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(54) **ELECTRONIC BIO MONITORING PATCH**

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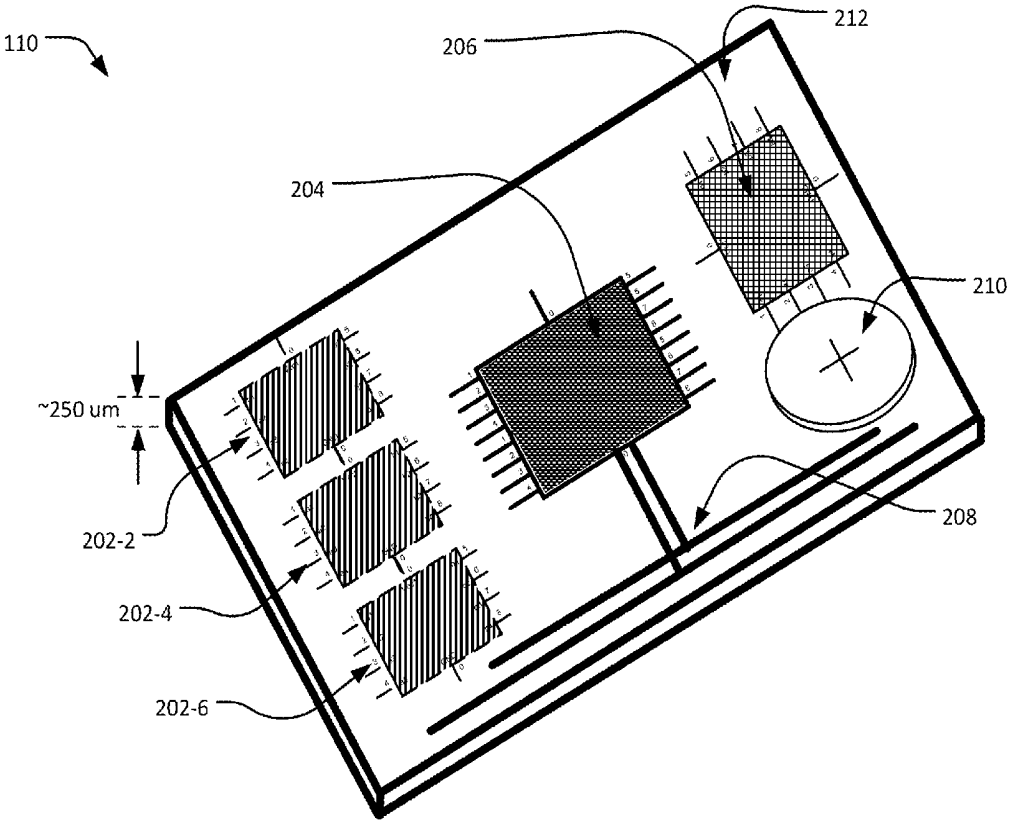
(57) **ABSTRACT**

Described herein are technologies related to a wireless electronic vital sign monitoring of a person. More particularly, detecting vital signs and processing of the detected vital signs using a bio monitoring patch.



