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(54) **AN ADHESIVE BANDAGE AND A METHOD FOR CONTROLLING PATIENT INFORMATION**

HAFTBANDAGE UND VERFAHREN ZUR STEUERUNG VON PATIENTENINFORMATIONEN

PANSEMENT ADHÉSIF ET PROCÉDÉ DE COMMANDE D'INFORMATIONS CONCERNANT LE PATIENT

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Description

BACKGROUND OF THE INVENTION

[0001] Hospitalizing a patient involves opening a file that holds the patient's personal details. These details will be kept in the hospital's Electronic medical record (EMR). A bracelet with the patient's details written on it is attached to the patient hand and is used for identifying the patient during the hospitalization period.

[0002] During the hospitalization, a patient is monitored by a nurse that occasionally enters the room. If a problem occurs, it might not be detected on time and the late detection might lead to a health injury or even death.

[0003] In some hospital departments, the patient is constantly monitored by monitoring devices, but this kind of monitoring often involves attaching a wired device to the patient, which is awkward and cause discomfort for the patient. If the patient wants to get up of the bed, he may disconnect the wires and remain unmonitored.

[0004] The following US patents publications describe a health monitoring device for wireless monitoring vital signs: US Patent application publication serial number 2008/0221419, patent application publication serial number US 2008/0249379, patent application publication serial number US 2008/0275321, patent application publication serial number US 2008/0287800, and patent application publication serial number US 2009/0048518. US 2008/0221419, WO 2012/015844 and US 2007/100219 disclose an adhesive bandage comprising a thin sheet, a wireless transmitter, a memory unit, a monitor, a wireless receiver, an alert generator and a processor.

SUMMARY OF THE INVENTION

[0005] According to an embodiment of the invention an adhesive bandage according to claim 1 is provided. The adhesive bandage includes: a thin sheet having an underside provided with a self-adhesive; a wireless transmitter; a memory unit, coupled to the wireless transmitter, for storing a patient identifier and for storing patient data that comprises measurement thresholds, vital signs measurements and treatment data; a monitor, coupled to the memory unit, for monitoring vital signs and for generating the vital signs measurements; a wireless receiver for receiving requests to obtain requested patient data; an alert generator, coupled to the memory unit, for generating an alert if a vital sign measurement reached an associated measurement threshold; and a processor, coupled to the wireless transmitter, to the wireless receiver and to the memory unit, configured for determining whether to transmit, by the wireless transmitter, the requested patient data and the patient identifier, and configured for determining whether to transmit, by the wireless transmitter, the alert and the patient identifier and configured for determining whether to retrieve requested patient data from the memory unit or to send a second request to obtain patient data from an external database via the wireless transmitter. At least one component out of the processor, the alert generator, the wireless transmitter, the memory, the monitor, the memory unit and the wireless receiver is connected to the thin sheet.

[0006] The monitor can include compact sized sensors for measuring the vital signs.

[0007] The wireless receiver can be configured to receive additional vital signs measurement from an external device and to forward the additional vital signs measurement to the alert generator.

[0008] The processor can be arranged to determine whether to transmit the alert and the patient identifier based on an occurrence of a generation of multiple successive alerts by the alert generator.

[0009] The wireless receiver can be configured to receive patient data and wherein the processor can be configured to determine whether to store at least a portion of the patient data in the memory unit.

[0010] The wireless receiver can be configured to receive patient data, and wherein the processor can be configured to determine whether to send patient data to an external database via the wireless transmitter.

[0011] The processor is configured to determine whether to retrieve requested patient data from the memory unit or to send a second request to obtain patient data from an external database via the wireless transmitter.

[0012] The wireless receiver can be configured to receive a response to a second patient data request from the external database, and wherein the processor can be configured to determine if a patient identifier included in the response correlates to the patient identifier that is stored in the memory unit.

[0013] The adhesive bandage can include a power supply.

[0014] The wireless receiver and the wireless transmitter can be arranged to use a short range radio frequency transmission.

[0015] The wireless receiver and the wireless transmitter can be arranged to use a blue tooth transmission.

[0016] The wireless receiver and the wireless transmitter can be arranged to use an infrared transmission.

[0017] According to another embodiment of the invention a method according to claim 12 is provided. The method includes: attaching an adhesive bandage to a patient, wherein the adhesive bandage comprises a thin sheet having an underside provided with a self-adhesive, a wireless transmitter, a memory unit, a monitor, a wireless receiver, an alert generator and a processor, wherein at least one component out of the processor, the alert generator, the wireless transmitter, the memory, the monitor, the memory unit and the wireless receiver is connected to the thin sheet; storing a patient identifier and patient data in the memory unit, wherein the patient data comprises measurement thresholds, vital signs measurements and treatment data; monitoring vital signs and generating the vital signs measurements, by the

monitor; generating, by the alert generator, an alert if a vital sign measurement reached an associated measurement threshold; determining, by the processor, whether to transmit the alert and the patient identifier; transmitting the alert and the patient identifier if determining, by the processor, to transmit the alert and the patient identifier; receiving, by the wireless receiver, requests to obtain requested patient data; determining whether to retrieve the requested patient data from the memory unit or to send a second request to obtain patient data from an external database; determining, by the processor, whether to transmit the requested patient data and the patient identifier; and transmitting the requested patient data and the patient identifier if determining to transmit the requested patient data and the patient identifier.

[0018] The determining of whether to transmit the alert and the patient identifier can be responsive to an occurrence of a generation of multiple successive alerts.

[0019] The method can include receiving the patient data and determining whether to store at least a portion of the patient data in the memory unit.

[0020] The method can include receiving the patient data and determining whether to send the patient data to an external database.

[0021] The method includes determining whether to retrieve the requested patient data from the memory unit or to send a second request to obtain patient data from an external database.

[0022] The method can include receiving a response to a second patient data request from the external database, and determining if a patient identifier indicated in the response correlates to the patient identifier stored in the memory unit.

[0023] The method can include monitoring vital signs selected from a list consisting of a body temperature, a heartbeat, one lead ECG measurement, O_2 saturation and blood pressure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The subject matter regarded as the invention is particularly pointed out and distinctly claimed in the concluding portion of the specification. The invention, however, both as to organization and method of operation, together with objects, features, and advantages thereof, may best be understood by reference to the following detailed description when read with the accompanying drawings in which:

Fig. 1 illustrates the interfaces of an adhesive bandage with external computers, according to an embodiment of the invention;

Fig. 2 is a block diagram of the adhesive bandage, according to an embodiment of the invention;

Fig. 3 is a schematic block diagram of the adhesive bandage, according to an embodiment of the invention;

Fig. 4 illustrates the adhesive bandage attached to a human body, according to an embodiment of the invention; and

Fig. 5 and Fig. 6 schematically show a flow diagram of a method for controlling a patient data, according to an embodiment of the invention.

[0025] It will be appreciated that for simplicity and clarity of illustration, elements shown in the figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements may be exaggerated relative to other elements for clarity. Further, where considered appropriate, reference numerals may be repeated among the figures to indicate corresponding or analogous elements.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[0026] In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be understood by those skilled in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, and components have not been described in detail so as not to obscure the present invention.

[0027] An adhesive bandage for controlling information related to a hospitalized patient is provided. The adhesive bandage is attached to the patient body during a hospitalization period and controls the entire patient's data: personal details including patient's identifier (ID), medical information, a treatment log, test results, drugs prescription and dosage and vital signs monitored measurements.

[0028] The adhesive bandage can either store at least part of the patient data in an internal memory unit or it can communicate with a hospital central computer for retrieving patient data from a patient database and for sending patient data that is to be stored in the patient database.

[0029] A patient ID that is stored within the internal memory unit of the adhesive bandage is used in each data exchange between the adhesive bandage and the hospital computer, as to identify the patient record in the patient database.

