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(54) **ALARM CLOCK WITH BLOOD PRESSURE MONITORING**

WECKER MIT BLUTDRUCKÜBERWACHUNG

REVEIL AVEC SURVEILLANCE DE LA PRESSION SANGUINE

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Description

TECHNICAL FIELD

[0001] Embodiments of the present invention relate to the field of electronic products, and in particular, to a user reminding apparatus, and a terminal device.

BACKGROUND

[0002] Hypertension is one of the most common cardio-cerebral vascular diseases, and an increase in a blood pressure is closely associated with a cardio-cerebral vascular event such as myocardial infarction or cerebral apoplexy, and is an important hidden danger that affects human health.

[0003] When a person has a rest at night, a metabolism level is relatively low, and a blood pressure decreases accordingly. Once the person wakes up and gets up to perform an activity, the blood pressure rapidly increases. Duration from 6:00 to 10:00 in the morning is a peak period of a human blood pressure in one day, and a cardio-cerebral vascular event is extremely easily induced in this period because of hypertension.

[0004] To smoothly begin one day of life, a user generally sets an alarm in a terminal device, and when the terminal device determines that a current time reaches an alarm time, the alarm rings to prompt the user to get up. The duration from 6:00 to 10:00 in the morning is not only a peak period of a human blood pressure in one day, but also a time period during which most persons need to get up. A sleeping user may feel uncomfortable because of an alarm ringtone that suddenly rings, and may also experience an instantaneous blood pressure increase. Therefore, if a user suffering from hypertension is awakened by an alarm that suddenly rings, a relatively severe event may be induced.

[0005] Further, WO 2012/0180029A1 refers to a blood pressure measurement device for measuring blood pressure in 24-hour behavior monitoring, said blood pressure measurement device comprising: a cuff which is to be attached to the user's wrist or upper arm and compresses blood vessels in the wrist or upper arm; a blood pressure-measuring body for holding the cuff and being provided with a blood pressure-measuring means for measuring the maximal blood pressure and the minimal blood pressure; a blood pressure-analyzing means for analyzing signals transmitted from the blood pressure-measuring means and converting the same into arterial waves in the 24-hour behavior monitoring; and a display for displaying the data transmitted from the blood pressure-analyzing means. The blood pressure measurement device is characterized in that said blood pressure-analyzing means is provided with a blood pressure measurement-setting means for setting blood pressure-measuring points in the 24-hour behavior monitoring and controlling the blood pressure-measuring means at the thus set points, an agenda-setting means for setting the contents of the user's daily behaviors, and an agenda-displaying means for relating the blood pressure-measuring points to the contents of the user's daily behaviors and displaying the thus obtained data, together with the arterial waves, in the display.

[0006] Further, US 2006/0200011 A1 refers to a health management apparatus including a first pulse wave measuring unit that measures a first pulse wave of a subject during sleep, and a second pulse wave measuring unit that measures a second pulse wave of the subject during sleep. The second pulse wave is different from the first pulse wave in propagation time from the heart of the subject. The apparatus also includes a pulse transmission time calculating unit that calculates a pulse transmission time indicating a time difference between the first and second pulse waves; a pulse interval calculating unit that calculates a pulse interval based on at least one of the first and second pulse waves; an autonomic nerve index calculating unit that calculates an autonomic nerve index based on the pulse transmission time and the pulse interval; and a health determining unit that determines the condition of health of the subject based on the autonomic nerve index.

[0007] Further, JP 2007325613A1 refers to a electronic blood pressure monitor including a cuff mounted on an appropriate place of an auricle of an ear, a pressurizing means for pressurizing the cuff, a depressurizing-speed controlling means for controlling a depressurizing speed of inner pressure of the cuff, a pressure detecting means for detecting inner pressure of the cuff, a pressure determining means for determining the maximum blood pressure value (a systolic blood pressure value) and the minimal blood pressure value (a diastolic blood pressure value) based on output signals of the pressure detecting means during a process of depressurizing the inner pressure of the cuff, and a blood pressure measurement time setting means. The time set by the blood pressure measurement time setting means is set for a prescribed time before wake-up time to be set, and the pressurizing means pressurizes the cuff at 2-5 mmHg per second

SUMMARY

[0008] In view of this, embodiments of the present invention provide a user reminding apparatus, and a terminal device, so as to avoid a hidden safety danger caused when a sleeping user whose blood pressure increases is suddenly awakened.

