

SMART WEARABLE DEVICE

TECHNICAL FIELD

[001] The present disclosure described herein, in general, relates to a wearable device, and more particularly to a wearable device wirelessly connected to a portable handheld device.

BACKGROUND

[002] Portable handheld devices have become an extended and essential accessory. The handheld devices perform multitude of tasks like make and receive calls/messages, they update the user with location, maps, scheduling, news, etc.

[003] However, the portable handheld devices are required to be carried in hand all time. Keeping them away or in a bag may make you miss important notifications. Therefore carrying them in hand limits the usage. Specifically when working or driving, keeping the portable handheld device in hand poses a serious threat to safety of the user.

SUMMARY

[004] This summary is provided to introduce concepts related to systems and methods for a smart wearable device for communication and the concepts are 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 or limiting the scope of the claimed subject matter.

[005] In one implementation, a smart wearable device is disclosed. The smart wearable device may comprise of a housing having a strap sensor mounted on a bottom side of the housing. The housing may further house a printed circuit board (PCB) communicably connected to the strap sensor. Further, a wireless communication adaptor may be embedded on the PCB. A plurality of light emitting diodes (LED) may also be embedded on the printed circuit board. The smart wearable device may further comprise of at least one micro switch board. The micro switch board can be configured to select at least one task. The smart wearable device may further comprise of a cap sense switch.

[006] In another implementation of the present disclosure a method for smart wearable device communication is disclosed. The method comprises sensing, presence of the

smart wearable device on a user using a strap sensor. The method further comprises pairing of the smart wearable device with a portable handheld device. Further, establishing, a wireless mode communication between the smart wearable device and the portable handheld device. The method further comprises of selecting, at least one profile and performing at least one task based on the profile selected. The method may further comprise of receiving notification from the portable handheld device.

BRIEF DESCRIPTION OF THE DRAWINGS

[007] The detailed description is described with reference to the accompanying figures. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The same numbers are used throughout the drawings to refer like features and components.

[008] Figure 1 illustrates a functional diagram of a smart wearable device in accordance with an embodiment of the present disclosure.

[009] Figure 2 is a flowchart illustrating a method for smart wearable device communication, in accordance with an embodiment of the present disclosure.

[0010] Figure 3, illustrates a flow chart for Anti-theft mode profile, according to an embodiment.

[0011] Figure 4, illustrates a flow chart for Hands Free mode profile, according to an embodiment.

[0012] Figure 5, illustrates a flow chart for safety/accident mode profile, according to an embodiment.

[0013] Figure 6, illustrates a flow chart for find mode profile, according to an embodiment.

[0014] Figure 7, illustrates a flow chart for privacy mode profile, according to an embodiment.

DETAILED DESCRIPTION

[0015] A smart wearable device and method for communication thereof. According to an exemplary embodiment the smart wearable device may come in form of ring, bracelet, or watch. The smart wearable device can be switched on when worn by a user. A strap sensor,

mounted in a housing of the smart wearable device, may sense presence of the smart wearable device on the user. The strap sensor may be communicably connected to a printed circuit board (PCB). The printed circuit board may be connected to a means for supplying power. A means for supplying power can be selected from a battery, a fuel cell or any other DC source. Further the means for supplying power can directly be mounted in the housing of the smart wearable device. In another embodiment a charging port can be provided to the charge the means for supplying power.

[0016] The smart wearable device may further comprise of a wireless adaptor embedded on the PCB. The wireless adaptor may enable the smart wearable device to communicate wirelessly with a portable handheld device. The wireless may use standard protocols of wireless communication like Bluetooth™ or WiFi, or Near Field Communication (NFC) or zigbee. The wireless adaptor may enable the smart wearable device to receive notification, or send notification to the portable handheld device. Communication channel used by the wireless adaptor to establish the communication between smart wearable device and portable handheld device, may allow the smart wearable device to select at least one profile from a set of pre-defined profiles or perform at least one task. The selection can be made by pressing at least one micro switch, wherein the selection is confirmed and highlighted using a light emitting diode. The pre-defined profile may refer to a privacy mode, an alert mode, a find mode, anti-theft mode or accident mode.