[0030] Figure 1 illustrates adhesive bandage 100 and its external interfaces. Adhesive bandage 100 communicates with an external database 55, e.g. a patient database that stores EMR records of patients, that resides in a hospital computer 50, by utilizing a wireless communication channel 82 through an intermediate dual channel modem 70. Modem 70 communicates with adhesive bandage 100 over a wireless channel 82 on one side and communicates with hospital computer 50 on the other side, using a wired channel 83, e.g. a local area network.

[0031] Wireless channel 82 is implemented by using a short range wireless technique e.g. short range RF (Radio Frequency), IR (Infra Red), Blue tooth, or any other

short range wireless transmission.

[0032] Adhesive bandage 100 also communicates with a handheld device 60 through a wireless channel 81 that implements a similar wireless technique as wireless channel 82. Handheld device 60, e.g. a Personal Digital Assistant (PDA) is used by a medical practitioner that examines the patient and can retrieve patient data controlled by adhesive bandage 100 or update patient data. Retrieving patient data can involve either reading data that is stored within the internal memory unit of adhesive bandage 100 or further request the retrieval of the data from external database 55. Updating patient data, that is requested by handheld device 60 of the medical practitioner, can involve either storing the updated data on the internal memory unit of adhesive bandage 100, sending the updated data to external database 55 or performing both operations. In the latter case, some of the patient data is redundant (resides on both the internal memory unit and external database 55).

[0033] During the admission of the patient to the hospital (a process that is usually taken place in the ER), a new patient record 51 is opened in external database 55 that resides on hospital computer 50 and the patient details are recorded in the new patient record. Hospital computer 50 transmits a message: patient details message 40 to adhesive bandage 100, the message contains at least part of the patient details that are stored in patient record 51. Patient details message 40 is received by adhesive bandage 100, through a wireless communication channel 82. The patient details contained in patient details message 40 are stored in the internal memory unit of adhesive bandage 100 and include at least the patient ID but can include further information, such as: known sensitivities to drugs, phone numbers to be called in case of emergency, reason of the hospitalization, drugs that have been taken by the patient before or during the hospitalization, and other personal details.

[0034] Treatment data that is gathered during the hospitalization period will be stored in patient record 51 of external database 55, allowing access to any medical practitioner that treats the patient. The treatment data or a portion thereof can be redundantly stored in the internal memory unit of adhesive bandage 100. The treatment data includes: test results, drugs prescription and dosage and any medical procedure executed during the hospitalization.

[0035] The medical practitioner uses handheld device 60 for retrieving patient data and updating data. When retrieving patient data, handheld device 60 will send adhesive bandage 100, over wireless channel 81, an information retrieval request 31, requesting to obtain requested patient data, adhesive bandage 100 will check if the requested patient data resides within its internal memory unit. If the requested patient data is found in the internal memory unit, adhesive bandage 100 transmits an information retrieval response 32 to handheld device 60, containing the requested patient data. If the requested patient data is not stored in the internal memory unit, adhesive bandage 100 will read the patient ID that is stored within its internal memory unit, attach it to information retrieval request 31 to provide an identified information retrieval request 41, establish a connection to hospital computer 50 through modem 70 by using wireless channel 82 and send identified information retrieval request 41.

[0036] When adhesive bandage 100 receives an identified information retrieval response 42 from hospital computer 50, it determines if a patient identifier indicated in the response correlates to the patient identifier stored in the memory unit and if a correlation is verified, adhesive bandage 100 transmits an information retrieval response 32 to handheld device 60 of the medical practitioner that requested the information.

[0037] When the medical practitioner wishes to update treatment data or add new treatment data, he types the new or updated treatment data into his handheld device 60 that in turn sends a message - treatment information 33 to adhesive bandage 100. Adhesive bandage 100 attaches the patient ID that is stored in its internal memory unit, to treatment information 33, as to provide a message-identified treatment information 43 and transmits identified treatment information 43 to hospital computer 50 for storing the new or updated treatment information in patient record 51 of external database 55.

[0038] Adhesive bandage 100 can periodically monitor the vital signs of the patient and compare vital signs measurements to predefined measurement thresholds. The monitoring can include reading measurements of the following vital signs: body temperature, heartbeat, ECG, O_2 saturation (blood oxygen level), blood pressure, or any other vital signs.

[0039] Measurement thresholds that are suited for the patient are predetermined by a physician during the patient admission to the hospital, in which case the measurement thresholds are sent from external database 55 to adhesive bandage 100, as part of message - patient details 40. The physician can change the measurement thresholds any time, during the hospitalization, in which case, the new thresholds are entered by the physician using handheld device 60 and are sent to adhesive bandage 100 by a message - measurement thresholds 34. A measurement threshold can include a lower limit of the measurement target, an upper limit or both limits.

[0040] Adhesive bandage 100 periodically reads the vital signs within predefined time intervals. The predefined intervals can also be changed during the hospitalization period of the patient. If at least one vital sign measurement drops below the lower limit or rises above the upper limit of the measurement target, adhesive bandage 100 will send a threshold reached alert 44 to hospital computer 50 or to any other computer that handles alerts. Threshold reached alert 44 includes the patient ID, the vital sign which measurement has reached a threshold, the value of the at least one measurement and optionally previously measured values.

[0041] The vital sign thresholds can include: required

temperature range: 36.5° to 37.5°; O_2 saturation: 95%, etc. The measurement thresholds will be stored in the adhesive bandage and will be transmitted to the hospital computer.

[0042] Figure 2 is a block diagram that illustrates a monitoring and storing module 180 of adhesive bandage 100. Monitoring and storing module 180 is the principal module of adhesive bandage 100 and includes: (i) a monitor 150 for reading vital signs of a patient. Monitor 150 includes compact sized sensors, collectively denoted 113.

[0043] Three compact sized sensors, 113(1)-113(3), are illustrated in figure 2, but any other amount of sensors can be implemented. Sensors 113 can read any kind of vital sign such as, but not limited to: temperature, heartbeat, blood pressure, O_2 saturation, 1 lead ECG, etc.

[0044] Monitor 150 further includes various components that handles analogue signals including: an operational amplifier 111, an Analog to Digital convertor 109 and a preprocessing unit 107 that includes at least filters; (ii) a wireless transceiver 101 that includes both a wireless transmitter and wireless receiver that can transmit and receive wireless communication and communicates with handheld device 60 and with computer hospital 50 or any other computer; (iii) an alert generator 108 receives vital signs measurements from monitor 150 and generates an alert in case a vital signs measurement reaches an associated measurement threshold; (iv) a processor 103 for determining whether to send threshold reached alert 44 based on the alert generated by the alert generator; controlling wireless transceiver 101 and internal storage 105; and handling all the communication messages between adhesive bandage 100 and hospital computer 50 and all the communication messages between adhesive bandage 100 and handheld device 60 or any other computer; and (v) memory unit 105 for storing: patient identifier, patient data, treatment data, measurement thresholds and optionally vital signs measurement that were read in at least one previous monitoring cycle.

[0045] Wireless transceiver 101 can receive vital signs measurement from an external device and forward the vital signs measurement to the alert generator. E.g., the blood pressure or ECG can be wirelessly transmitted by the external device and received by wireless transceiver 101 of adhesive bandage 100.

[0046] Adhesive bandage 100 is personal and intended for a single use. Figure 4 illustrates adhesive bandage 100 that includes monitoring and storing module 180 that is attached to a sticky strip 150, wherein sticky strip 150 is adapted to be attached to a body of a patient. Sticky strip 150 is a thin sheet having an underside provided with a self-adhesive. Since sticky strip 150 might irritate the skin and since it can lose its sticking ability, there might be a need for replacing sticky strip 150. Monitoring and storing module 180 can be detached from sticky strip 150 and re-attached to a new sticky strip. Sticky strip 150 can hold a power source 120, so it can be replace each time sticky strip 150 is replaced.

[0047] According to an embodiment of the invention, adhesive bandage 100 contains a location tracker element, e.g. a GPS or an RFID, that can track down a patient location in the hospital environment.

[0048] Figure 4 illustrates the various options of attaching adhesive bandage 100 to a patient body. Adhesive bandage 100 can be attached to the wrist 410, an inner part of the arm 420, the armpit 430 or the chest 440.

