g.*, any one or more of a read-only memory (ROM), flash memory, EPROM, EEPROM, etc.), and a disk storage device. A disk storage device may be implemented as any type of magnetic or optical storage device, such as a hard disk drive, a recordable and/or rewriteable compact disc (CD), any type of a digital versatile disc (DVD), and the like. Computing system 700 can also include a mass storage media device 716.

[0070] Computer-readable media 714 provides data storage mechanisms to store device data 704, as well as various device applications 718 and any other types of information and/or data related to operational aspects of computing system 700. For example, an operating system 720 can be maintained as a computer application with computer-readable media 714 and executed on processors 710. Device applications 718 may include a device manager, such as any form of a control application, software application, signal-processing and control module, code that is native to a particular device, a hardware abstraction layer for a particular device, and so on.

[0071] Device applications 718 also include any system components, engines, or managers to implement triggering a journal entry from a wearable device. In this example, device applications 718 include gesture manager 112 and journal service 114.

Conclusion

[0072] Although embodiments of techniques using, and objects including, triggering a journal entry from a wearable device have been described in language specific to features and/or methods, it is to be understood that the subject of the appended claims is not necessarily limited to the specific features or methods described. Rather, the specific features and methods are disclosed as example implementations of triggering a journal entry from a wearable device.

CLAIMS

What is claimed is:

1. A system comprising:

a gesture manager configured to receive touch data from a wearable device worn by a user, and determine that the touch data corresponds to a request to create a journal entry; and

a journal service configured to:

determine a current location of the user and a current time in response to the touch data corresponding to the request to create the journal entry;

collect contextually-relevant information associated with at least one of the current location of the user and the current time; and

create a journal entry that includes the current location of the user, the current time, and the contextually-relevant information.

2. The system of claim 1, wherein the journal service is further configured to determine a current activity of the user, and create the journal entry to include the current activity of the user.

3. The system of claim 1 or 2, wherein the wearable device is an interactive garment worn by the user, the interactive garment including an interactive textile integrated with interactive garment and configured to detect touch-input from the user.

4. The system of any preceding claim, wherein the contextually-relevant information comprises one or more of images of the current location, friends of the user nearby the current location, nearby places of interest, or social media data associated with the current location.

5. The system of any preceding claim, further comprising a journal application implemented at a computing device that is wirelessly coupled to the wearable device, the journal application configured to display the journal entry in a journal user interface on a display of the computing device.

6. The system of claim 5, wherein the journal application is further configured to enable the user to edit the journal entry or add information to the journal entry via the journal user interface.

7. The system of claim 5 or 6, wherein the journal application is further configured to enable the user to perform an action associated with the journal entry via the journal user interface.

8. The system of any of claims 5 to 7, wherein the journal service is implemented at the computing device that is wirelessly coupled to the wearable device.

9. The system of any of claims 5 to 7, wherein the journal service is at least partially implemented at a server that is remote from the computing device.

10. An interactive garment comprising:

a network interface;

an interactive textile comprising a grid of conductive thread woven into the interactive garment to form a capacitive touch sensor; and

a textile controller coupled to the capacitive touch sensor, the textile controller configured to:

detect touch-input to the capacitive touch sensor when a user wearing the interactive garment touches the capacitive touch sensor;

process the touch-input to provide touch data; and

communicate the touch data to a computing device, via the network interface, to cause the computing device to create a journal entry that includes a current location of the user and a current time.

11. The interactive garment as recited in claim 10, further comprising an output device configured to provide audio, visual, or haptic feedback, and wherein the textile controller is further configured to control the output device to provide the feedback when touch-input to create the journal entry is detected.

12. The interactive garment as recited in claim 11, wherein the output device comprises one or more of a light source, a speaker, a display, or a vibration component.

13. The interactive garment as recited in claim 11, wherein the capacitive touch sensor and the output device are positioned on a sleeve of interactive garment.

14. The system of any of claims 1 to 9 wherein the wearable device is provided by the interactive garment of any of claims 10 to 13.

15. A computer-implemented method comprising:

receiving, at a computing device, touch data from a wearable device worn by a user;

determining, at the computing device, that the touch data corresponds to a request to create a journal entry;

in response to determining that the touch data corresponds to the request to create the journal entry, determining a current location of the user and a current time;

collecting contextually-relevant information associated with at least one of the current location of the user and the current time; and

creating a journal entry that includes the current location of the user, the current time, and the contextually-relevant information.

16. The computer-implemented method of claim 15, wherein the collecting the contextually-relevant information further comprises:

communicating a query to a remote service to collect the contextually-relevant information, the query including at least the current location of the user and the current time; and

receiving, from the remote service, the contextually-relevant information.

17. The computer-implemented method of claim 15 or 16, wherein the touch data is received from an interactive garment worn by the user, the interactive garment including an interactive textile woven into the interactive garment and configured to detect touch-input from the user.

18. The computer-implemented method of any of claims 15 to 17, wherein the contextually-relevant information comprises one or more of images of the current location, friends of the user nearby the current location, nearby places of interest, or social media data associated with the current location.

19. The computer-implemented method of any of claims 15 to 18, further comprising causing display of the journal entry in a journal user interface, the journal user interface enabling the user to classify, edit, or add information to the journal entry.

20. The computer-implemented method of any of claims 15 to 19, wherein the user-input comprises a single gesture to the wearable device, and wherein the journal entry is created without additional user-input other than the single gesture to the wearable device.