[0017] In another embodiment a hands free profile may also be defined, wherein the smart wearable device may be configured to capture gesture by the user and in turn activate the speaker on the portable handheld device to answer and incoming call or outgoing call. In another embodiment the hands free profile can be activated by pressing the at least one button, wherein the at least one button can be configured to activate the speaker on the portable handheld device.

[0018] Further, according to the present disclosure the smart wearable device may perform the at least one task. The at least one task may refer to selection of a pre-defined profile, responding to an incoming communication, detecting the portable handheld device, or sending an alert communication.

[0019] According to another implementation of the present disclosure the smart wearable device may comprise of a three (3) axis gyroscope sensor. The 3-axis G sensor may

be used to determine orientation of the smart wearable device. The smart wearable device may also comprise a means for creating vibration to alert the user of incoming notification or incoming communication.

[0020] In another implementation a method for smart wearable device communication is disclosed. The method may be divided into two phases, a first phase and a second phase. First phase may refer to first time or initial setup of the smart wearable device and the second phase may refer to regular use of the smart wearable device.

First Phase/Initial Set-up

[0021] In an exemplary implementation, a smart wearable device is switched “ON” when worn by a user. Upon switching on the smart wearable device, the smart wearable device may detect for a portable handheld device in vicinity. Upon detecting the portable handheld device, the smart wearable device may pair/connect with the portable handheld device using a unique identification number or PIN number. Upon completion of the pairing of the devices, a link may be generated and displayed on a screen of the portable handheld device. The link may refer to a path to download an application. The application may enable the user to configure and customize setting on the smart wearable device. After clicking and installing the application on the portable handheld device, the user can you existing or create new login credentials. The application may be required to be installed only once upon first use and only if the previous application is deleted.

[0022] The user of the smart wearable device may need to configure the application. The application may enable the user to create profiles. The profile can be pre-defined based user specification. For e.g. the user may create a privacy profile, wherein the user can select few contacts from a contact book on the portable handheld device or applications from whom incoming communication are to be notified to the user.

[0023] The user may need to configure at least a privacy mode, an alert mode, a find mode, anti-theft mode and accident mode. Each of the modes can further be mapped to a specific task and at least one light emitting diode (LED) from a plurality of light emitting diodes (LED).

[0024] In an exemplary embodiment the privacy mode can be mapped to at least one task, wherein the at least one task can be selected from receiving notification from pre-selected contacts and application, or disable notification. The pre-selected contacts or the

application in the privacy mode can be customized by selecting the privacy mode profile on the portable handheld device.

[0025] In another exemplary embodiment the alert mode can be mapped to at least one task enabling the smart wearable device to create a vibration based alert or LED based alert or combination thereof for an incoming notification. The incoming notification is from the portable handheld device to the smart wearable device.

[0026] In yet another exemplary embodiment the find mode can be mapped to at least one task enabling the smart wearable device to locate the portable handheld device. The portable handheld device can be located by sending a signal to the portable handheld device play a sound.

[0027] In yet another exemplary embodiment the anti-theft mode can be mapped to at least one task wherein an alarm is sounded in the portable handheld device, when the handheld device moves away from a threshold distance of the smart wearable device.

[0028] In yet another exemplary embodiment the accident mode can be mapped to at least one task wherein a distress signal along with location is sent to a select set of recipient using communication channel of the portable handheld device. The location can be determined using global positioning sensor of the portable handheld device. The set of recipient can be selected from the contact book.

Second Phase/ Regular Use

[0029] Upon setting up the application and the smart wearable device, the user can select the at least one profile through the smart wearable device.

[0030] Referring now to **Figure 1**, illustrates a functional diagram of a smart wearable device **100** in accordance with an embodiment of the present disclosure. The functional diagram, discloses a housing **102**. The housing **102**, may further comprise of a front panel cover (FPC) **104** and a printed circuit board (PCB) **106**. The housing **102**, further consist of a bottom side and a top side. A strap sensor **120**, may be mounted in the housing **102**. The strap sensor can further be communicably connected to the PCB **106**. The strap sensor **120** may be configured to detect or sense the presence of the smart wearable device on a user. Upon sensing or detecting the presence of the smart wearable device on the user, the strap sensor **120** may communicate an “ON” signal to the PCB **106**. In an exemplary embodiment the strap sensor **120**, maybe a magnetic based sensor.