[0049] Figure 5 is a flow diagram of a method 500 for controlling a patient data according to an embodiment of the invention.

[0050] Method 500 starts with stage 505 of attaching an adhesive bandage to a patient, wherein the adhesive bandage comprises a thin sheet having an underside provided with a self-adhesive, a wireless transmitter, a memory unit, a monitor, a wireless receiver, an alert generator and a processor, wherein at least one component out of the processor, the alert generator, the wireless transmitter, the memory, the monitor, the memory unit and the wireless receiver is connected to the thin sheet.

[0051] Stage 505 is followed by stage 510 of receiving patient details and storing the patient details in the memory unit of the adhesive bandage. This stage is taking place upon a patient admission to the hospital. The patient details are received from an external database that may hold a record for each patient during a hospitalization period. The patient details include at least a patient identifier (ID) and may include other personal details, phone numbers to be called in case of emergency, known sensitivities to drugs, reason of the hospitalization, drugs that have been taken by the patient before the hospitalization and so on. The patient details may further include predetermined measurement thresholds of vital signs and time intervals for monitoring the vital signs. Stage 510 may be repeated later on for updating patient details, such as updating the measurement thresholds.

[0052] Method 500 further includes stages 520, 530 and 540.

[0053] Stage 520 of receiving and controlling treatment data includes stage 522 of sending the treatment data and the patient identifier to an external database, such as the hospital patient database. Stage 522 includes reading the patient identifier from the memory unit of the adhesive bandage. The treatment data may include drugs prescription and dosage or any other treatment orders and medical procedures.

[0054] Stage 520 optionally includes stage 524 of storing at least a portion of the treatment data in the memory unit.

[0055] Method 500 may include stage 530 of handling monitored vital signs. Stage 530 starts with stage 532 of receiving measurement thresholds. The receiving of measurement thresholds can be a part of stage 510 that is taking place upon a patient admission to the hospital, in which case the measurement thresholds can be part of the patient details that are received in stage 510. Alternatively or additionally, the receiving of measurement

thresholds can take place at any time during the hospitalization period, i.e. the physician can change the initial values of the measurement thresholds that were determined in stage 510.

[0056] Stage 530 further includes stage 534 of receiving vital signs measurements sampled by sensors or external devices. The receiving of vital signs measurements can include reading the measurements from sensors that are included in adhesive bandage 100. Such sensors are capable of sensing body temperature, heartbeat, 1 lead ECG, O_2 saturation, blood pressure, or any other vital sign. Alternatively, the receiving of vital signs measurements can include receiving the measurements from external devices, e.g. a sphygmomanometer, that communicates with wireless transceiver 101.

[0057] Optionally, stage 530 includes stage 536 of storing the vital signs measurements in the memory unit. The stored vital signs measurements can be used for later retrieval or for sending a threshold reached alert that is based on several measurements, thus avoiding sending an alert upon every irregular measurement.

[0058] Stage 530 includes stage 538 of determining whether to send a threshold reached alert based on the measurement thresholds and at least one vital sign measurements and sending the alert to a central computer. Each measurement threshold includes at least one of: a lower limit and an upper limit allowed for a measurement. A measurement threshold can be considered as reached, if the vital sign measurement has been dropped below a lower limit or exceeded an upper limit defined by the measurement threshold. The determination can be conducted according to a single measurement, or according to multiple irregular successive measurements that were stored in the memory unit at stage 536. If the determination is that the threshold is reached, then a threshold reached alert will be sent through the wireless transceiver to an alert center.

[0059] Stage 538 can be followed by stage 539 of wirelessly transmitting the threshold reached alert if determining (during stage 538) to transmit the threshold reached alert.

[0060] Method 500 includes stage 540 of retrieving a patient data. Stage 540 starts with stage 542 of receiving an information retrieval request indicating the required patient data. The information retrieval request can request any of the following items: patient details such as: patient ID, address, phone number and other personal details, known drug sensitivities, known diseases/symptoms or any other medical history information;
treatment information, such as the log of medical procedures applied during the hospitalization; measurements thresholds determined for the patient; and monitored vital signs measurements that were recorded.

[0061] The information retrieval request can be sent to the adhesive bandage from a handheld device operated by the physician.

[0062] Stage 542 is followed by stage 540 of determining whether the required patient data exists on the memory unit of the adhesive bandage. A patient data can reside on a hospital's central database, on both memory unit and the central database and some data can reside only on the memory unit, for example: recent vital signs measurement are only stored in the memory unit and are not reported to the alert center unless a threshold is reached.

[0063] If the determination is that the patient data exists on the memory unit, then stage 542 is followed by stage 546 of retrieving the required patient data from the memory unit.

[0064] If the determination is that the patient data do not exist on the memory unit, then it should be retrieved from the external database in which case stage 542 is followed by stage 548 of retrieving the patient ID from the memory unit and add it to information retrieval request so as to provide an identified information retrieval request and send the identified information retrieval request to the external database.

[0065] Stage 548 is followed by stage 550 of receiving an identified information retrieval response from the external database.

[0066] Stage 550 is followed by stage 552 of sending an information retrieval response to the handheld device. Stage 552 may include verifying that a patient ID indicated in the identified information retrieval response is the same patient ID that is stored in the memory unit.

Claims

1. An adhesive bandage (100), comprising:

a thin sheet having an underside provided with a selfadhesive;
a wireless transmitter;
a memory unit (105), coupled to the wireless transmitter, for storing a patient identifier (ID) and for storing patient data that comprises measurement thresholds, vital signs measurements and treatment data;
a monitor (150), coupled to the memory unit (105), for monitoring vital signs and for generating the vital signs measurements;
a wireless receiver for receiving requests to obtain requested patient data;
an alert generator (108), coupled to the memory unit (105), for generating an alert (44) if a vital sign measurement reached an associated measurement threshold; and
a processor (103), coupled to the wireless transmitter, to the wireless receiver and to the memory unit (105), and configured

for determining whether to transmit, by the wireless transmitter, the requested patient data and the patient identifier (ID); and
for determining whether to transmit, by the

wireless transmitter, the alert (44) and the patient identifier (ID); and
for determining whether to retrieve requested patient data from the memory unit (105) or to send a second request to obtain patient data from an external database via the wireless transmitter;

and
wherein at least one component out of the processor (103), the alert generator (108), the wireless transmitter, the memory, the monitor (150), the memory unit (105) and the wireless receiver is connected to the thin sheet.

2. The adhesive bandage of claim 1, wherein the monitor (150) comprises compact sized sensors (113) for measuring the vital signs.

3. The adhesive bandage of claim 1, wherein the wireless receiver is configured to receive additional vital signs measurement from an external device and to forward the additional vital signs measurement to the alert generator (108).

4. The adhesive bandage of claim 1, wherein the processor (103) is arranged to determine whether to transmit the alert (44) and the patient identifier (ID) based on an occurrence of a generation of multiple successive alerts by the alert generator (108).

5. The adhesive bandage of claim 1, wherein the wireless receiver is configured to receive patient data and wherein the processor (103) is configured to determine whether to store at least a portion of the patient data in the memory unit (105).

6. The adhesive bandage of claim 1, wherein the wireless receiver is configured to receive patient data, and wherein the processor (103) is configured to determine whether to send patient data to an external database via the wireless transmitter.

7. The adhesive bandage of claim 1, wherein the wireless receiver is configured to receive a response to a second patient data request from the external database, and wherein the processor (103) is configured to determine if a patient identifier (ID) included in the response correlates to the patient identifier (ID) that is stored in the memory unit (105).

8. The adhesive bandage of claim 1, further comprising a power supply (120).

9. The adhesive bandage of claim 1, wherein the wireless receiver and wireless transmitter are arranged to use a short range radio frequency transmission.

10. The adhesive bandage of claim 1, wherein the wireless receiver and wireless transmitter are arranged to use a blue tooth transmission.

11. The adhesive bandage of claim 1, wherein the wireless receiver and wireless transmitter are arranged to use an infrared transmission.