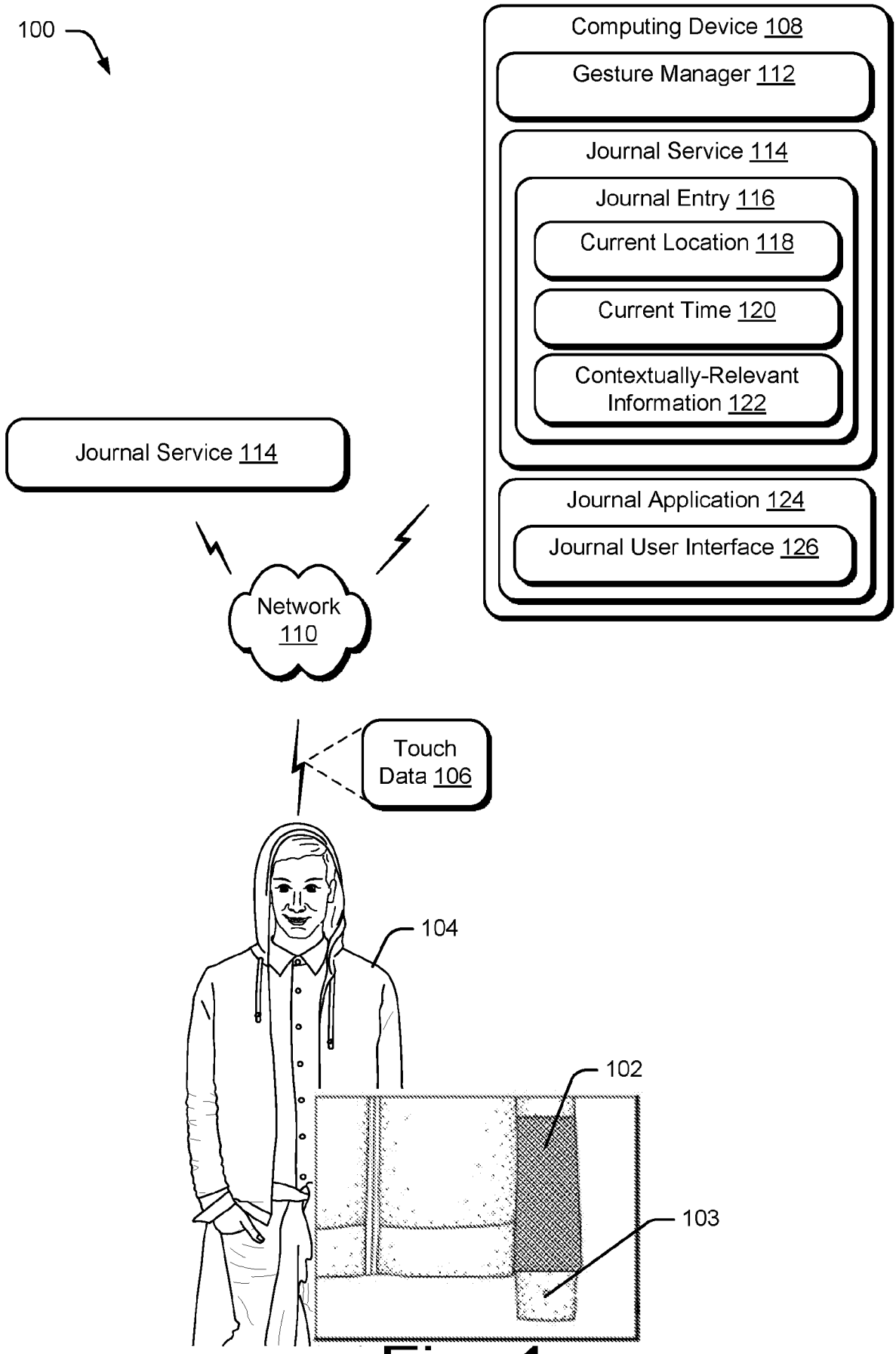
100
Computing Device 108
Gesture Manager 112
Journal Service 114
Journal Entry 116
Current Location 118
Current Time 120
Contextually-Relevant Information 122
Journal Application 124
Journal User Interface 126
Journal Service 114
Network 110
Touch Data 106
104
102
103