[0009] The invention is defined by the independent claims. Preferred embodiments are defined by the dependent

claims.

[0010] By means of the foregoing solutions, a safety level of a user is determined according to a physical status and a blood pressure value of the user, and a corresponding reminding manner is customized for the user according to the safety level, thereby avoiding a health risk of the user caused because of a blood pressure change, reducing a blood pressure burden on the user, and then improving safety and comfortableness of ordinary users and hypertension patients who get up in the morning.

BRIEF DESCRIPTION OF DRAWINGS

[0011]

FIG. 1 is a flowchart of a user reminding method;
FIG. 2 is a flowchart of another user reminding method;
FIG. 3 is a schematic diagram of a user reminding apparatus according to an embodiment of the present invention;
FIG. 4 is a schematic diagram of another user reminding apparatus according to an embodiment of the present invention;
FIG. 5 is a schematic diagram of another user reminding apparatus according to an embodiment of the present invention; and
FIG. 6 is a schematic diagram of a terminal device.

DESCRIPTION OF EMBODIMENTS

[0012] The following clearly and completely describes the technical solutions in the embodiments of the present invention with reference to the accompanying drawings in the embodiments of the present invention. Apparently, the described embodiments are merely some but not all of the embodiments of the present invention which defined by the independent claims. Preferred embodiments are defined by the dependent claims.

[0013] FIG. 1 is a flowchart of a user reminding method. As shown in FIG. 1, the method includes the following steps.

[0014] Step 101: When a time difference between a current time and a preset reminding time is less than a first threshold, a terminal device obtains a physical status of a user and a first blood pressure value of the user.

[0015] A time amount of advance, that is, the first threshold is set on the terminal device. When the terminal device determines that the time difference between the current time and the preset reminding time is less than the first threshold, it may be determined that an alarm is to ring, and then the terminal device obtains the physical status and the first blood pressure value of the user.

[0016] The first threshold is a time length greater than or equal to a time needed to obtain the physical status and the first blood pressure value of the user, and is, for example, 1 minute, 2 minutes, or another value. The first threshold may be set according to an actual requirement. Certainly, if the first threshold satisfies the foregoing condition, a smaller value of the first threshold indicates that the current time is closer to the preset reminding time, and the physical status and the first blood pressure value that are obtained are greater reference.

[0017] In this method for example, the physical status of the user may be obtained by using an electrocardiosignal collection apparatus or a pulse wave signal detection apparatus. For example, an electrocardiosignal of the user is detected by using an electrocardiography sensor, and the physical status of the user is determined according to a heart rate and a heart rate variability; a pulse wave period is measured by using an optical sensor, a pressure sensor, an acoustic sensor, a photoelectric sensor, an acceleration sensor, a displacement sensor, or the like, and the physical status is determined according to a change in the pulse wave period. Certainly, as long as apparatuses can obtain the physical status of the user, the apparatuses may be used in this embodiment of the present invention, and are not enumerated again herein.

[0018] In this method, the physical status includes, for example, an awake state and a sleeping state. The sleeping state may include, for example, a falling asleep period, a shallow sleep period, a deep sleep period, and a rapid eye movement sleep period, and sleep depths of the falling asleep period, the shallow sleep period, and the deep sleep period are sequentially deepened.