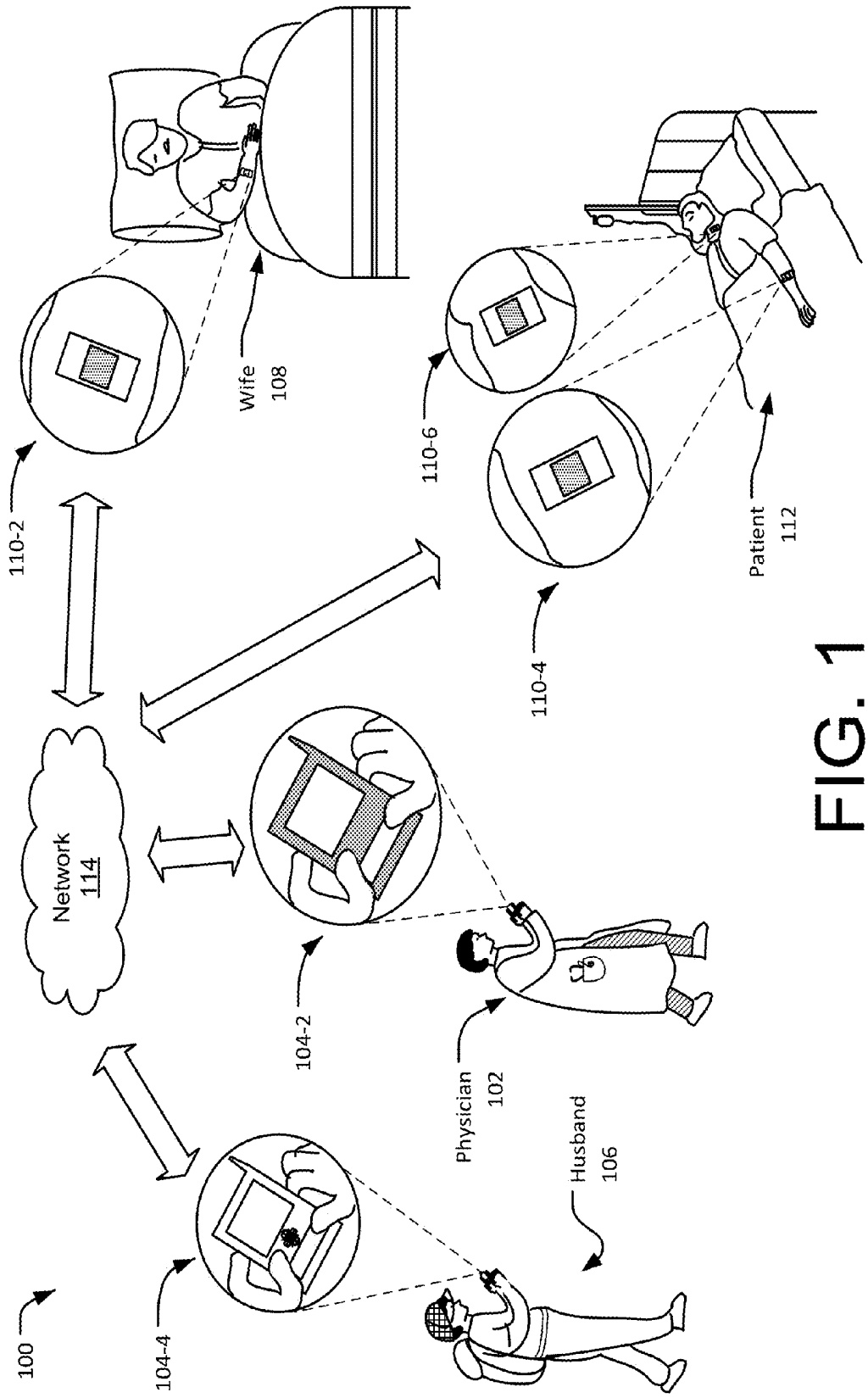

100
Network
114
110-2
110-4
110-6
104-2
104-4
Wife
108
Physician
102
Husband
106
Patient
112

FIG. 1

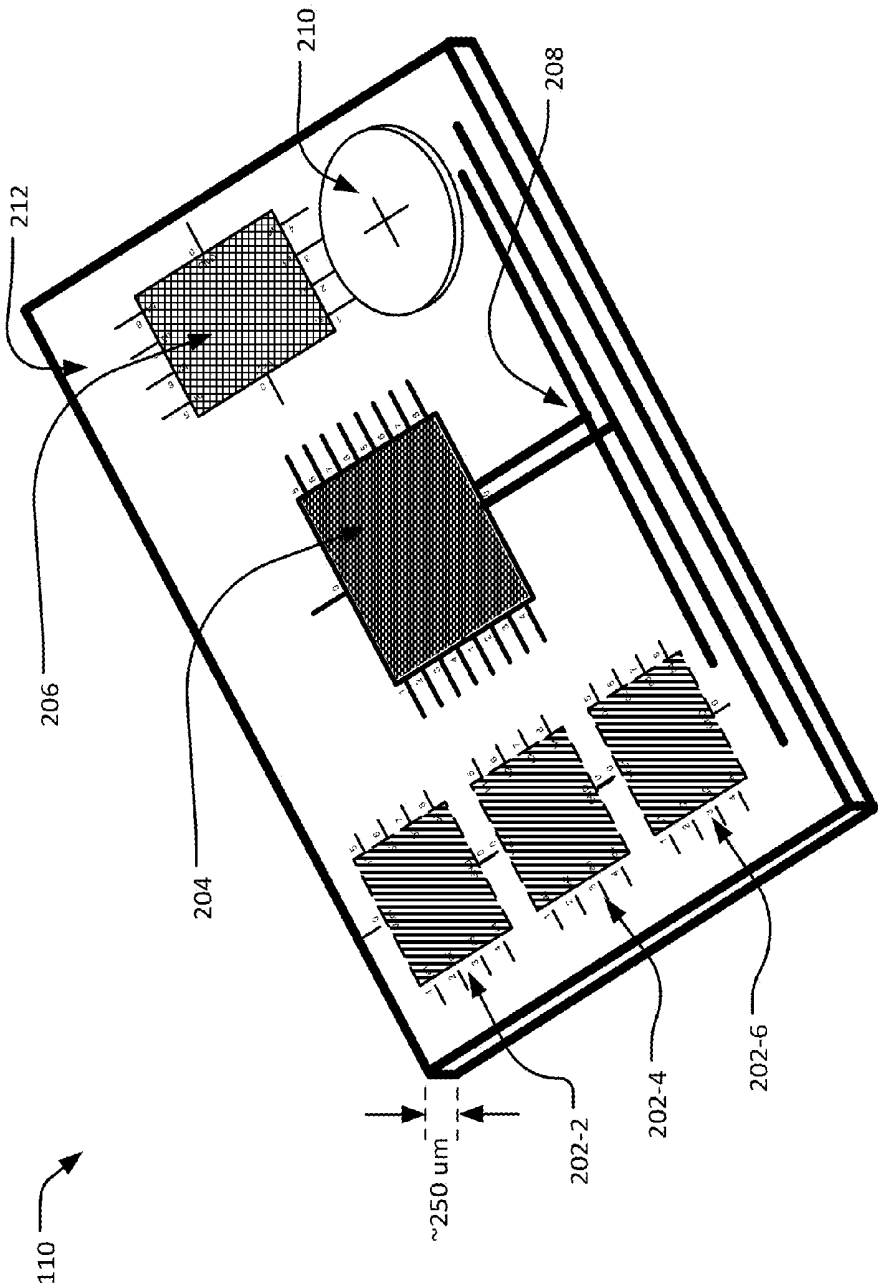


FIG. 2

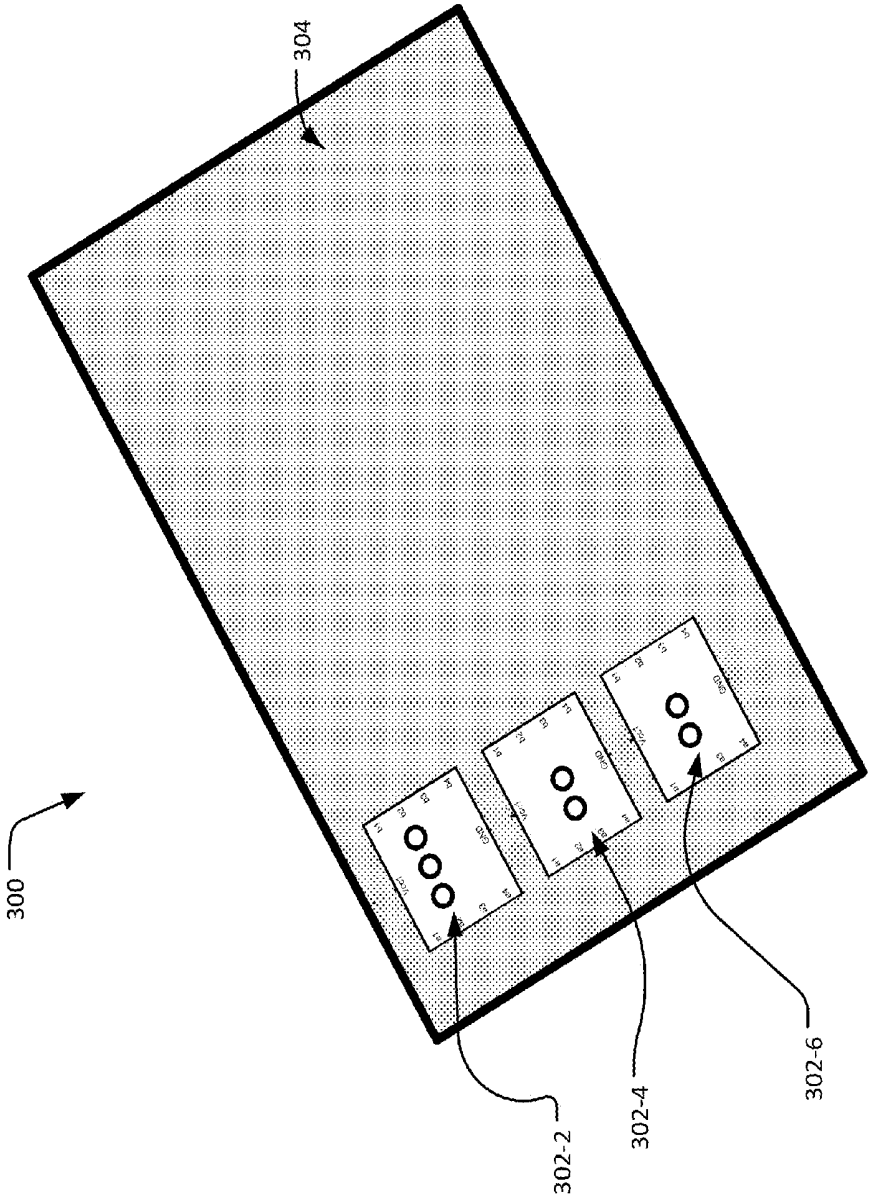


FIG. 3