12. A method (500) for controlling a patient data, the method comprising:

attaching an adhesive bandage (100) to a patient (505), wherein the adhesive bandage (100) comprises a thin sheet having an underside provided with a selfadhesive, a wireless transmitter, a memory unit (105), a monitor (150), a wireless receiver, an alert generator (108) and a processor (103), wherein at least one component out of the processor (103), the alert generator (108), the wireless transmitter, the memory, the monitor (150), the memory unit (105) and the wireless receiver is connected to the thin sheet;
storing a patient identifier (ID) and patient data in the memory unit (105), wherein the patient data comprises measurement thresholds, vital signs measurements and treatment data;
monitoring vital signs and generating the vital signs measurements, by the monitor (150);
generating, by the alert generator (108), an alert (44) if a vital sign measurement reached an associated measurement threshold;
determining, by the processor (103), whether to transmit the alert (44) and the patient identifier (ID);
transmitting the alert (44) and the patient identifier (ID) if determining, by the processor (103), to transmit the alert (44) and the patient identifier (ID);
receiving, by the wireless receiver, requests to obtain requested patient data;
determining whether to retrieve the requested patient data from the memory unit (105) or to send a second request to obtain patient data from an external database;
determining, by the processor (103), whether to transmit the requested patient data and the patient identifier (ID); and
transmitting the requested patient data and the patient identifier (ID) if determining to transmit the requested patient data and the patient identifier (ID).

13. The method (500) of claim 12, wherein the determining of whether to transmit the alert (44) and the patient identifier (ID) is responsive to an occurrence of a generation of multiple successive alerts.

14. The method (500) of claim 12, further comprising

receiving the patient data and determining whether to store at least a portion of the patient data in the memory unit (105).

15. The method (500) of claim 12, further comprising receiving the patient data and determining whether to send the patient data to an external database.

16. The method (500) of claim 12, further comprising receiving a response to a second patient data request from the external database, and determining if a patient identifier (ID) indicated in the response correlates to the patient identifier (ID) stored in the memory unit (105).

17. The method (500) of claim 12, comprising monitoring vital signs selected from a list consisting of a body temperature, a heart beat, one lead ECG measurement, O_2 saturation and blood pressure.

Patentansprüche

1. Eine Haftbandage (100), umfassend:

eine dünne Platte bzw. Schicht, deren Unterseite mit einem selbst-haftenden Mittel versehen ist;
einen drahtlosen Sender;
eine Speichereinheit (105), die mit dem drahtlosen Sender gekoppelt ist, zur Speicherung von patientenidentifizierenden Daten (ID) und zur Speicherung von Patientendaten, welche Messschwellen, Vitalzeichen-Messungen und Behandlungsdaten umfassen;
einen Monitor (150), der mit der Speichereinheit (105) verbunden ist, zur Überwachung von Vitalzeichen und zur Erzeugung von Vitalzeichenmessungen;
einen drahtlosen Empfänger zum Empfang von Anfragen zum Erhalt angeforderter Patientendaten;
einen Alarmgenerator (108), der mit Speichereinheit (105) verbunden ist, zur Erzeugung eines Alarms (44), wenn eine Vitalzeichenmessung eine entsprechende Messschwelle erreicht hat; und
einen Prozessor (103), der mit dem drahtlosen Sender, dem drahtlosen Empfänger und der Speichereinheit (105) verbunden ist, und ausgelegt ist

zur Bestimmung, ob die angeforderten Patientendaten und die patientenidentifizierenden Daten (ID) durch den drahtlosen Sender zu übermitteln sind; und
zur Bestimmung, ob durch den drahtlosen Sender der Alarm (44) und die patientenidentifizierenden Daten (ID) zu übermitteln sind; und
zur Bestimmung, ob angeforderte Patientendaten von der Speichereinheit (105) abzurufen sind, oder ob eine zweite Anfrage zu senden ist, um Patientendaten über den drahtlosen Sender von einer externen Datenbank zu erhalten,
und

wobei wenigstens eine der Komponenten Prozessor (103), Alarmgenerator (108), drahtloser Sender, Speicher, Monitor (150), Speichereinheit (105) und drahtloser Empfänger mit der dünnen Platte bzw. Schicht verbunden ist.

2. Haftbandage gemäß Anspruch 1, wobei der Monitor (105) Sensoren (113) kompakter Größe zur Messung der Vitalzeichen umfasst.

3. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger so konfiguriert ist, dass er eine zusätzliche Vitalzeichen-Messung von einer externen Vorrichtung empfängt und die zusätzliche Vitalzeichen-Messung an den Alarmgenerator (108) übermittelt.

4. Haftbandage gemäß Anspruch 1, wobei der Prozessor (103) so angeordnet ist, zu bestimmen, ob auf Grundlage des Auftretens der Erzeugung mehrfacher sukzessiver Alarme durch den Alarmgenerator (108) der Alarm (44) und die patientenidentifizierenden Daten (ID) zu übermitteln sind.

5. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger so konfiguriert ist, dass er Patientendaten empfängt, und wobei der Prozessor (103) so konfiguriert ist zu bestimmen, ob wenigstens ein Teil der Patientendaten in der Speichereinheit (105) zu speichern ist.

6. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger so konfiguriert ist, dass er Patientendaten empfängt, und wobei der Prozessor (103) so konfiguriert ist zu bestimmen, ob die Patientendaten über den drahtlosen Sender an eine externe Datenbank zu senden sind.

7. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger so konfiguriert ist, dass er eine Antwort auf eine zweite Anfrage bezüglich der Patientendaten von der externen Datenbank empfängt, und wobei der Prozessor (103) so konfiguriert ist zu bestimmen, ob die patientenidentifizierenden Daten (ID), die in der Antwort enthalten sind, mit den patientenidentifizierenden Daten (ID) korrelieren, die in der Speichereinheit (105) gespeichert sind.

8. Haftbandage gemäß Anspruch 1, welche ferner eine Energieversorgung (120) umfasst.

9. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger und der drahtlose Sender so angeordnet sind, dass sie eine Kurzstrecken-Radiofrequenzübertragung verwenden.

10. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger und der drahtlose Sender so angeordnet sind, dass sie Bluetooth-Übertragung verwenden.

11. Haftbandage gemäß Anspruch 1, wobei der drahtlose Empfänger und der drahtlose Sender so angeordnet sind, dass sie Infrarot-Übertragung verwenden.

12. Verfahren (500) zur Kontrolle von Patientendaten, wobei das Verfahren umfasst:

Anbringen einer Haftbandage (100) an einem Patienten (505), wobei die Haftbandage (100) umfasst: eine dünne Platte bzw. Schicht, deren Unterseite mit einem selbst-haftenden Mittel versehen ist; einen drahtlosen Sender; eine Speichereinheit (105), einen Monitor (150), einen drahtlosen Empfänger, einen Alarmgenerator (108) und einen Prozessor (103), wobei wenigstens eine der Komponenten Prozessor (103), Alarmgenerator (108), drahtloser Sender, Speicher, Monitor (150), Speichereinheit (105) und drahtloser Empfänger mit der dünnen Platte bzw. Schicht verbunden ist;
Speichern von patientenidentifizierenden Daten (ID) und Patientendaten in der Speichereinheit (105), wobei die Patientendaten Messschwellen, Vitalzeichen-Messungen und Behandlungsdaten umfassen;
Überwachen von Vitalzeichen und Erzeugen von Vitalzeichen-Messungen durch den Monitor (150);
Erzeugen durch den Alarmgenerator (108), eines Alarms (44), wenn eine Vitalzeichen-Messung eine entsprechende Messschwelle erreicht hat;
Bestimmen, durch den Prozessor (103), ob der Alarm (44) und die patientenidentifizierenden Daten (ID) zu übermitteln sind;
Übermitteln des Alarms (44) und der patientenidentifizierenden Daten (ID), wenn durch den Prozessor (103) bestimmt wird, dass der Alarm (44) und die patientenidentifizierenden Daten (ID) zu übermitteln sind;
Empfangen von Anfragen, durch den drahtlosen Empfänger, zum Erhalt angeforderter Patientendaten;
Bestimmen, ob angeforderte Patientendaten von der Speichereinheit (105) abzurufen sind, oder ob eine zweite Anfrage zu senden ist, um Patientendaten über den drahtlosen Sender von einer externen Datenbank zu erhalten;
Bestimmen, durch den Prozessor (103), ob die angeforderten Patientendaten und die patientenidentifizierenden Daten (ID) zu übermitteln sind; und
Übermitteln der angeforderten Patientendaten und der patientenidentifizierenden Daten (ID), wenn bestimmt wird, dass die angeforderten Patientendaten und die patientenidentifizierenden Daten (ID) zu übermitteln sind.