[0019] In this method, for example, the first blood pressure value of the user may be obtained according to results of the electrocardiosignal collection apparatus and the pulse wave signal detection apparatus. For example, an electrocardiosignal of the user is obtained by using the electrocardiosignal collection apparatus, a pulse wave signal of the user is obtained by using the pulse wave signal detection apparatus, a pulse wave transmission time is calculated according to a time interval between a reference point on the electrocardiosignal and a reference point on the pulse wave signal in a same heartbeat period. Because a pulse wave transmission speed is inversely proportional to the pulse wave transmission time, a blood pressure value is calculated according to a relationship between an arterial blood pressure and a pulse wave transmission speed.

[0020] For a person of ordinary skill in the art, to calculate a blood pressure value by using an electrocardiosignal and a pulse wave signal is an existing commonly known technology, and how to perform calculation to obtain a blood pressure value may be very easily learned by using an existing reference document. Therefore, details are not described.

[0021] Step 102: Determine a first safety level based on the physical status and the first blood pressure value.

[0022] A safety level of the user, that is, the first safety level is determined according to the physical status and the first blood pressure value of the user that are obtained in step 101.

[0023] A person has different blood pressure values in the awake state and the sleeping state, the person has a relatively low blood pressure value in the sleeping state, and once the person is awake, the blood pressure increases. If the person already has a relatively high blood pressure value in the sleeping state, a risk of inducing a health event due to hypertension exists. Moreover, a deeper sleeping state of the person indicates a lower blood pressure, and if a blood pressure value of the person in a relatively deep sleeping state already reaches a hypertension limit in the awake state, it indicates that a hypertension risk of the person is also higher. Therefore, in this method, a correspondence is set between different physical statuses and blood pressure values, and corresponding safety levels are set. When a physical status is a rapid eye movement sleep period, physiological characteristics of the person are unstable, and blood pressure fluctuation is relatively large. Therefore, reference value of a blood pressure value of the user in the rapid eye movement sleep period is unobvious, and a safety level is determined with reference to a blood pressure value obtained when the physical status is the awake state.

[0024] Blood pressure values corresponding to different grades of the first safety level may be adjusted, for example, according to an actual requirement of the user, or may be preset by a system.

[0025] For example, for a correspondence among a first safety level, a physical status, and a blood pressure value refer to Table 1 (all blood pressure values in Table 1 are preset by the system, and have a unit of mmHg):

Table 1

Physical status / Blood pressure level	First safety level	Awake state or rapid eye movement sleep period		Falling asleep period		Shallow sleep period		Deep sleep period	
		Systolic blood pressure	Diastolic blood pressure	Systolic blood pressure	Diastolic blood pressure	Systolic blood pressure	Systolic blood pressure	Systolic blood pressure	Diastolic blood pressure
Normal	0	<140	<90	<135	<85	<130	<80	<100	<70
Mild hypertension	1	≥140, <160	≥90, <100	≥135, <155	≥85, <95	≥130, <150	≥80, <90	≥120, <140	≥70, <80
Moderate hypertension	2	≥160, <180	≥100, <110	≥155, <175	≥95, <105	≥150, <170	≥90, <100	≥140, <160	≥80, <90
Severe hypertension	3	≥180	≥110	≥175	≥105	≥170	≥100	≥160	≥90

[0026] For ease of description, when each of a blood pressure value, a diastolic blood pressure, and a systolic blood pressure is mentioned below, a unit of mmHg is omitted.

[0027] For example, referring to Table 1, when the obtained physical status of the user is the shallow sleep period in the sleeping state, and a systolic blood pressure is 135 and a diastolic blood pressure is 86 in the obtained first blood pressure value of the user, the foregoing table is searched based on the physical status and the first blood pressure value, to determine that the first safety level of the user is 1, that is, the user has mild hypertension.

[0028] Further, optionally, when a systolic blood pressure and a diastolic blood pressure belong to different blood pressure levels respectively, a higher one of blood pressure levels of the systolic blood pressure and the diastolic blood pressure is used as a standard for determining the first safety level.