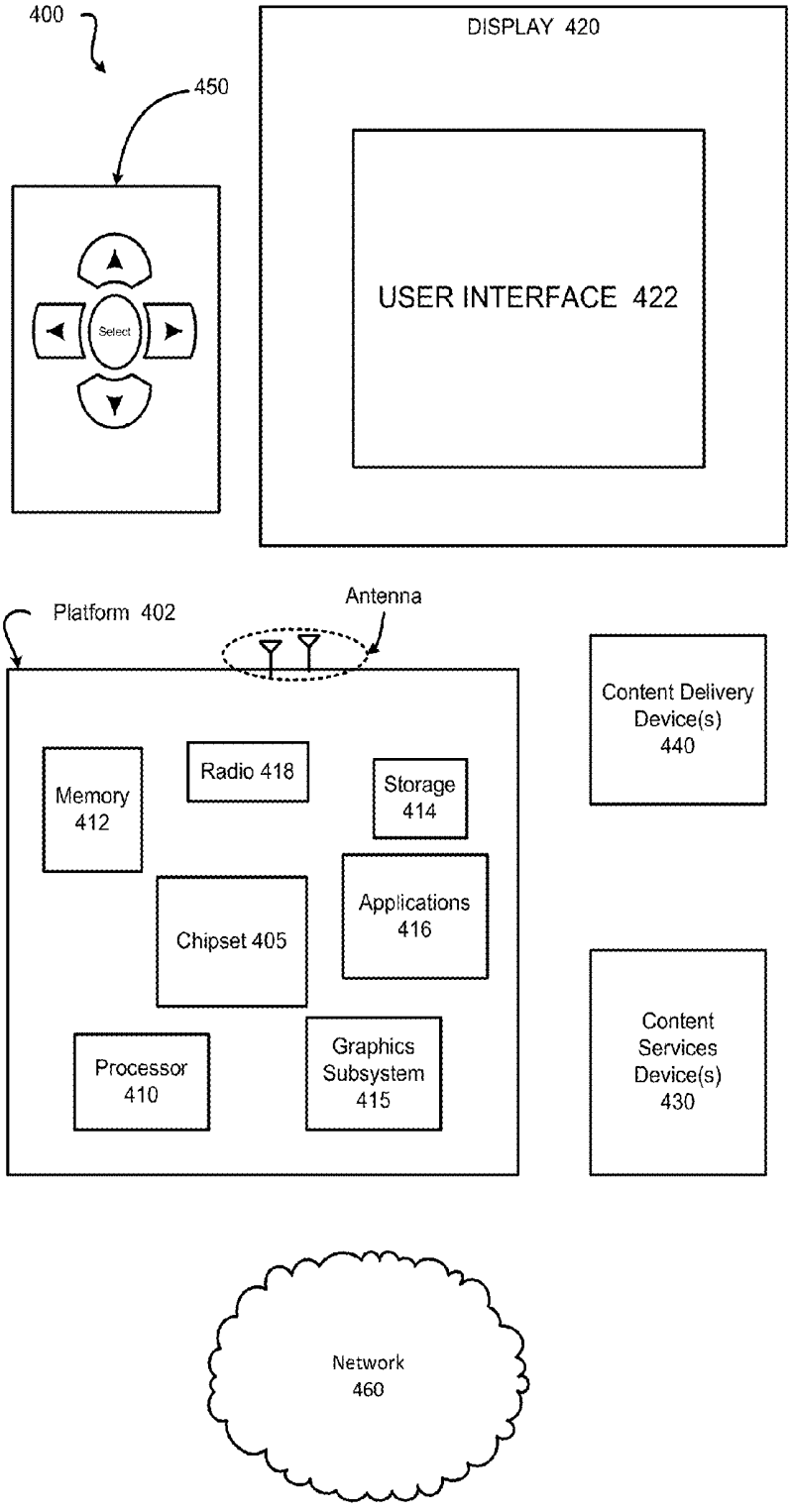

400
450
Select
DISPLAY 420
USER INTERFACE 422
Platform 402
Antenna
Memory 412
Radio 418
Storage 414
Applications 416
Chipset 405
Processor 410
Graphics Subsystem 415
Content Delivery Device(s) 440
Content Services Device(s) 430
Network 460