13. Verfahren (500) gemäß Anspruch 12, wobei die Bestimmung, ob der Alarm (44) und die patientenidentifizierenden Daten (ID) zu übermitteln sind, als Antwort auf das Auftreten der Erzeugung mehrfacher sukzessiver Alarme erfolgt.

14. Verfahren (500) gemäß Anspruch 12, welches ferner den Empfang der Patientendaten und das Bestimmen, ob wenigstens ein Teil der Patientendaten in der Speichereinheit (105) zu speichern ist, umfasst.

15. Verfahren (500) gemäß Anspruch 12, welches ferner das Empfangen von Patientendaten und das Bestimmen, ob die Patientendaten an eine externe Datenbank zu übermitteln sind, umfasst.

16. Verfahren (500) gemäß Anspruch 12, welches ferner das Empfangen einer Antwort auf eine zweite Anfrage von Patientendaten von einer externen Datenbank und das Bestimmen, ob patientenidentifizierende Daten (ID), die in der Antwort indiziert sind, mit den patientenidentifizierenden Daten (ID) korreliert, die in der Speichereinheit (105) gespeichert sind, umfasst.

17. Verfahren (500) gemäß Anspruch 12, welches das Überwachen von Vitalzeichen, ausgewählt aus einer Liste, bestehend aus Körpertemperatur, Herzschlag, Einzel-Elektroden-EKG-Messung, O_2-Sättigung und Blutdruck, umfasst.

Revendications

1. Pansement adhésif (100), comprenant :

une mince feuille ayant une face inférieure munie d'un auto-adhésif ;
un émetteur sans fil ;
une unité de mémoire (105), couplée à l'émetteur sans fil, pour mémoriser un identifiant de patient (ID) et pour mémoriser des données de patient qui comprennent des seuils de mesure, des mesures de signes vitaux et des données

de traitement ;
un moniteur (150), couplé à l'unité de mémoire (105), pour surveiller des signes vitaux et pour générer les mesures de signes vitaux ;
un récepteur sans fil pour recevoir des demandes d'obtention de données de patient demandées ;
un générateur d'alerte (108), couplé à l'unité de mémoire (105), pour générer une alerte (44) si une mesure de signe vital a atteint un seuil de mesure associé ; et
un processeur (103), couplé à l'émetteur sans fil, au récepteur sans fil et à l'unité de mémoire (105), et configuré
pour déterminer s'il faut ou non transmettre, par l'émetteur sans fil, les données de patient demandées et l'identifiant de patient (ID) ; et
pour déterminer s'il faut ou non transmettre, par l'émetteur sans fil, l'alerte (44) et l'identifiant de patient (ID) ; et
pour déterminer s'il faut ou non récupérer des données de patient demandées de l'unité de mémoire (105) ou envoyer une deuxième demande d'obtention de données de patient d'une base de données externe via l'émetteur sans fil ; et
dans lequel au moins un composant parmi le processeur (103), le générateur d'alerte (108), l'émetteur sans fil, la mémoire, le moniteur (150), l'unité de mémoire (105) et le récepteur sans fil est relié à la mince feuille.

2. Pansement adhésif selon la revendication 1, dans lequel le moniteur (150) comprend des capteurs de taille compacte (113) pour mesurer les signes vitaux.

3. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil est configuré pour recevoir une mesure de signes vitaux supplémentaire d'un dispositif externe et pour transférer la mesure de signes vitaux supplémentaire au générateur d'alerte (108).

4. Pansement adhésif selon la revendication 1, dans lequel le processeur (103) est agencé pour déterminer s'il faut ou non transmettre l'alerte (44) et l'identifiant de patient (ID) sur la base d'une apparition d'une génération de multiples alertes successives par le générateur d'alerte (108).

5. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil est configuré pour recevoir des données de patient et dans lequel le processeur (103) est configuré pour déterminer s'il faut ou non mémoriser au moins une partie des données de patient dans l'unité de mémoire (105).

6. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil est configuré pour recevoir des données de patient, et dans lequel le processeur (103) est configuré pour déterminer s'il faut ou non envoyer des données de patient à une base de données externe via l'émetteur sans fil.

7. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil est configuré pour recevoir une réponse à une deuxième demande de données de patient de la base de données externe, et dans lequel le processeur (103) est configuré pour déterminer si un identifiant de patient (ID) inclus dans la réponse est corrélé à l'identifiant de patient (ID) qui est mémorisé dans l'unité de mémoire (105).

8. Pansement adhésif selon la revendication 1, comprenant en outre une alimentation électrique (120).

9. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil et l'émetteur sans fil sont agencés pour utiliser une transmission par radiofréquence à courte portée.

10. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil et l'émetteur sans fil sont agencés pour utiliser une transmission Bluetooth.

11. Pansement adhésif selon la revendication 1, dans lequel le récepteur sans fil et l'émetteur sans fil sont agencés pour utiliser une transmission infrarouge.

12. Procédé (500) de contrôle de données de patient, le procédé comprenant :

la fixation d'un pansement adhésif (100) à un patient (505), dans lequel le pansement adhésif (100) comprend une mince feuille ayant une face inférieure munie d'un auto-adhésif, un émetteur sans fil, une unité de mémoire (105), un moniteur (150), un récepteur sans fil, un générateur d'alerte (108) et un processeur (103), dans lequel au moins un composant parmi le processeur (103), le générateur d'alerte (108), l'émetteur sans fil, la mémoire, le moniteur (150), l'unité de mémoire (105) et le récepteur sans fil est relié à la mince feuille ;
la mémorisation d'un identifiant de patient (ID) et de données de patient dans l'unité de mémoire (105), dans lequel les données de patient comprennent des seuils de mesure, des mesures de signes vitaux et des données de traitement ;
la surveillance de signes vitaux et la génération des mesures de signes vitaux, par le moniteur (150) ;
la génération, par le générateur d'alerte (108), d'une alerte (44) si une mesure de signe vital a atteint un seuil de mesure associé ;

le fait de déterminer, par le processeur (103), s'il faut ou non transmettre l'alerte (44) et l'identifiant de patient (ID) ;
la transmission de l'alerte (44) et de l'identifiant de patient (ID) s'il est déterminé, par le processeur (103), de transmettre l'alerte (44) et l'identifiant de patient (ID) ;
la réception, par le récepteur sans fil, de demandes d'obtention de données de patient demandées ;
le fait de déterminer s'il faut ou non récupérer les données de patient demandées de l'unité de mémoire (105) ou envoyer une deuxième demande d'obtention de données de patient d'une base de données externe ;
le fait de déterminer, par le processeur (103), s'il faut ou non transmettre les données de patient demandées et l'identifiant de patient (ID) ; et
la transmission des données de patient demandées et de l'identifiant de patient (ID) s'il est déterminé de transmettre les données de patient demandées et l'identifiant de patient (ID).

13. Procédé (500) selon la revendication 12, dans lequel le fait de déterminer s'il faut ou non transmettre l'alerte (44) et l'identifiant de patient (ID) répond à une apparition d'une génération de multiples alertes successives.

14. Procédé (500) selon la revendication 12, comprenant en outre la réception des données de patient et le fait de déterminer s'il faut ou non mémoriser au moins une partie des données de patient dans l'unité de mémoire (105).

15. Procédé (500) selon la revendication 12, comprenant en outre la réception des données de patient et le fait de déterminer s'il faut ou non envoyer les données de patient à une base de données externe.