[0031] Upon receiving the “ON” signal and automatically switching on the smart wearable device, the PCB **106** through a wireless adaptor **116** detects and pairs, with a portable handheld device. The wireless adaptor **116**, may use standard wireless protocols to establish a communication channel with the portable handheld device. After pairing and establishing communication between the smart wearable device and portable handheld device, a notification can be sent to the user. The notification can be in a form of illumination by a plurality light emitting diodes (LED’s) **108** or in a form of vibration using a vibrator **122** or combination of both LED’s **108** and vibrator **122**.

[0032] In another exemplary embodiment the plurality of LED’s **108** or vibrator **122** may further be configured to notify the user of any other communication based on at least one task selected. The at least one task may be selected using a micro switch **110**. The at least one task may be selected from a pre-defined profile, responding to an incoming communication, detecting the portable handheld device, or sending an alert communication. The micro switch **110** can be positioned on FPC **104** and embedded on the PCB **106**. The micro switch **110** further may be supported by a cap sense switch **112**. The cap sense switch **112** may be configured to illuminate the plurality of LED’s **108** or support the micro switch **110** in case they are spring based.

[0033] The housing **106** may further comprise a means for supplying power **114** to the smart wearable device. The means for supplying power **114** can be selected from a battery, a fuel cell or any other DC source. In another embodiment a charging port can be provided to the charge the means for supplying power.

[0034] In another embodiment a 3 axis gyroscope sensor **118** may be embedded on the PCB **106**.

[0035] Referring now to **Figure 2**, a flowchart illustrating a method for smart wearable device communication, in accordance with an embodiment of the present disclosure.

[0036] The order in which the method **200** is described is not intended to be construed as a limitation, and any number of the described method blocks can be combined in any order to implement the method **200** or alternate methods. Additionally, individual blocks maybe deleted from the method **200** without departing from the spirit and scope of the disclosure described herein.

[0037] At block **202**, the smart wearable device senses the presence of the device on a user. A strap sensor can be used to sense the presence. At block **204**, the smart wearable device pairs with a portable handheld device. The pairing can be complete using a unique identification number or PIN number. At block **206**, a wireless connection is established between the smart wearable device and the portable handheld device. The wireless connection can be established using a wireless adaptor configured to use standard protocols. At block **208**, at least one profile is selected from pre-defined profiles. The profiles can be selected using light emitting diode embedded on a PCB. At block **210**, at least one task is performed. The at least one task are mapped with at least one profiles selected. At block **212**, notifications are received on the smart wearable device. The notifications are based on the profile selected.

[0038] Figure 3, illustrates a flow chart for Anti-theft mode profile, according to an embodiment. The process starts at 302 when a smart wearable device is connected to a mobile phone or portable handheld device. The smart wearable device ping the mobile phone and determines whether the mobile phone is within the threshold distance in step 304. If the mobile phone is within the limit the process is re-directed to step 304. However, if a fail signal is received the smart wearable device waits until it times out at the step 306. If time outs and a ping is received back from mobile phone process flows back to 304. In case ping fails after time out the mobile start to ring at step 308. If action is taken at step 310, the process flows back to 304 or else 308.

[0039] Figure 4, illustrates a flow chart for Hands Free mode profile, according to an embodiment. The process starts at 402 when a smart wearable device is connected to a mobile phone or portable handheld device. A call is received at the mobile phone at step 404. A user is notified about the call on the smart wearable device. The user can then press a micro switch at step 406. The speaker on the mobile is then activated at step 408. Upon completion of the call, call can be disconnected at step 410.