FIG. 4

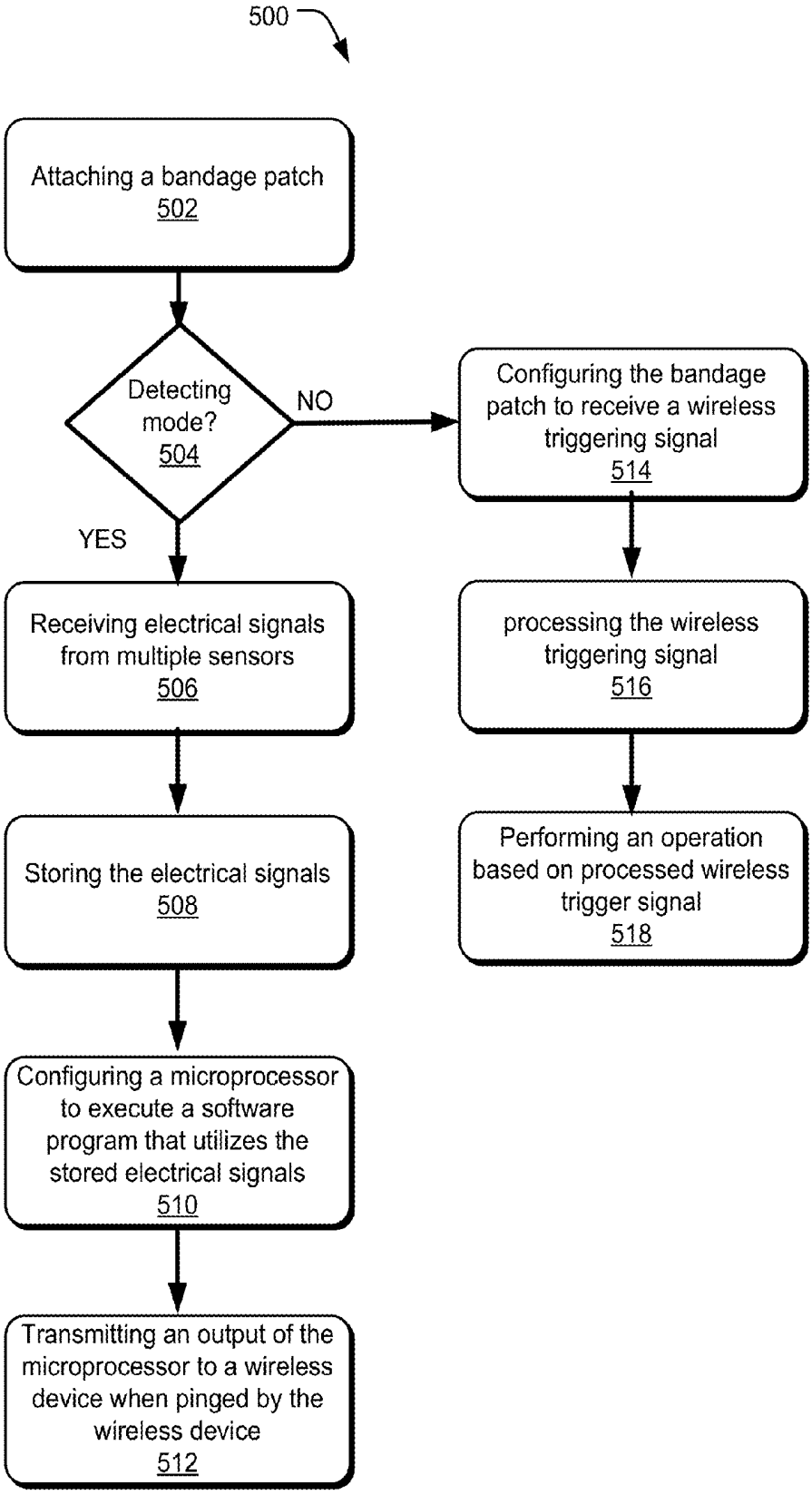

500
Attaching a bandage patch
502
Detecting mode?
504
NO
YES
Configuring the bandage patch to receive a wireless triggering signal
514
Receiving electrical signals from multiple sensors
506
processing the wireless triggering signal
516
Storing the electrical signals
508
Performing an operation based on processed wireless trigger signal
518
Configuring a microprocessor to execute a software program that utilizes the stored electrical signals
510
Transmitting an output of the microprocessor to a wireless device when pinged by the wireless device
512

FIG. 5

ELECTRONIC BIO MONITORING PATCH

BACKGROUND

[0001] A conventional vital signal monitoring of a person typically requires a strap or a garment to hold a device to a specific area where the vital sign is to be measured. For example, when measuring blood pressure of the person, blood pressure equipment is strapped to an arm of the person. Due to the bulkiness and relatively large size of electronic circuitry associated with this portable medical device (i.e., blood pressure equipment), the electronic circuitry is typically external to the equipment itself. For example, processing circuits are implemented through an external computer that is attached to the blood pressure equipment.

[0002] Furthermore, the conventional portable medical devices are often utilized in multiple patients such that, a careful sterilization of the medical devices is observed every time that the portable medical device is used. Additionally, the weight and geometry of rigid containers enclosing the medical devices are not well-suited for flexibility during treatment of the person in an operating room where a number of medical equipment may be attached to the body of the person.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIG. **1** illustrates an example scenario that shows different situations of utilizing a wearable bio monitoring patch to transmit data (e.g., health information) to a wireless device.

[0004] FIG. **2** illustrates an example top view of a system that implements a bio monitoring patch.

[0005] FIG. **3** illustrates an example underside view of a bio monitoring patch.

[0006] FIG. **4** illustrates an example system of a wireless device in accordance with present disclosure.

[0007] FIG. **5** illustrates an example flowchart of an example method of implementing electronic vital sign monitoring system on chip (SOC) device.

DETAILED DESCRIPTION

[0008] Described herein is a technology for a wireless electronic vital sign monitoring of a person. More particularly, a method of detecting vital signs and processing of the detected vital signs is described.

[0009] For example, a bio monitoring patch—at detecting mode—is configured to detect and store vital signs such as body temperature, heartbeat rate, and the like of a patient. In this example, a system on a chip (SOC) microprocessor in the bio monitoring patch is configured to utilize the stored vital signs as variables to a pre-configured program such as, generating a summary of the patient's vital signs in the last twelve hours. In another example, the SOC microprocessor may be configured to control periods of detection by multiple stimulators, stimulator contacts, or sensors in the bio monitoring patch. Such stimulators can deliver medicine, electrical, optical, radio frequency (RF) or mechanical energy to the body.

[0010] As an example of current implementations herein, the bio monitoring patch may be configured to generate electrical pulses to stimulate muscles of the patient. In this example, the (SOC) microprocessor may be configured to control the generation of the electrical pulses that are used to treat or strengthen the muscles of the patient. In another example, the SOC microprocessor may be configured to control other machines that may be utilized in giving health care to the patient. For example, if an intravenous fluid (IV) is injected through a machine, then the SOC microprocessor may be configured to control wirelessly the machine based on detected vital signs of the patient.

[0011] FIG. **1** illustrates a scenario **100** that shows different situations of utilizing a wearable bio monitoring patch to transmit data (e.g., health information) to a wireless device. As shown, scenario **100** depicts a physician **102** holding a wireless device **104-2**, a husband **106** holding a wireless device **104-4**, a wife **108** wearing a bio monitoring patch **110-2**, and a patient **112** wearing bio monitoring patches **110-4** and **110-6**. Furthermore, scenario **100** shows a network **114** that is utilized to establish wire/wireless communications between the wireless device **104** and the bio monitoring patch **106**.

[0012] Scenario **100** depicts an example implementation of technology described herein. For example, the husband **106** is a person who works away from home and would like to check on health information updates of his wife (i.e., wife **108**) who is currently at home and lying in bed. In this example, the husband **106** utilizes his wireless device **104-4** that is configured to receive the health information from the bio monitoring patch **110-2** that the wife **108** is wearing.

[0013] As an example of present implementation, the bio monitoring patch **110-2** above may be configured to detect vital signs such as, a current body temperature, blood pressure, blood sugar, and other body measurements of the wife **108**. In this example, the bio monitoring patch **110-2** may be configured to process the detected vital signs and transmit a summary of the vital signs or body measurements to the wireless device **104-4** of the husband **106**. In another example, the wife **108** may be at a grocery store and the husband **106** may check the health information updates of the wife **108** through the wireless device **104-4**. In other implementations, stimulators, stimulator contacts, or sensors in the bio monitoring patch **110-2** may deliver medicine, electrical, optical, radio frequency (RF) or mechanical energy to the body.