Fig. 1

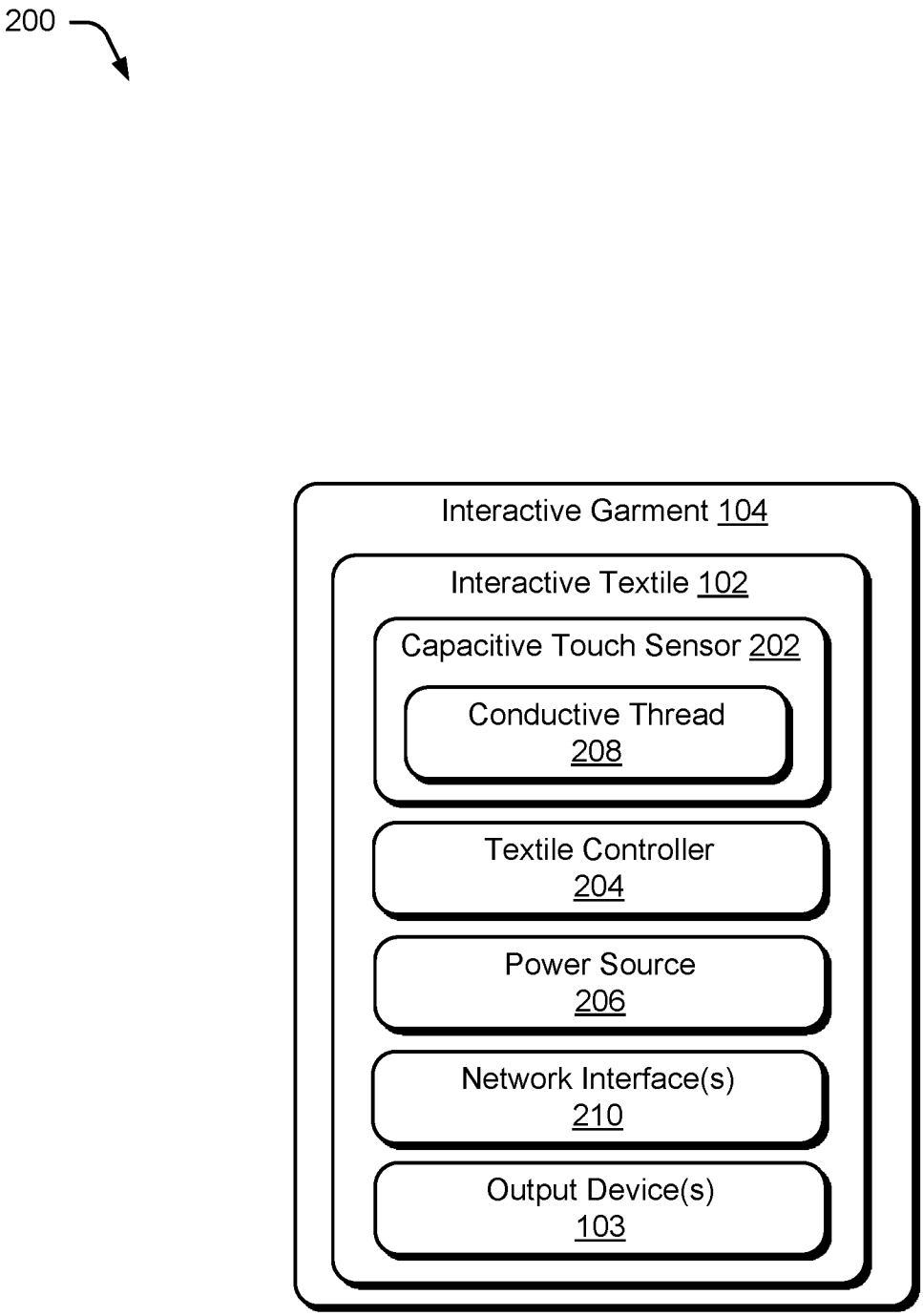
200
Interactive Garment 104
Interactive Textile 102
Capacitive Touch Sensor 202
Conductive Thread 208
Textile Controller 204
Power Source 206
Network Interface(s) 210
Output Device(s) 103

Fig. 2

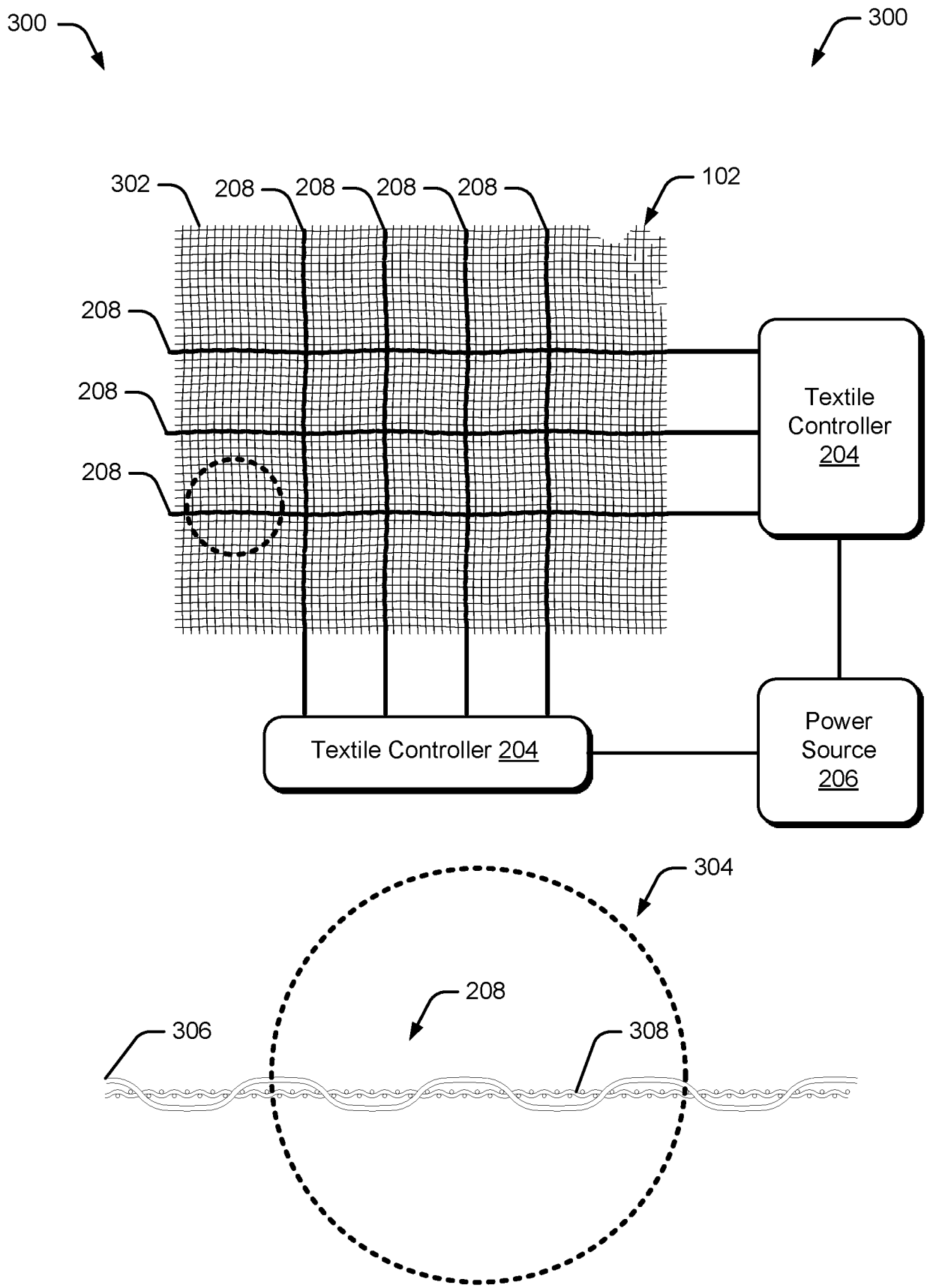
300
300
302
208
208
208
208
102
208
208
208
Textile Controller 204
Textile Controller 204
Power Source 206
304
208
306
308