[0040] Figure 5, illustrates a flow chart for safety/accident mode profile, according to an embodiment. The process starts at 502 when a smart wearable device is connected to a mobile phone or portable handheld device. If a user of the smart wearable device is in distress the situation can is sensed by the device at step 504. The smart wearable device determines

the GPS co-ordinates of the user using the GPS sensor of the mobile phone at step 506. A message is sent to at least 5 contacts pre-defined by the user along with GPS co-ordinates at step 508. At the step 510 the recipients can click on the message to determine the exact distance between them and the user.

[0041] Figure 6, illustrates a flow chart for find mode profile, according to an embodiment. The process starts at 602 when a smart wearable device is connected to a mobile phone or portable handheld device. A user can press a micro switch on the smart wearable device to locate the mobile phone at step 604. Once the user presses the micro switch the mobile phones sounds ring at step 606.

[0042] Figure 7, illustrates a flow chart for privacy mode profile, according to an embodiment. The process starts at 702 when a smart wearable device is connected to a mobile phone or portable handheld device. The user selects a privacy profile at step 704. When a call is received at the mobile phone, the call is compared to list of allowable notification at step 706. If they are permitted a LED based alert or vibration based alert or combination of thereof is given to user at step 708.

Claims

1. A smart wearable device comprising:
 - a housing;
 - a strap sensor mounted on a bottom side of the housing;
 - a printed circuit board, housed in the housing, communicably connected to the strap sensor;
 - a wireless communication adaptor embedded on the printed circuit board;
 - a plurality of light emitting diode embedded on the printed circuit board;
 - at least one micro switch configured for selecting at least one task from a list comprising:
 - locating a portable handheld device,
 - selecting an anti-theft mode,
 - selecting an accident mode, and
 - sending a distress signal; and
 - a switch using capacitive sensing,
 - wherein the switch using capacitive sensing is configured to illuminate the plurality of light emitting diode,
 - wherein the smart wearable device is configured to provide all the tasks in the list for selection,
 - wherein the smart wearable device is configured for receiving notification from the portable handheld device after selection of the at least one task.
2. The smart wearable device of claim 1, wherein the smart wearable device is further communicably connected to a portable handheld device, wherein the smart wearable device and the portable handheld device communicate wirelessly using the wireless communication adaptor.
3. The smart wearable device of claim 1, wherein the smart wearable device further comprises a means for creating vibration in the smart wearable device.
4. The smart wearable device of claim 1, wherein the smart wearable device further comprises a means for supplying power.
5. The smart wearable device of claim 1, wherein the smart wearable device further comprises a three axis gyroscope sensor embedded on the printed circuit board, configured to determine orientation of the smart wearable device.

6. A method for smart wearable device communication, the method comprising:
 - sensing presence of the smart wearable device on a user using a strap sensor;
 - pairing of the smart wearable device with a portable handheld device;
 - establishing a wireless mode communication between the smart wearable device and the portable handheld device;
 - providing a list of profiles for selection;
 - selecting at least one profile from the list and performing at least one task based on the profile selected; and
 - receiving notification from the portable handheld device after selection of the at least one profile,wherein the list comprises an alert mode, a find mode, anti-theft mode and an accident mode.
7. The method of claim 6, wherein the list further comprises a privacy mode.
8. The method of claim 7, wherein selecting the privacy mode, enables the smart wearable device to perform the at least one task selected from receive notification from pre-selected contacts and application, or disable notification.
9. The method of claim 6, wherein selecting the alert mode, enables the smart wearable device to perform the at least one task creating a vibration based alert or LED based alert or combination thereof for an incoming notification.
10. The method of claim 6, wherein selecting the find mode, enables the smart wearable device to perform the at least one task of locating the portable handheld device.
11. The method of claim 10, wherein the portable handheld device is located, by sending a signal to the portable handheld device to play a sound.
12. The method of claim 6, wherein selecting the anti-theft mode, enables the smart wearable device to perform the at least one task of sounding an alarm in the portable handheld device, when the handheld device move away from a threshold distance of the smart wearable device.
13. The method of claim 6, wherein selecting the accident mode, enables the smart wearable device to perform the at least one task of sending a distress signal along with location to a predefined set of recipients using communication channel of the portable handheld device.
14. The method of claim 13, wherein the location is captured from, global position sensor of, the portable handheld device.