[0014] In another example, the physician **102** is a medical doctor who is physically outside of a hospital (not shown) where the patient **112** is currently confined. In this example, the patient **112** is under the care of the physician **102** and the physician **102** utilizes his wireless device **104-2** to get health information updates of the patient **112**. Similar to the discussion above, the bio monitoring patches **110-4** and **110-6**, which the patient **112** are wearing, may be configured to make body measurements or detect vital signs on the patient **112** and transmit the body measurements or detected vital signs to the wireless device **104-2**.

[0015] With continuing reference to FIG. **1**, the bio monitoring patch **110** includes a wireless epidermal electronic sensor system that contains a miniaturized microprocessor with multiple stimulators, stimulator contacts, or sensors in the bio monitoring patch. Such stimulators can deliver medicine, electrical, optical, radio frequency (RF) or mechanical energy to the body. For example, such stimulators or sensors may detect the vital signs such as different body measurements on a person (e.g., wife **108** or patient **112**). For example, the bio monitoring patch **110** is made of semiconductor materials that include a memory in addition to the miniaturized stimulators, stimulator contacts, or sensors, microprocessor, and the like. In this example, the bio monitoring patch **110** may perform external (i.e., epidermal) body

measurements, or the bio monitoring patch **110** may be embedded inside the body of the person (i.e., wife **108** or the patient **112**) to be monitored. In another example, the bio monitoring patch **110** may be used to generate electrical pulses to stimulate muscles of the wife **108** or the patient **112**.

[0016] As an example of the present implementation, a radio signal (not shown) such as a cellular signal, a wireless fidelity (Wi-Fi) signal, and the like, may be used by the physician **102** or the husband **106** to access the bio monitoring patch **110**. For example, the physician **102** may receive the remote health information updates through the cellular signal by receiving a text messaging. In this example, the wireless device **104-2** may receive the text messaging through the cellular signal and not through the network **114**.

[0017] As depicted, the wireless device **104** may include, but not limited to, a mobile phone, a cellular phone, a smartphone, a personal digital assistant, a tablet computer, a netbook, a notebook computer, a laptop computer, a multimedia playback device, a digital music player, a digital video player, a navigational device, a digital camera, and the like.

[0018] FIG. **2** illustrates an example top view of system **200** that implements the bio monitoring patch **110**. System **200** shows multiple stimulators, stimulator contacts, or sensors **202**, system on chip (SOC) microcontroller **204**, a non-volatile memory (NVM) **206**, an antenna **208**, a battery **210** and a semiconductor material **212**.

[0019] As an example of present implementation herein, the multiple stimulators, stimulator contacts, or sensors **202**, at detecting mode, may be an epidermal body sensor that detects vital signs such as various body measurements. Typically, the body measurement is performed from outermost layer of a skin of the person being tested. The epidermal body sensor may detect body temperature, skin dryness, blood pressure, blood sugar, heartbeat rate, muscle activity, neurological activity, brain waves, and other physiological signals.

[0020] Upon detection of the vital signs above, the multiple stimulators, stimulator contacts, or sensors **202** may be configured to store the detected vital signs to the NVM **206**. For example, the body temperature and the heart rate of the patient **112** for the last twelve hours are separately stored at the NVM **206**. In this example, the SOC microcontroller **204** may be configured to interact with the multiple stimulators, stimulator contacts, or sensors **202**. For example, the SOC microcontroller **204** may allow the multiple stimulators, stimulator contacts, or sensors **202** to detect the vital signals at a specific period of time only (e.g., every two hours in one day).

[0021] As an example of current implementations herein, the SOC microcontroller **204** may be configured to allow the multiple stimulators, stimulator contacts, or sensors **202-2**, **202-4** and **202-6** to combine its separate sensors to detect the vital signs of the patient **112**. For example, the SOC microcontroller **204** may be configured generate a summary that contains the measured body temperature for the last eight hours; heart rate average at the last ten hours; and muscle activity for the last twelve hours. In this example, the SOC microcontroller **204** may perform a configured calculation to generate the summary based on the vital sign measurements in the last twelve hours.

[0022] In another example, the SOC microcontroller **204**, if not in detecting mode, may be configured to generate electrical pulses to stimulate muscles of the patient **112**. For example, the physician **102** may prescribe staggered stimulation of different muscles of the patient **112** who is recovering from paralyzed state. In this example, the SOC microcontroller **204** may be configured or programmed to enable the multiple stimulators, stimulator contacts, or sensors **202** to generate the electrical signals at different body parts (e.g., neck, hand, foot) of the patient **112**.

[0023] As an example of current implementations herein, the SOC microcontroller **204**, if not in detecting mode, may be further configured to control other machine/s that may be used to give health care to the patient **112**. For example, if injection of intravenous fluids (IV) is made through a machine with an electronic control, then the SOC microcontroller **204** may be configured to control the machine based upon the summary generated by the multiple stimulators, stimulator contacts, or sensors **202**.

[0024] With continuing reference to FIG. **2**, the antenna **208** may be a Wi-Fi antenna, an NFC antenna, a Bluetooth™ antenna or an RF antenna. For example, if there is no available network or cellular signals in a particular area where that patient **112** is located, then the physician **102** may utilize the NFC feature of the wireless device **104**. In this example, the wireless device **104** is tapped into the bio monitoring patch **110** to establish wireless communications.

[0025] As another example of the antenna **208** implementation, the bio monitoring patch **110** may wirelessly communicate with the wireless device **104** using the Wi-Fi signal. For example, the antenna **208** is configured to operate at Wi-Fi signal frequency (e.g., 2.4 GHz band). In this example, the wireless device **104** may connect to the bio monitoring patch **110** through the Wi-Fi signal.

[0026] As shown, the bio monitoring patch **110** may be configured to be thin (e.g., less than two hundred fifty micrometers) and flexible so that the SOC microcontroller **204**, the NVM **206** and the other components in the SOC device may not be damaged when bended.

[0027] FIG. **3** illustrates an example underside view of the system **300** to implement the bio monitoring patch **110**. The underside view shows contact points **302**, and adhesive **304**.

[0028] As an example of present implementation, contact point **302-2** is configured to detect body temperature of the patient **112**. In this example, the contact point **302-2** may include a transducer that converts body heat into an electrical energy. The electrical energy may then be used to generate digital measurements of the body heat of the patient **112**.

[0029] In another example, contact point **302-4** detects heartbeat rate of the patient **112**. In this example, the heartbeat rate may generate an acoustical wave that is transformed into electrical signals by the contact points **302-4**. The detected heartbeat rate and the body temperature as detected by the contact point **302-2** may be integrated together in producing a summary of the vital signs of the patient **112**. For example, the SOC microcontroller **204** is configured to transmit an emergency signal if a certain combination of the detected heartbeat rate and body temperature is reached. In this example, the SOC microcontroller **204** may be configured to process both electrical signals that may be generated by the contact points **302-2** and **302-4**.