Fig. 3

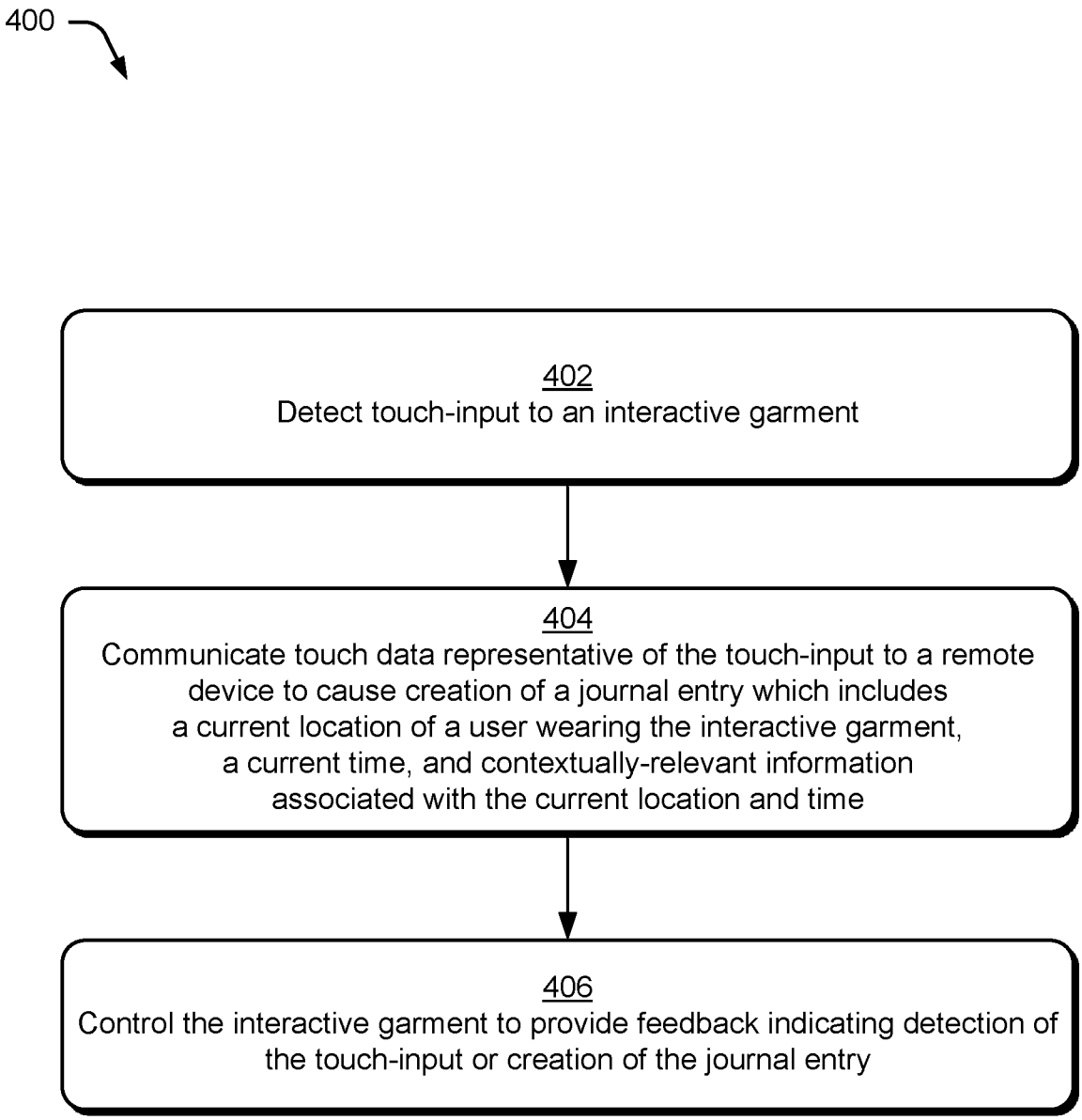
400
402
Detect touch-input to an interactive garment
404
Communicate touch data representative of the touch-input to a remote device to cause creation of a journal entry which includes a current location of a user wearing the interactive garment, a current time, and contextually-relevant information associated with the current location and time
406
Control the interactive garment to provide feedback indicating detection of the touch-input or creation of the journal entry