[0029] For example, when the obtained physical status of the user is the shallow sleep period in the sleeping state, a systolic blood pressure is 135, and a diastolic blood pressure is 95, because the diastolic blood pressure corresponds to a higher blood pressure level, it is determined, according to that the diastolic blood pressure is 95, that the first safety level of the user is 2, that is, the user has moderate hypertension.

[0030] Step 103: Send a first reminding signal in a manner corresponding to the first safety level.

[0031] Users at different grades in the first safety level have different external environment requirements. For a user who is already awake, a blood pressure status of the user and a behavior of the user after the user gets up need to be learned. For a user who is sleeping, if the user has no hypertension history, even if the user is suddenly awakened, a blood pressure of the user does not increase. However, for a user who has a hypertension history or is in a hypertension state, if the user is awakened by an alarm ringtone that suddenly rings, a temporary disorder of nerves and endocrine is caused, and a blood pressure is further increased. For example, if a sleeping user having moderate hypertension suddenly hears ringing of an alarm ringtone and is awakened, a blood pressure value may increase, and reach a range of severe hypertension. Moreover, regardless of whether a hypertension emergency state or a hypertension crisis occurs in a hypertension patient, and regardless of whether an uncomfortable symptom occurs in the hypertension patient, as long as a systolic blood pressure exceeds 180 mmHg or a diastolic blood pressure exceeds 110 mmHg, antihypertensive therapy should be performed on the hypertension patient in time; otherwise, the life of the hypertension patient is probably endangered.

[0032] Therefore, in this method, the first reminding signal is sent in the manner corresponding to the first safety level. In this way, users at different grades in the first safety level receive different reminding signals sent by the terminal device, thereby improving comfortableness and safety of getting up in the morning.

[0033] In this method, a safety level of a user is determined according to a physical status and a blood pressure value of the user, and a corresponding reminding manner is customized for the user according to the safety level, thereby avoiding a health risk of the user caused because of a blood pressure change, reducing a blood pressure burden on the user, and then improving safety and comfortableness of ordinary users and hypertension patients who get up in the morning.

[0034] FIG. 2 is a schematic diagram of another user reminding method. On the basis of the user reminding method shown in FIG. 1, as shown in FIG. 2, the method includes the following steps.

[0035] Step 201: When a time difference between a current time and a preset reminding time is less than a first threshold, a terminal device obtains a physical status of a user and a first blood pressure value of the user; and when the physical status is a sleeping state, perform step 202; or when the physical status is an awake state, perform step 208.

[0036] Step 202: Determine a first safety level based on the sleeping state and the first blood pressure value, and send an awakening signal in a manner corresponding to the first safety level.

[0037] It should be noted that, the awakening signal includes but is not limited to: normal alarm ringing, soft ringing, or vibration.

[0038] The awakening signal may be preset, or may be selected by the user. For example, a health risk caused by hypertension to a user having chronic hypertension is larger than that caused by hypertension to a user having no hypertension history, and therefore, a user may adjust a systolic blood pressure value and a diastolic blood pressure value in Table 1 of the first safety level, and select a corresponding awakening signal.

[0039] In this method, the awakening signal may be preset, for example, in the following manners.

[0040] The first safety level is 0, and it indicates that a measured user has a normal blood pressure, and no hidden safety danger is caused because of an abnormal blood pressure. Therefore, the awakening signal is a normal alarm ringtone, and the user is awakened from sleep by using the normal alarm ringtone.

[0041] The first safety level is 1, and it indicates that a measured user has mild hypertension, and if the user is suddenly awakened by an alarm, the user feels uncomfortable, and has a relatively low risk. Therefore, the awakening signal is soft ringing, and the user is awakened from sleep by using soft and soothing music, thereby improving comfortableness of the awakened user.