[0030] In another example, contact point **302-6** is configured to detect amount of oxygen from the body of the patient **112**. In this example, the SOC microcontroller **204** may be configured to relate the detected amount of oxygen with previous samples stored in the NVM **206**. For example, an average of the detected amount of oxygen within last twenty four hours on the body of the patient **112** when combined with the current body temperature and heartbeat rate may signify to

the physician **102** to prescribe oral medication to the patient **112**. In this example, the SOC microcontroller **204** may transmit the information to the wireless device **104** of the physician **102**.

[0031] As an example of current implementations herein, the contact point **302** may be utilized to deliver current or electrical pulses to the patient **112**. For example, the electrical pulses are delivered through the skin of the patient **112**. Since the skin is conductive by nature, the electrical pulses will reach and stimulate the muscles of the patient **112**. The stimulation of the muscles is usually utilized to create strength in the muscles of the patient **112**. In other implementations, contact point **302** may deliver medicine, optical, RF or mechanical energy.

[0032] With continuing reference to FIG. **3**, the adhesive **304** may contain skin adhesive hydrogels to attach firmly the bio monitoring patch **110** to the patient **112**. For example, the skin adhesive hydrogels may allow the contact points **302** to detect freely the vital signs of the patient **112** due to a very thin nature of the adhesive **304** that is utilized to attach the bio monitoring patch **110**.

[0033] FIG. **4** illustrates an example system **400** of the wireless device **104** in accordance with present disclosure. In various implementations, system **400** may be a media system although system **400** is not limited to this context. For example, system **400** may be incorporated into a personal computer (PC), laptop computer, ultra-laptop computer, tablet, touch pad, portable computer, handheld computer, palmtop computer, personal digital assistant (PDA), cellular telephone, combination cellular telephone/PDA, television, smart device (e.g., smart phone, smart tablet or smart television), mobile internet device (MID), messaging device, data communication device, and so forth.

[0034] In various implementations, system **400** includes a platform **402** coupled to a display **420**. Platform **402** may receive content from a content device such as content services device(s) **430** or content delivery device(s) **440** or other similar content sources. A navigation controller **450** including one or more navigation features may be used to interact with, for example, platform **402** and/or display **420**. Each of these components is described in greater detail below.

[0035] In various implementations, platform **402** may include any combination of a chipset **405**, processor **410**, memory **412**, storage **414**, graphics subsystem **415**, applications **416** and/or radio **418**. Chipset **405** may provide intercommunication among processor **410**, memory **412**, storage **414**, graphics subsystem **415**, applications **416** and/or radio **418**. For example, chipset **405** may include a storage adapter (not depicted) capable of providing intercommunication with storage **414**.

[0036] Processor **410** may be implemented as a Complex Instruction Set Computer (CISC) or Reduced Instruction Set Computer (RISC) processors, x86 instruction set compatible processors, multi-core, or any other microprocessor or central processing unit (CPU). In various implementations, processor **410** may be dual-core processor(s), dual-core mobile processor(s), and so forth that is coupled to the PIC as discussed in FIG. **2** above.

[0037] As an example of current implementations herein, the processor **410** is configured to control operations of the bandage patch **110**. For example, the processor **410** is configured to include a software program that utilizes data from the NVM **206**. In this example, the processing in the SOC microprocessor **204** is controlled by the software program in the processor **410** of the wireless device **104**. To this end, the wireless device **104**—in passive mode—is merely a wireless extension of the wireless device **104** through the network **114** or other radio signal. For example, the functions discussed in FIGS. **2** and **3** with regard to the SOC microprocessor **204** are directly performed by the physician **102** through the wireless device **104-2**. For example, the detected vital signs in the last twenty four hours from the patient **112** are received and utilized as variables execution of the software program in the processor **410** of the system **400**.

[0038] Memory **412** may be implemented as a volatile memory device such as, but not limited to, a Random Access Memory (RAM), Dynamic Random Access Memory (DRAM), or Static RAM (SRAM).

[0039] Storage **414** may be implemented as a non-volatile storage device such as, but not limited to, a magnetic disk drive, optical disk drive, tape drive, an internal storage device, an attached storage device, flash memory, battery backed-up SDRAM (synchronous DRAM), and/or a network accessible storage device. In various implementations, storage **414** may include technology to increase the storage performance enhanced protection for valuable digital media when multiple hard drives are included, for example.

[0040] As an example of current implementations herein, the storage **414** stores received data from the bandage patch **110**. In this example, the data is utilized by the processor **410** to direct and control operations of the bandage patch **110**.

[0041] Graphics subsystem **415** may perform processing of images such as still or video for display. Graphics subsystem **415** may be a graphics processing unit (GPU) or a visual processing unit (VPU), for example. An analog or digital interface may be used to communicatively couple graphics subsystem **415** and display **420**. For example, the interface may be any of a High-Definition Multimedia Interface, DisplayPort, wireless HDMI, and/or wireless HD compliant techniques. Graphics subsystem **415** may be integrated into processor **410** or chipset **405**. In some implementations, graphics subsystem **415** may be a stand-alone card communicatively coupled to chipset **405**.

[0042] The graphics and/or video processing techniques described herein may be implemented in various hardware architectures. For example, graphics and/or video functionality may be integrated within a chipset. Alternatively, a discrete graphics and/or video processor may be used. As still another implementation, the graphics and/or video functions may be provided by a general purpose processor, including a multi-core processor. In further embodiments, the functions may be implemented in a consumer electronics device.

[0043] Radio **418** may include one or more radios capable of transmitting and receiving signals using various suitable wireless communications techniques. Such techniques may involve communications across one or more wireless networks. Example wireless networks include (but are not limited to) wireless local area networks (WLANs), wireless personal area networks (WPANs), wireless metropolitan area network (WMANs), cellular networks, and satellite networks. In communicating across such networks, radio **418** may operate in accordance with one or more applicable standards in any version.

[0044] In various implementations, display **420** may include any television type monitor or display. Display **420** may include, for example, a computer display screen, touch screen display, video monitor, television-like device, and/or a television. Display **420** may be digital and/or analog. In vari-

ous implementations, display **420** may be a holographic display. Also, display **420** may be a transparent surface that may receive a visual projection. Such projections may convey various forms of information, images, and/or objects. For example, such projections may be a visual overlay for a mobile augmented reality (MAR) application. Under the control of one or more software applications **416**, platform **402** may display user interface **422** on display **420**.

[0045] In various implementations, content services device(s) **430** may be hosted by any national, international and/or independent service and thus accessible to platform **402** via the Internet, for example. Content services device(s) **430** may be coupled to platform **402** and/or to display **420**. Platform **402** and/or content services device(s) **430** may be coupled to a network **460** to communicate (e.g., send and/or receive) media information to and from network **460**. Content delivery device(s) **440** also may be coupled to platform **402** and/or to display **420**.