Fig. 4

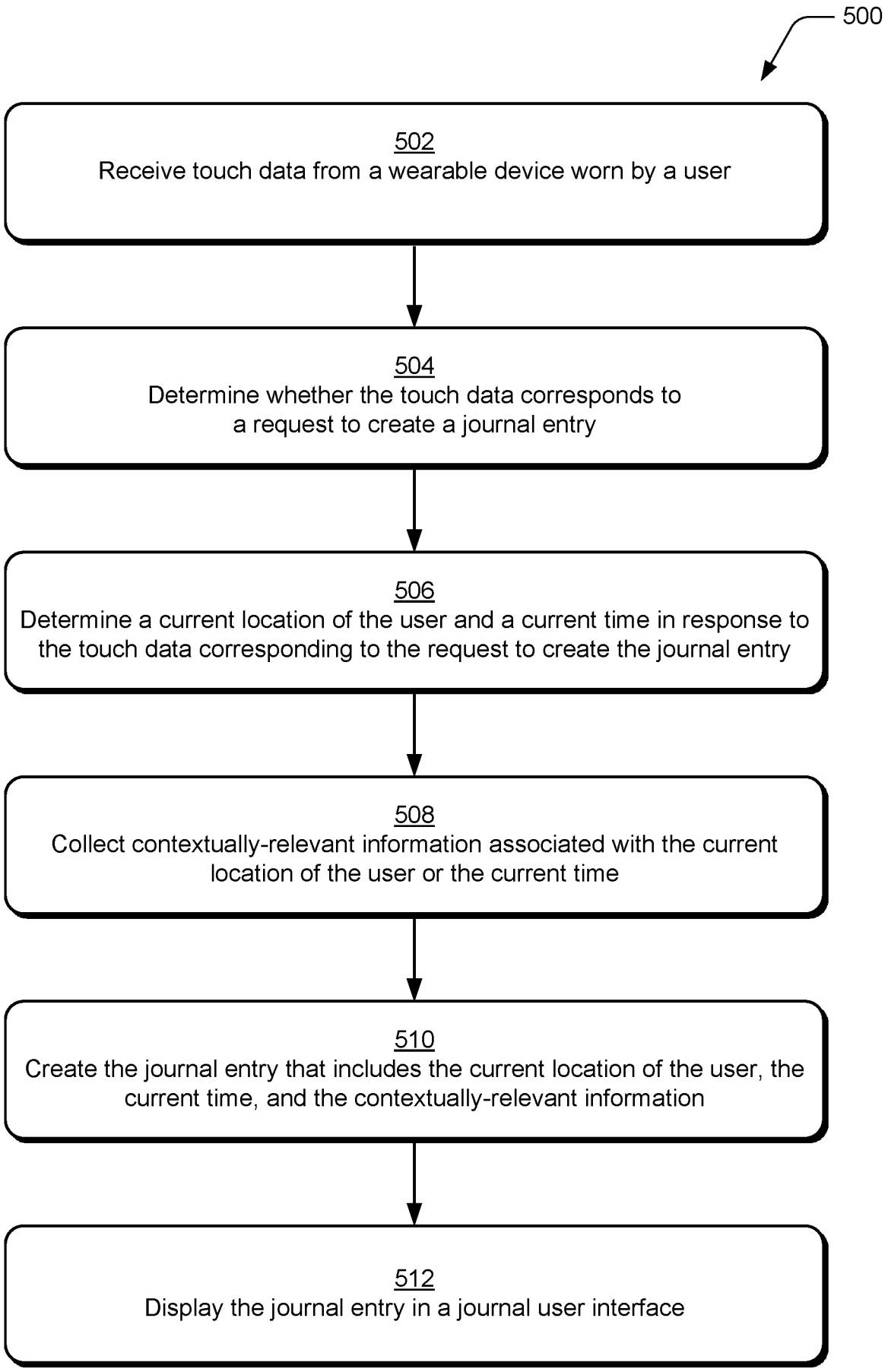
500
502
Receive touch data from a wearable device worn by a user
504
Determine whether the touch data corresponds to a request to create a journal entry
506
Determine a current location of the user and a current time in response to the touch data corresponding to the request to create the journal entry
508
Collect contextually-relevant information associated with the current location of the user or the current time
510
Create the journal entry that includes the current location of the user, the current time, and the contextually-relevant information
512
Display the journal entry in a journal user interface