16. Procédé (500) selon la revendication 12, comprenant en outre la réception d'une réponse à une deuxième demande de données de patient de la base de données externe, et le fait de déterminer si un identifiant de patient (ID) indiqué dans la réponse est corrélé à l'identifiant de patient (ID) mémorisé dans l'unité de mémoire (105).

17. Procédé (500) selon la revendication 12, comprenant la surveillance de signes vitaux sélectionnés dans une liste constituée d'une température corporelle, un battement de cœur, une mesure d'ECG à une dérivation, une saturation en O_2 et une pression artérielle.

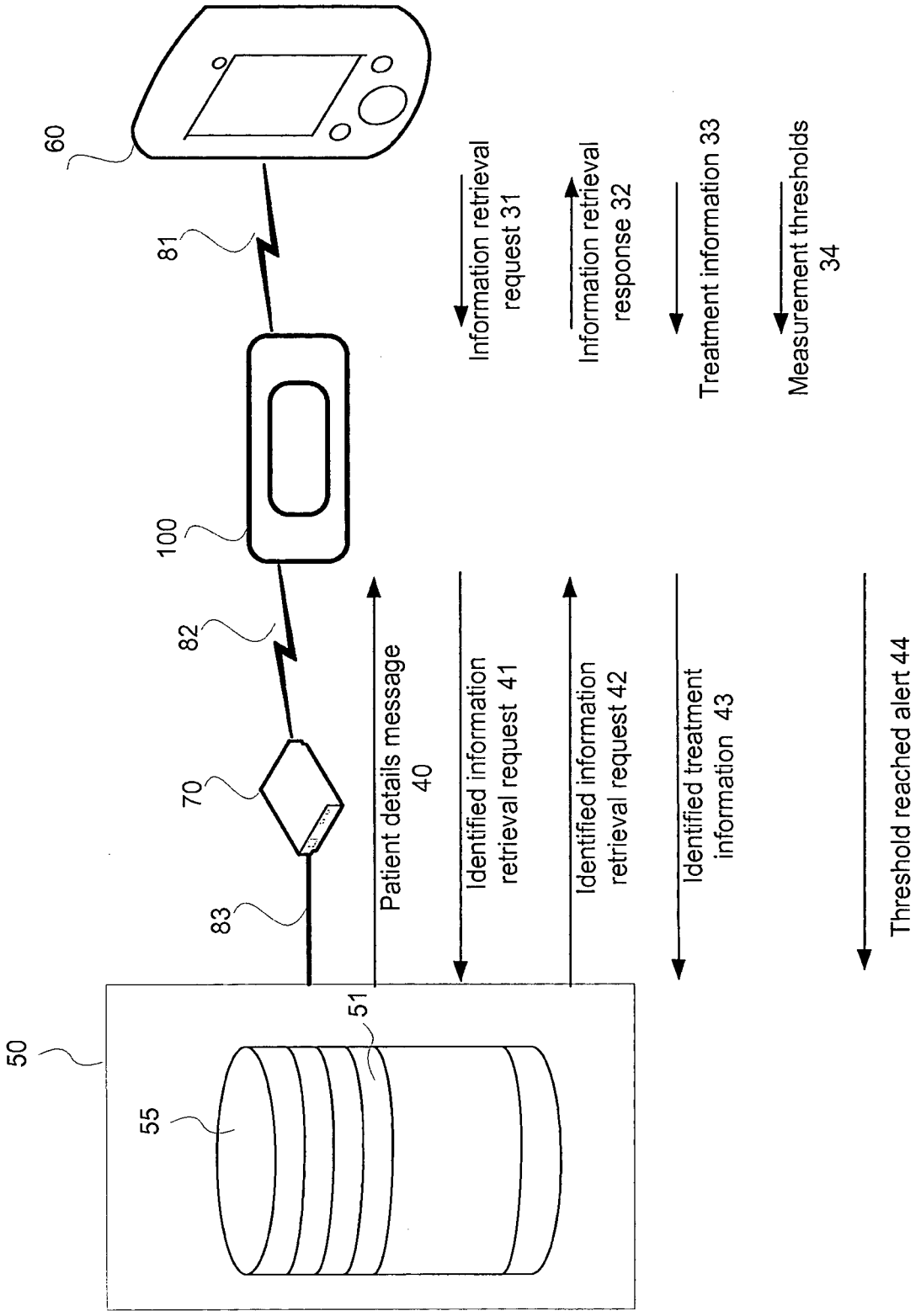
60
81
100
82
70
83
50
55
51
Information retrieval request 31
Information retrieval response 32
Treatment information 33
Measurement thresholds 34
Patient details message 40
Identified information retrieval request 41
Identified information retrieval request 42
Identified treatment information 43
Threshold reached alert 44

FIG.1

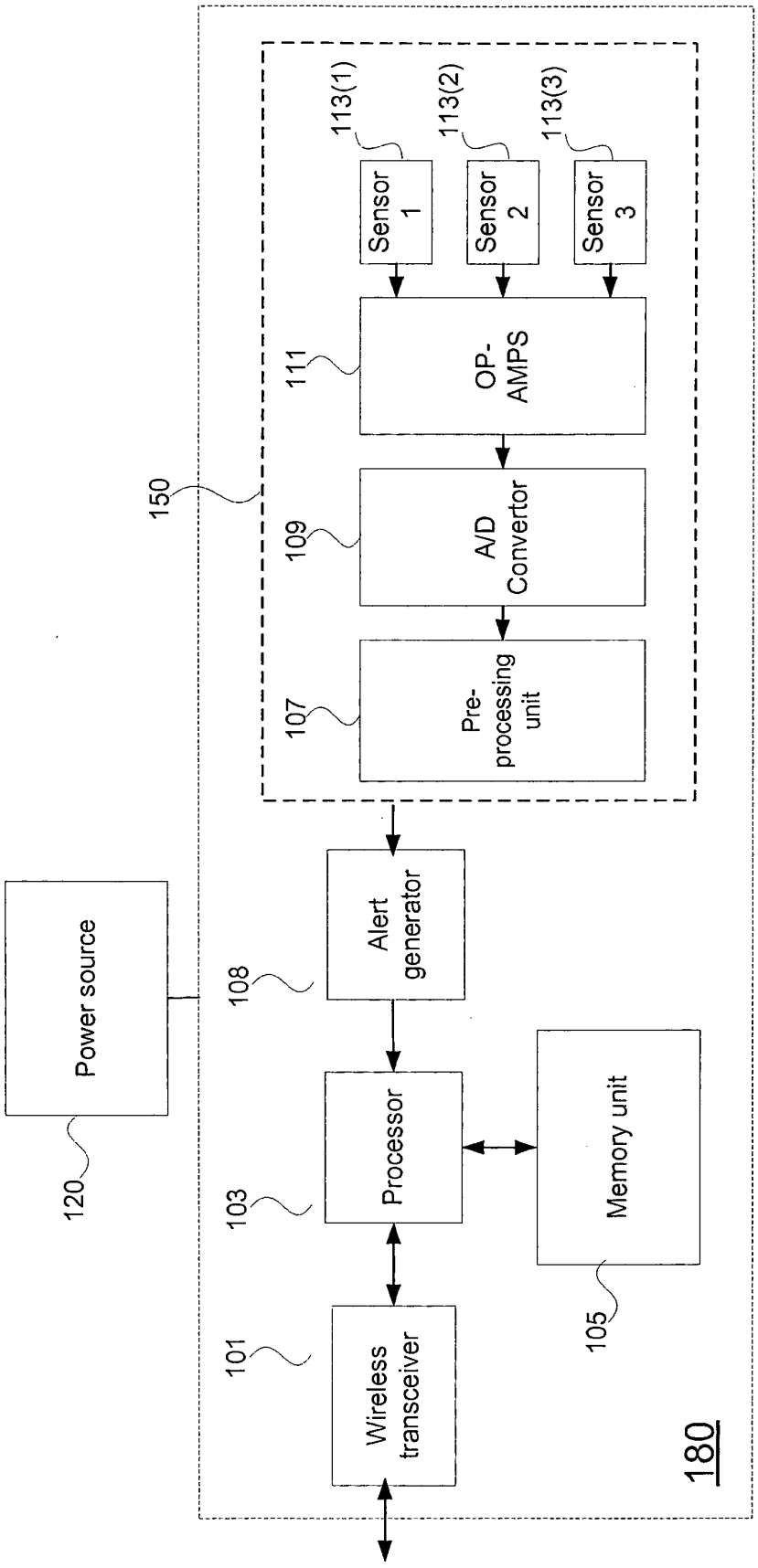
Power source
120
180
150
Wireless transceiver
101
Processor
103
Memory unit
105
Alert generator
108
Pre-processing unit
107
A/D Convertor
109
OP-AMPS
111
Sensor 1
Sensor 2
Sensor 3
113(1)
113(2)
113(3)