[0046] In various implementations, content services device(s) **430** may include a cable television box, personal computer, network, telephone, Internet enabled devices or appliance capable of delivering digital information and/or content, and any other similar device capable of unidirectionally or bidirectionally communicating content between content providers and platform **402** and/display **420**, via network **460** or directly. It will be appreciated that the content may be communicated unidirectionally and/or bidirectionally to and from any one of the components in system **400** and a content provider via network **460**. Examples of content may include any media information including, for example, video, music, medical and gaming information, and so forth.

[0047] Content services device(s) **430** may receive content such as cable television programming including media information, digital information, and/or other content. Examples of content providers may include any cable or satellite television or radio or Internet content providers. The provided examples are not meant to limit implementations in accordance with the present disclosure in any way.

[0048] In various implementations, platform **402** may receive control signals from navigation controller **450** having one or more navigation features. The navigation features of controller **450** may be used to interact with user interface **422**, for example. In embodiments, navigation controller **450** may be a pointing device that may be a computer hardware component (specifically, a human interface device) that allows a user to input spatial (e.g., continuous and multi-dimensional) data into a computer. Many systems such as graphical user interfaces (GUI), and televisions and monitors allow the user to control and provide data to the computer or television using physical gestures.

[0049] Movements of the navigation features of controller **450** may be replicated on a display (e.g., display **420**) by movements of a pointer, cursor, focus ring, or other visual indicators displayed on the display. For example, under the control of software applications **416**, the navigation features located on navigation controller **450** may be mapped to virtual navigation features displayed on user interface **422**, for example. In embodiments, controller **450** may not be a separate component but may be integrated into platform **402** and/or display **420**. The present disclosure, however, is not limited to the elements or in the context shown or described herein.

[0050] In various implementations, drivers (not shown) may include technology to enable users to instantly turn on and off platform **402** like a television with the touch of a button after initial boot-up, when enabled, for example. Program logic may allow platform **402** to stream content to media adaptors or other content services device(s) **430** or content delivery device(s) **440** even when the platform is turned "off." In addition, chipset **405** may include hardware and/or software support for 5.1 surround sound audio and/or high definition 7.1 surround sound audio, for example. Drivers may include a graphics driver for integrated graphics platforms. In embodiments, the graphics driver may comprise a peripheral component interconnect (PCI) Express graphics card.

[0051] In various implementations, any one or more of the components shown in system **400** may be integrated. For example, platform **402** and content services device(s) **430** may be integrated, or platform **402** and content delivery device(s) **440** may be integrated, or platform **402**, content services device(s) **430**, and content delivery device(s) **440** may be integrated, for example. In various embodiments, platform **402** and display **420** may be an integrated unit. Display **420** and content service device(s) **430** may be integrated, or display **420** and content delivery device(s) **440** may be integrated, for example. These examples are not meant to limit the present disclosure.

[0052] In various embodiments, system **400** may be implemented as a wireless system, a wired system, or a combination of both. When implemented as a wireless system, system **400** may include components and interfaces suitable for communicating over a wireless shared media, such as one or more antennas, transmitters, receivers, transceivers, amplifiers, filters, control logic, and so forth. An example of wireless shared media may include portions of a wireless spectrum, such as the RF spectrum and so forth. When implemented as a wired system, system **400** may include components and interfaces suitable for communicating over wired communications media, such as input/output (I/O) adapters, physical connectors to connect the I/O adapter with a corresponding wired communications medium, a network interface card (NIC), disc controller, video controller, audio controller, and the like. Examples of wired communications media may include a wire, cable, metal leads, printed circuit board (PCB), backplane, switch fabric, semiconductor material, twisted-pair wire, co-axial cable, fiber optics, and so forth.

[0053] Platform **402** may establish one or more logical or physical channels to communicate information. The information may include media information and control information. Media information may refer to any data representing content meant for a user. Examples of content may include, for example, data from a voice conversation, videoconference, streaming video, electronic mail ("email") message, voice mail message, alphanumeric symbols, graphics, image, video, text and so forth. Data from a voice conversation may be, for example, speech information, silence periods, background noise, comfort noise, tones and so forth. Control information may refer to any data representing commands, instructions or control words meant for an automated system. For example, control information may be used to route media information through a system, or instruct a node to process the media information in a predetermined manner. The embodiments, however, are not limited to the elements or in the context shown or described in FIG. **4**.

[0054] FIG. **5** shows an example process flowchart **500** illustrating an example method of implementing electronic vital sign monitoring SOC device. The order in which the method 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, or alternate method. Additionally, individual blocks may be deleted from the method without departing from the spirit and scope of the subject matter described herein. Furthermore, the method may be implemented in any suitable hardware, software, firmware, or a combination thereof, without departing from the scope of the invention.

[0055] At block **502**, attaching a bio monitoring patch to a person to be monitored is performed. For example, the bio monitoring patch (e.g., bio monitoring patch **110**) is attached to different body parts (e.g., hand, neck, head, etc.) of a person (e.g., patient **112**). In this example, the bio monitoring patch **110** is correspondingly placed at a location in the body parts according to purpose of utilizing the bio monitoring patch **110**. For example, if the bio monitoring patch **110** is utilized to detect heartbeat rate of the patient **112**, then the bio monitoring patch **110** is placed in a wrist, neck, or left chest where pulses can readily be received. In another example where body temperature of the patient **112** is also to be detected, another bio monitoring patch **110** is placed at an armpit of the patient **112**. In these examples, multiple bio monitoring patches **110** may be configured to act as a single bio monitoring patch **110**. For example, the detected and stored body temperate at the armpit is transmitted and stored at the bio monitoring patch **110** in the wrist of the patient **112**.

[0056] At block **504**, determining if the bio monitoring patch is used to detect vital signs of the person is performed. If YES, then following YES signal at block **506**, receiving electrical signals from multiple stimulators, stimulator contacts, or sensors is performed. For example, the bio monitoring patch **110** contains the stimulators, stimulator contacts, or sensors (e.g., **202**) that converts the body temperature of the patient **112** into electrical signals. In this example, the electrical signals may represent an electrical equivalence of measured body temperature of the patient **112**. In another example, the stimulators, stimulator contacts, or sensors **202** may be a transducer that converts acoustic signals from heart organ pulses to electrical signals. In this example, the electrical signals may represent beating frequency of the heart organ of the patient **112**. In these examples, the electrical signals are received by a SOC microprocessor (e.g., SOC microprocessor **204**).

[0057] At block **508**, storing the electrical signals is performed. For example, the electrical signals that are measured at different time intervals by each of the stimulators, stimulator contacts, or sensors **202** are stored in a storage device (e.g., NVM **206**). The stored electrical signals may be utilized as variables in implementing software program that may be configured at the SOC microprocessor **204**.