Fig. 5

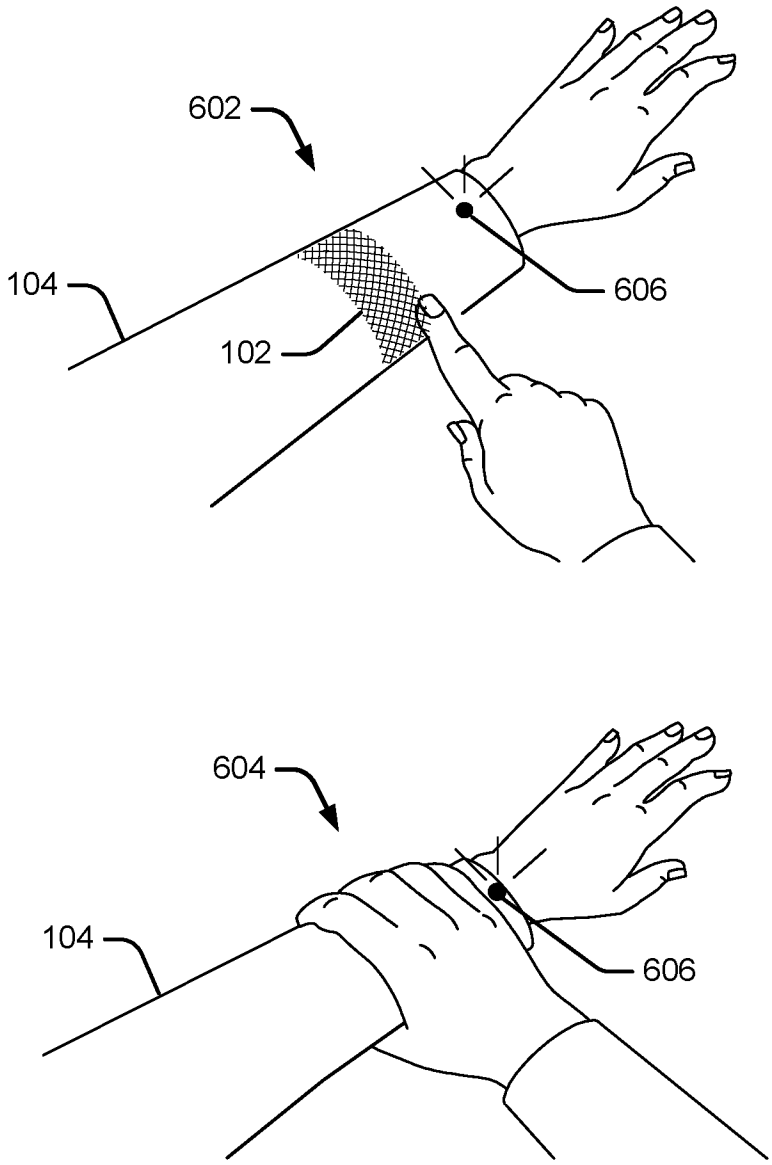

Fig. 6A

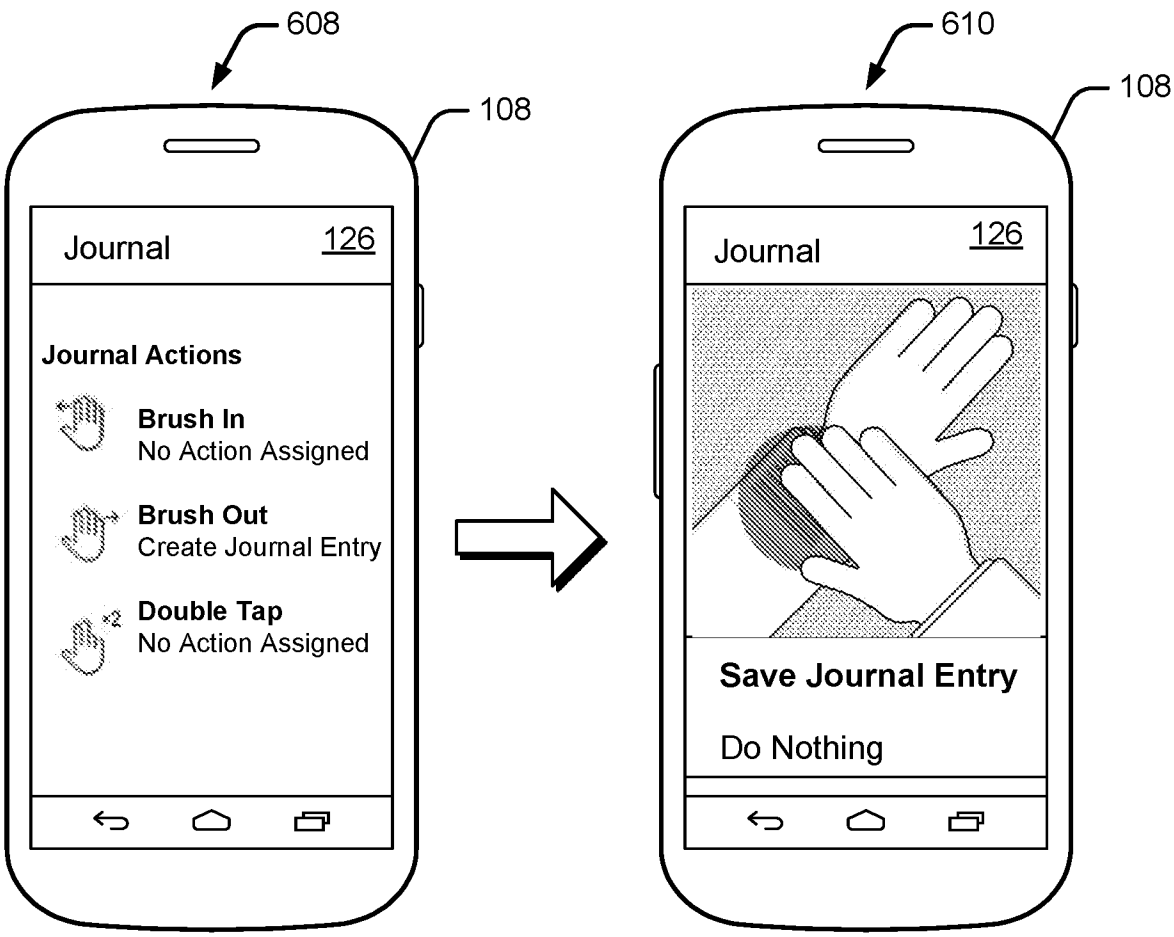
608
108
Journal
126
Journal Actions
Brush In
No Action Assigned
Brush Out
Create Journal Entry
Double Tap
No Action Assigned
610
108
Journal
126
Save Journal Entry
Do Nothing