FIG.2

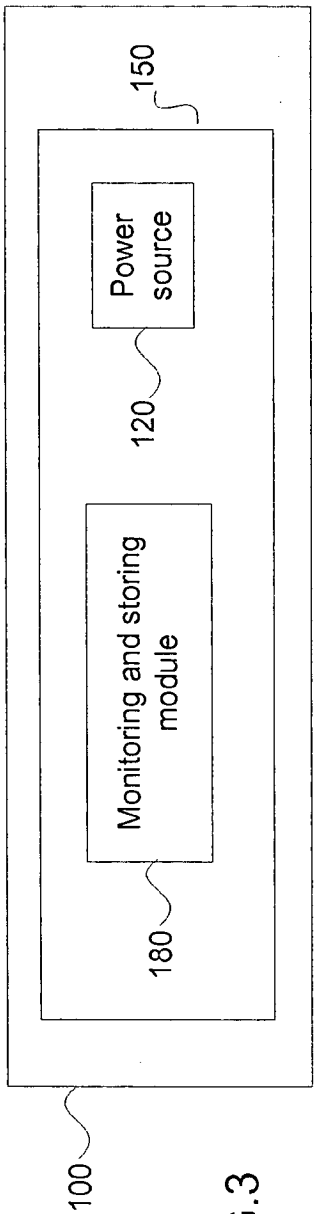
150
Power source
120
Monitoring and storing module
180
100

FIG.3

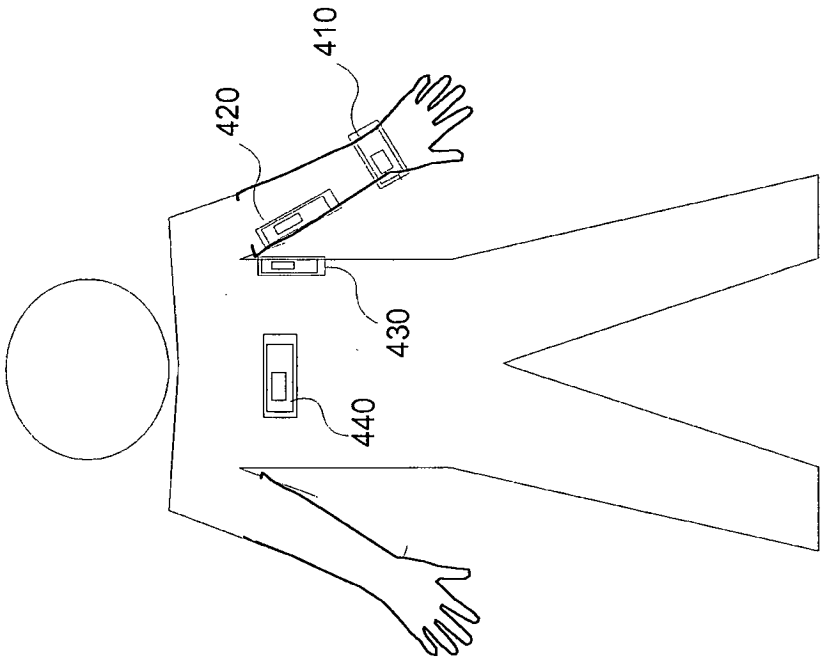
410
420
430
440

FIG.4

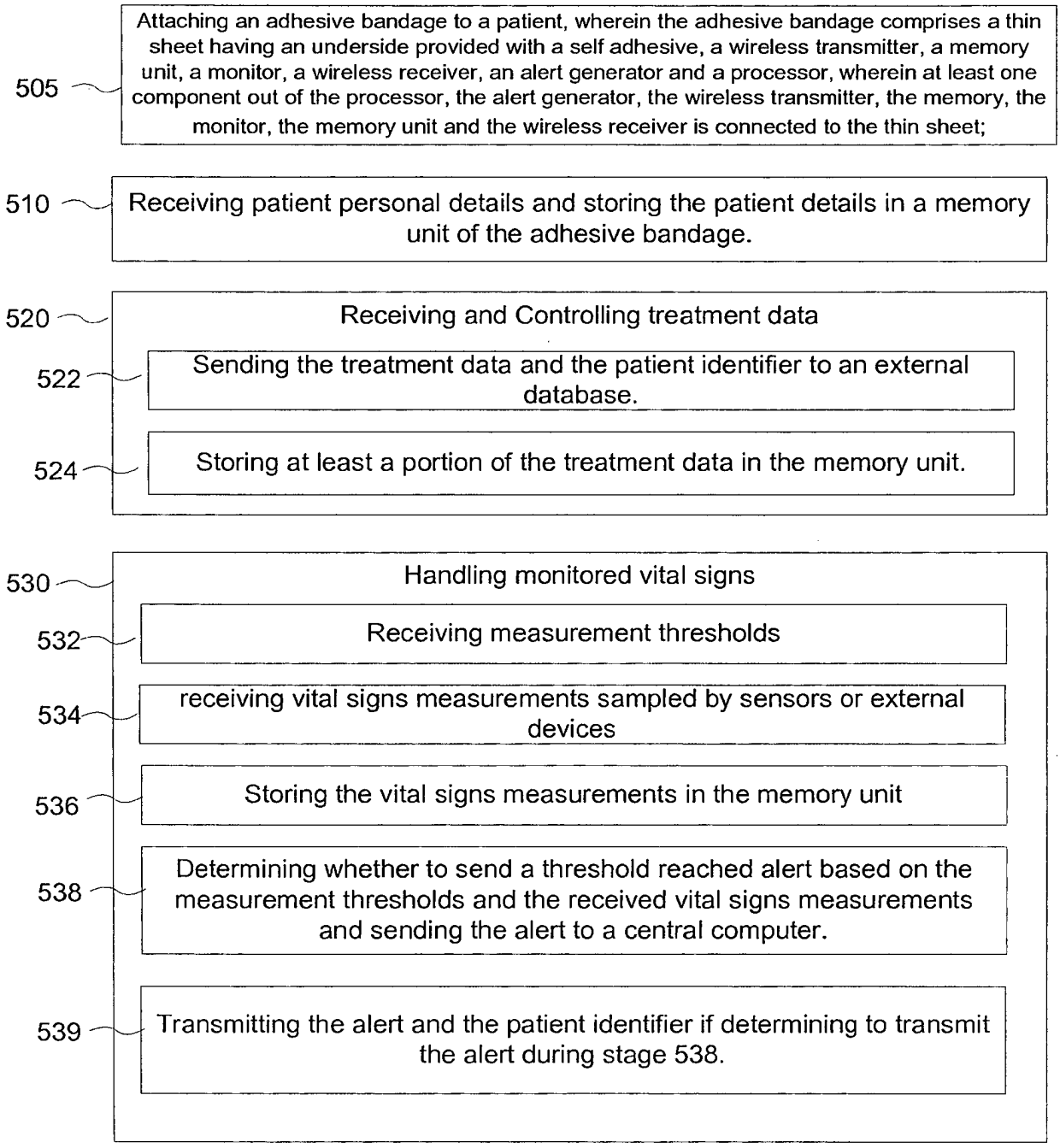
505
Attaching an adhesive bandage to a patient, wherein the adhesive bandage comprises a thin sheet having an underside provided with a self adhesive, a wireless transmitter, a memory unit, a monitor, a wireless receiver, an alert generator and a processor, wherein at least one component out of the processor, the alert generator, the wireless transmitter, the memory, the monitor, the memory unit and the wireless receiver is connected to the thin sheet;
510
Receiving patient personal details and storing the patient details in a memory unit of the adhesive bandage.
520
Receiving and Controlling treatment data
522
Sending the treatment data and the patient identifier to an external database.
524
Storing at least a portion of the treatment data in the memory unit.
530
Handling monitored vital signs
532
Receiving measurement thresholds
534
receiving vital signs measurements sampled by sensors or external devices
536
Storing the vital signs measurements in the memory unit
538
Determining whether to send a threshold reached alert based on the measurement thresholds and the received vital signs measurements and sending the alert to a central computer.
539
Transmitting the alert and the patient identifier if determining to transmit the alert during stage 538.