[0058] At block **510**, configuring the SOC microprocessor to execute the software program that utilizes the stored electrical signals is performed. For example, the SOC microprocessor **204** is configured to process and provide a summary of the stored electrical signals (e.g., body temperature) within the last twenty four hours. In this example, the SOC microprocessor **204** utilizes the stored electrical signals for patient's body temperature in the last twenty four hours as variables to generate the summary of the stored electrical signals.

[0059] In another example, the SOC microprocessor **204** is configured to process the stored electrical signals for both the body temperature and heartbeat rate in the last two hours and the SOC microprocessor **204** transmits an emergency signal if a certain threshold is reached. In this example, the SOC microprocessor **204** utilizes the body temperature and the heartbeat rate at the same time as variables to determine if the threshold is reached.

[0060] At block **512**, transmitting an output of the SOC microprocessor **204** is performed. For example, if the SOC microprocessor **204** is configured to execute the software program and an output produced by this implementation includes transmission of the emergency signal to a wireless device (e.g., wireless device **104**), then the bio monitoring patch **110** transmits the emergency signal through a network (e.g., network **114**) or other radio signals (e.g., cellular signal, Wi-Fi signal, Bluetooth™ signal, etc.).

[0061] In an implementation, the wireless device **104** is configured to integrate different electrical signals that may be received from the bio monitoring patches **110**. For example, if three separate bio monitoring patches **110** are attached to different body parts of the patient **112**, then the wireless device **104** may be configured to process and utilize the electrical signals from the three separate bio monitoring patches **110** as variables to software program that may be implemented in the wireless device **104**. In other words, the wireless device **104** may be configured to control operations of the bio monitoring patches **110** through the network **114** or other radio signals.

[0062] With reference to block **504**, if the bio monitoring patch **110** is not utilized as a detector of vital signs, then following the NO signal at block **514**, the bio monitoring patch **110** is configured to receive a wireless triggering signal. For example, the bio monitoring patch **110** receives the wireless triggering signal through its antenna (e.g., antenna **208**). In this example, the wireless triggering signal may include a request signal from the wireless device **104** to the bio monitoring patch **110** to perform a specific operation.

[0063] At block **516**, processing the wireless triggering signal is performed. For example the SOC microprocessor **204** is configured to process the received wireless triggering signal. In this example, the SOC microprocessor **204** may first determine authenticity of the wireless triggering signal and then utilizes the wireless triggering signal according to a configured program in the SOC microprocessor **204**. The configured program may, for example, include delivering electrical pulses to muscles of the patient **112**, changing frequency of detecting the vital signs, clearing memory contents at the NVM **206**, and the like.

[0064] At block **518**, performing an operation according to the processed wireless triggering signal is performed. For example, the operation may include the delivering of electrical pulses to the muscles of the patient **112**. In this example, the stimulators, stimulator contacts, or sensors **202** may be configured to deliver the electrical pulses to the muscles of the patient **112**.

What is claimed is:

1. A system on chip (SOC) device comprising:

at least one stimulator, stimulator contact, or sensor configured to convert a vital sign of a user into electrical signal;

memory that is configured to store the electrical signal;

a SOC microprocessor unit that is configured to process and utilize the stored electrical signal in implementing a configured software program in the SOC microprocessor, the configured software program combines the stored electrical signal to produce an output signal; and

an antenna that is configured to transmit the output signal of the SOC microprocessor.

2. The SOC device as recited in claim **1**, wherein the at least one stimulator, stimulator contact, or sensor measures the vital sign that includes one or more of the following: a heartbeat rate, blood sugar, oxygen, blood pressure, muscle activity, neurological activity, brain waves, or body temperature.

3. The SOC device as recited in claim **1**, wherein the at least one stimulator, stimulator contact, or sensor is configured to deliver electrical pulses.

4. The SOC device as recited in claim **1**, wherein the memory is a non-volatile memory (NVM) that stores the electrical signals that are measured at different time intervals, the stored electrical signals are utilized as variables in implementing the configured software program at the SOC microprocessor.

5. The SOC device as recited in claim **1**, wherein SOC microprocessor implements the software program that includes deriving a summary of the stored electrical signals, changing periods of vital signs detection, or clearing contents of non-volatile memory (NVM).

6. The SOC device as recited in claim **1**, wherein the SOC microprocessor is configured to control another SOC device.

7. The SOC device as recited in claim **1**, wherein the antenna is configured to receive a triggering signal from a wireless device, the triggering signal includes a request signal to the SOC device to perform an operation.

8. The SOC device as recited in claim **1**, wherein the antenna is a near field communications (NFC) antenna.

9. A wireless device comprising: the SOC device as recited in claim

10. A wireless device comprising:

a memory;

a processor coupled to the memory, the processor includes one or more processor-executable instructions that, when executed, perform operations comprising:

receiving data that includes vital sign measurements;

storing the vital sign measurements;

executing a software program that utilizes the stored vital sign measurements.

11. The wireless device as recited in claim **10**, wherein the memory stores the vital sign measurements that includes measurements of vital signs at different time intervals.

12. The wireless device as recited in claim **10**, wherein the vital sign measurements include a heartbeat rate, blood sugar, oxygen, blood pressure, muscle activity, neurological activity, brain waves, or body temperature.

13. The wireless device as recited in claim **10**, wherein the software program is configured to provide a triggering signal that is transmitted to a bandage patch configured to enable transmission of the vital sign measurements to the wireless device.

14. The wireless device as recited in claim **10**, wherein the software program is configured to control operations of a bandage patch configured to detect vital measurements of a person.

15. The wireless device as recited in claim **10**, further comprising an antenna configured to receive the data through a network or a radio signal.

16. The wireless device as recited in claim **10**, further comprising a chip set that is configured to provide intercommunications between the memory and the processor.

17. A method of wireless electronic monitoring by a system on chip (SOC) device, the method comprising:

detecting vital signs from a body of a person, the vital signs are converted into electrical signal;

receiving the electrical signal;

storing the electrical signal;

configuring a microprocessor to execute software program that utilizes the stored electrical signal; and

transmitting an output of the microprocessor.

18. The method as recited in claim **17**, the vital signs include at least one of a heartbeat rate, blood sugar, oxygen, blood pressure, muscle activity, neurological activity, brain waves, or body temperature.

19. The method as recited in claim **17**, wherein storing the electrical signal includes measuring at different time intervals, the stored electrical signals are utilized as variables in implementing the configured software program at the microprocessor.

20. The method as recited in claim **17**, wherein microprocessor implements the software program that includes deriving a summary of the stored electrical signals, changing frequency periods of vital signs detection, or clearing contents of non-volatile memory.

21. The method as recited in claim **17**, wherein the transmitting the output includes delivering medicine, electrical, optical, radio frequency and/or mechanical energy through a stimulator, stimulator contact, and/or sensor.

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外部链接	Espacenet USPTO		

摘要(译)

这里描述的是与人的无线电子生命体征监测有关的技术。更具体地，使用生物监测贴片检测生命体征和检测到的生命体征的处理。