Fig. 6B

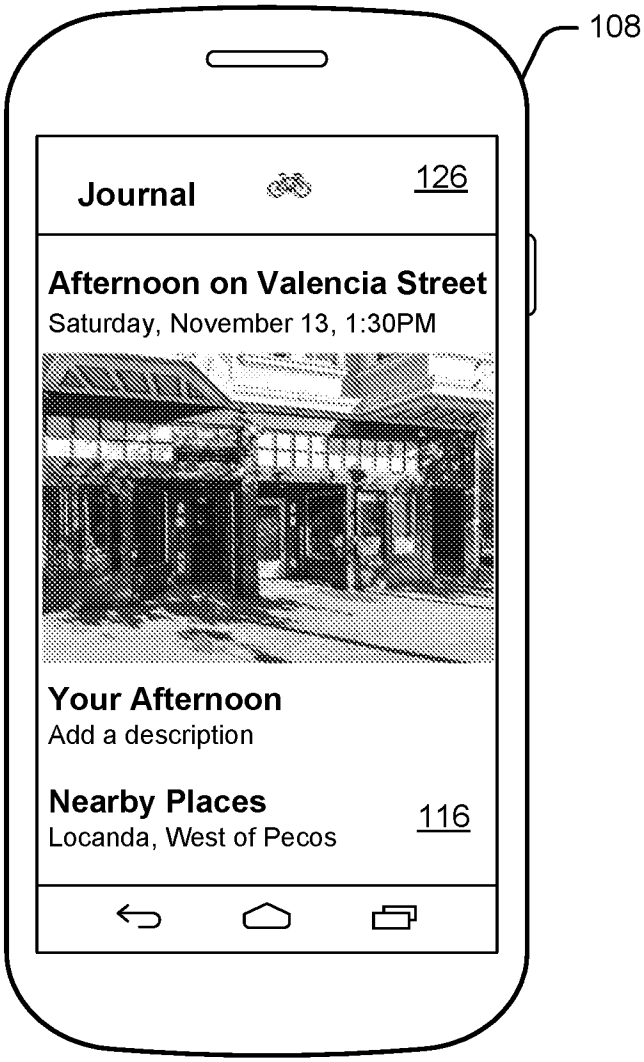
108
Journal
126
Afternoon on Valencia Street
Saturday, November 13, 1:30PM
Your Afternoon
Add a description
Nearby Places
116
Locanda, West of Pecos

Fig. 6C

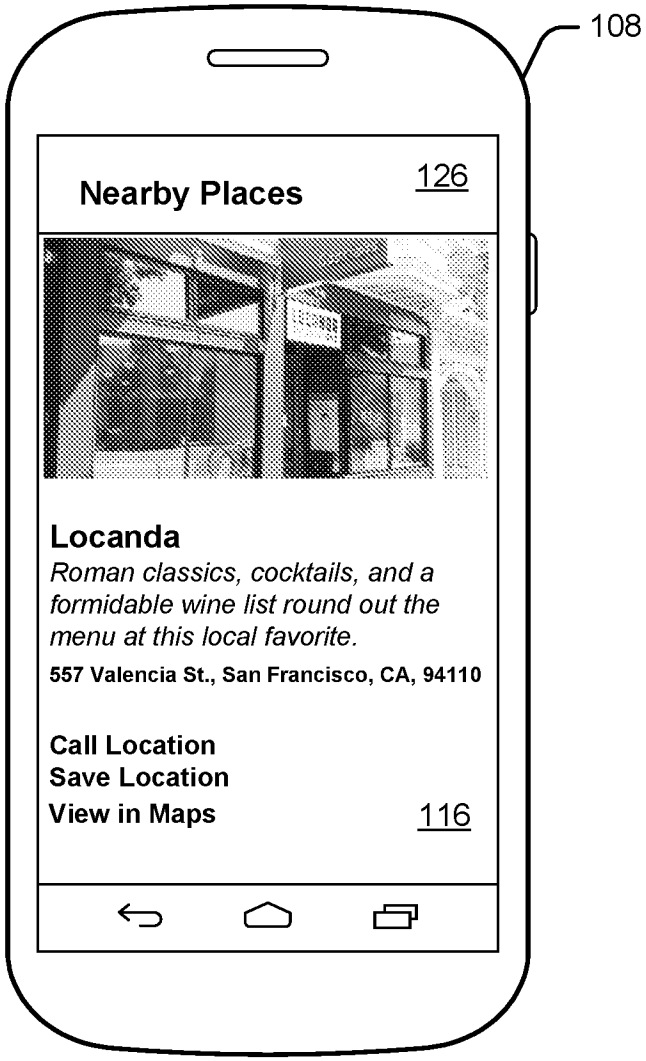
108
Nearby Places
126
Locanda
Roman classics, cocktails, and a formidable wine list round out the menu at this local favorite.
557 Valencia St., San Francisco, CA, 94110
Call Location
Save Location
View in Maps
116