FIG.5

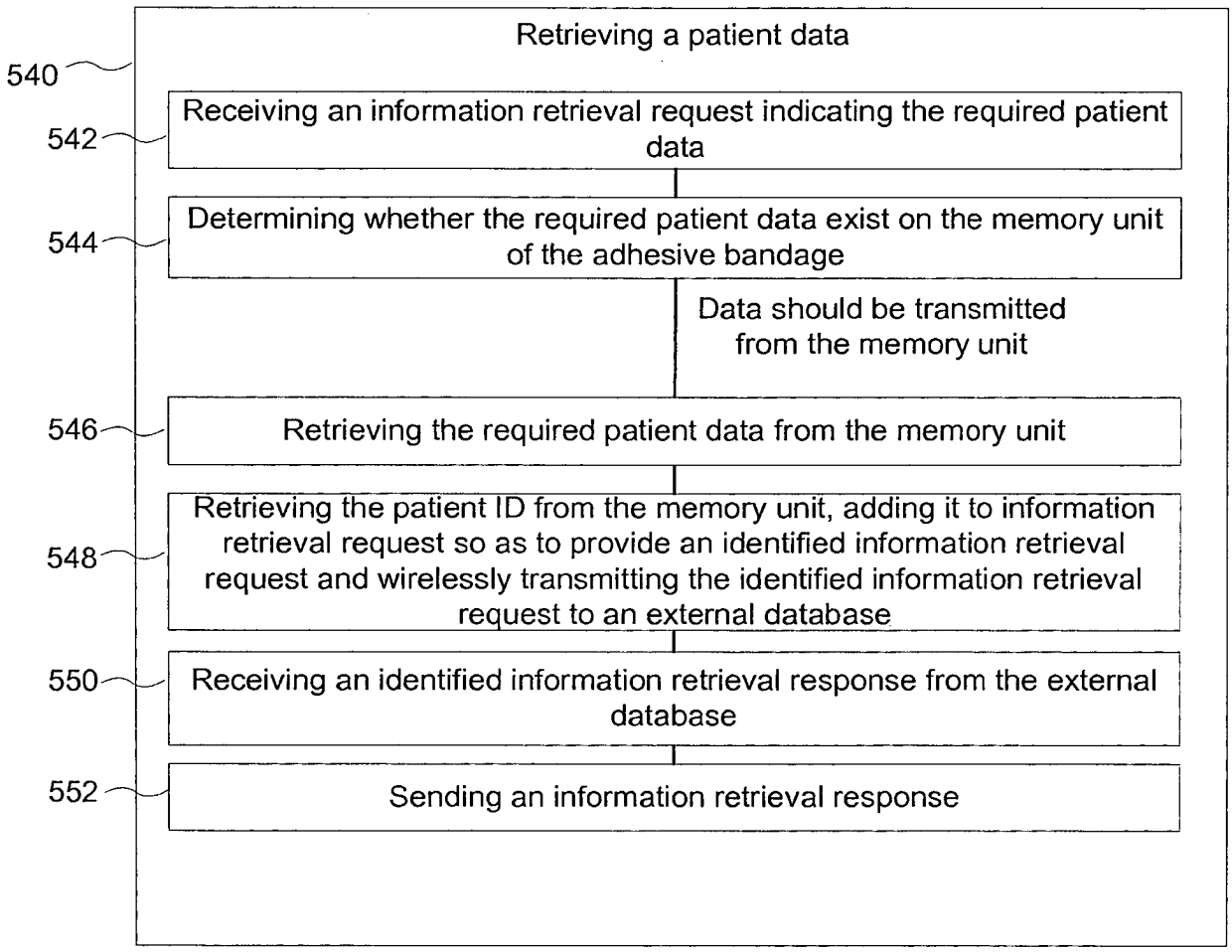
Retrieving a patient data
540
Receiving an information retrieval request indicating the required patient data
542
Determining whether the required patient data exist on the memory unit of the adhesive bandage
544
Data should be transmitted from the memory unit
Retrieving the required patient data from the memory unit
546
Retrieving the patient ID from the memory unit, adding it to information retrieval request so as to provide an identified information retrieval request and wirelessly transmitting the identified information retrieval request to an external database
548
Receiving an identified information retrieval response from the external database
550
Sending an information retrieval response
552

FIG.6

REFERENCES CITED IN THE DESCRIPTION

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专利名称(译)	粘性绷带和控制患者信息的方法		
公开(公告)号	EP3210580B1	公开(公告)日	2020-05-06
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[标]申请(专利权)人(译)	卡式监控科学保健有限公司		
申请(专利权)人(译)	CARD GUARD科技有限公司生存.		
当前申请(专利权)人(译)	CARD GUARD科技有限公司生存.		
[标]发明人	NIR GEVA		
发明人	NIR, GEVA		
IPC分类号	A61F13/00 A61B5/00 G06F13/34 A61F13/02 G16H10/60		
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代理机构(译)	·冯·STOSCH，ANDREAS		
优先权	PCT/IB2011/050193 2011-01-17 WO 61/293723 2010-01-11 US		
其他公开文献	EP3210580A1		
外部链接	Espacenet		

摘要(译)

一种粘合绷带，包括：薄板，该薄板的下侧具有自粘剂； 无线发射机； 存储器单元，耦合到无线发射机，用于存储患者标识符并用于存储包括测量阈值，生命体征测量值和治疗数据的患者数据； 与存储单元相连的监测器，用于监测生命体征并产生生命体征测量值； 无线接收器，用于接收获取所请求的患者数据的请求； 警报产生器，耦接至存储单元，用于在生命体征测量值达到相关测量阈值时产生警报； 处理器，耦合到无线发射器，无线接收器和存储单元，用于确定是否通过无线发射器发送所请求的患者数据和患者标识符，以及用于确定是否通过无线发送 发送器，警报和患者标识符； 其中，处理器，警报生成器，无线发送器，存储器，监视器，存储单元和无线接收器中的至少一个组件连接至薄片。

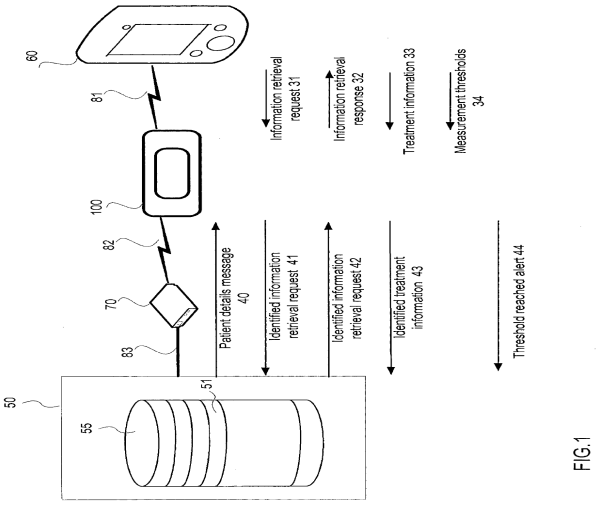

FIG.1