Fig. 6D

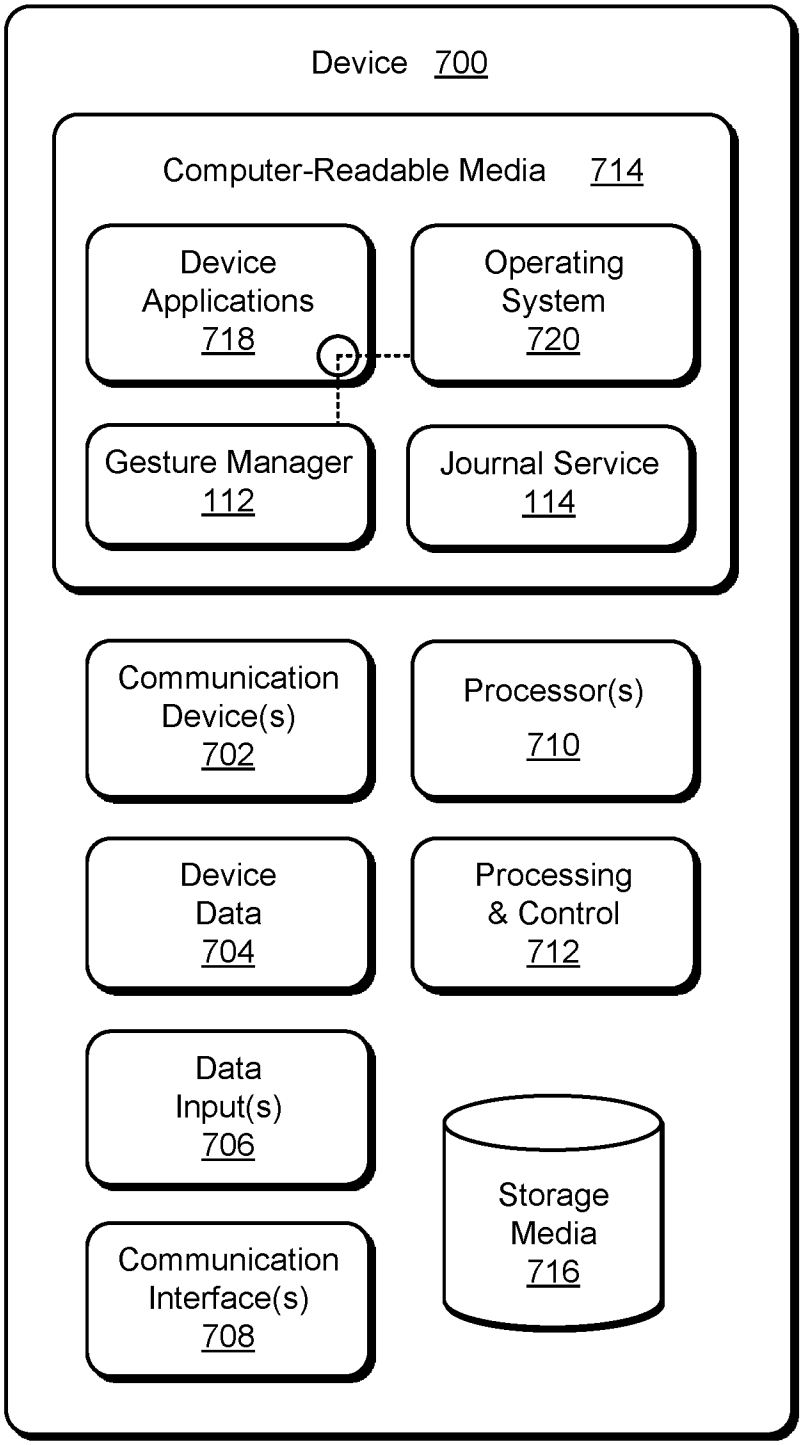
Device 700
Computer-Readable Media 714
Device Applications 718
Operating System 720
Gesture Manager 112
Journal Service 114
Communication Device(s) 702
Processor(s) 710
Device Data 704
Processing & Control 712
Data Input(s) 706
Storage Media 716
Communication Interface(s) 708

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/023562

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F3/0488 G06F3/044 G06F15/02 G06F1/16 G06F3/01
G06Q10/10 H04M1/725
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)
G06F G06Q H04M

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.
Y	US 2016/048235 A1 (POUPYREV IVAN [US]) 18 February 2016 (2016-02-18) abstract paragraph [0003] paragraph [0023] - paragraph [0029]; figure 1 paragraph [0030] - paragraph [0038]; figure 2 paragraph [0055] - paragraph [0064]; figures 5A-5D paragraphs [0066], [0068]; figure 6 paragraph [0087] - paragraph [0092]; figure 9 paragraph [0093] - paragraph [0096]; figure 10 ----- -/--	1-20

[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
20 June 2017	27/06/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Valin, Steven

2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/023562

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/032447 A1 (BULTHUIS WILLEM [US]) 13 February 2003 (2003-02-13) abstract paragraph [0060]; figure 4 paragraph [0063]	1-20
Y	US 2014/070957 A1 (LONGINOTTI-BUITONI GIANLUIGI [US] ET AL) 13 March 2014 (2014-03-13) abstract paragraph [0087]; figures 1A, 1B User activity monitoring; paragraphs [0028], [0055], [0086], [0163] Social media integration; paragraphs [0028], [0148], [0149], [0159], [0160]; figure 2 Haptic feedback, AV output; paragraphs [0009], [0017], [0020], [0051], [0086], [0106], [0107] Lighting effects; paragraph [0091]	2,4,11, 12,18
Y	STEFAN SCHNEEGASS ET AL: "Towards a garment OS", WEARABLE COMPUTERS, ACM, 2 PENN PLAZA, SUITE 701 NEW YORK NY 10121-0701 USA, 13 September 2014 (2014-09-13), pages 261-266, XP058057574, DOI: 10.1145/2641248.2666718 ISBN: 978-1-4503-3048-0 the whole document	2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/023562

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2016048235 A1	18-02-2016	CN 106662943 A	10-05-2017
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