[0042] The first safety level is 2, and it indicates that a measured user has moderate hypertension, and a blood pressure of the user may continue to increase because an alarm suddenly rings; not only the user feels uncomfortable, but also a health risk is induced. Therefore, the awakening signal is vibration, and the user is awakened from sleep by means of vibration, that is, an alarm ringtone is disabled, and a prompt of an alarm is perceived by using body or skin touch, so as to awaken the user, thereby avoiding a blood pressure increase caused because of scare, and improving safety and comfortableness of the user.

[0043] The first safety level is 3, and it indicates that a measured user has severe hypertension, and if the user is suddenly awakened by an alarm ringtone, there is a great risk of instantaneously increasing a blood pressure, and then endangering the life. Therefore, the terminal device sends no awakening signal, that is, an alarm is disabled. For example, the terminal device may send an instruction to an intelligent residential system, to adjust light in a bedroom, so as to naturally awaken the user, or notify a family of the user, and the user may be awakened from sleep with the help of the family.

[0044] Step 203: When the terminal device determines that the physical status of the user changes from the sleeping state to an awake state, obtain a second blood pressure value of the user in the awake state.

[0045] In step 202, after the terminal device sends a reminding signal, the user may be awakened. In this case, the terminal device may detect that the physical status of the user changes from the sleeping state to the awake state.

[0046] The second blood pressure value of the user in the awake state is obtained based on a manner the same as that of obtaining the first blood pressure value in step 101 in Embodiment 1, and details are not described herein again.

[0047] Step 204: Determine a second safety level based on a difference between the first blood pressure value and the second blood pressure value.

[0048] A change between blood pressure values of a user having no hypertension history in the sleeping state and the awake state is an approximate constant such as 10 to 20 mmHg. If a change between blood pressure values of a user in the sleeping state and the awake state exceeds this approximate constant, it indicates that a blood pressure of the user fluctuates relatively largely, and a health risk is induced because of hypertension.

[0049] The first blood pressure value is compared with the second blood pressure value, a blood pressure difference between systolic blood pressures of the first blood pressure value and the second blood pressure value and a blood pressure difference between diastolic blood pressures of the first blood pressure value and the second blood pressure value are separately determined, and the second safety level is determined according to a larger one of the blood pressure difference between the systolic blood pressures and the blood pressure difference between the diastolic blood pressures.

[0050] Blood pressure differences at safety levels may be adjusted, for example, according to an actual requirement of the user, or may be preset by a system.

[0051] For example, for a correspondence between a second safety level and a blood pressure difference in this method, refer to Table 2 (all blood pressure differences in Table 2 are preset by the system):

Table 2 s

Second safety level	Blood pressure difference mmHg
0	<20
1	≥20, <40
2	≥40, <60
3	≥60

[0052] For example, a physical status of a user is a shallow sleep period in a sleeping state, a systolic blood pressure of the obtained first blood pressure value is 135, and a diastolic blood pressure of the obtained first blood pressure value is 86. When it is determined that the physical status of the user changes from the sleeping state to an awake state, a systolic blood pressure of the obtained second blood pressure value is 145, and a diastolic blood pressure of the obtained second blood pressure value is 107. Therefore, when the physical status of the user changes from the sleeping state to the awake state, a difference between the systolic blood pressures is 10, and a difference between the diastolic blood pressures is 21. In this case, a larger value 21 of the difference between the systolic blood pressures and the difference between the diastolic blood pressures is selected, and Table 2 is searched to determine that the second safety level of the blood pressure of the awakened user is 1.

[0053] Step 205: Send a second reminding signal in a manner corresponding to the second safety level.

[0054] According to step 204, after the second safety level of the user is determined, the second reminding signal is sent in the manner corresponding to the second safety level.

[0055] A higher second safety level indicates a larger blood pressure change, and a higher health risk caused by the blood pressure change. Therefore, when the second reminding signal is sent in a manner corresponding to a different second safety level, it can be ensured that the user does not suddenly get up without being informed, which aggravates a blood pressure burden, and causes a health risk.

[0056] Further, in this method, the second reminding signal is a prompt signal.

[0057] It should be noted that, the prompt signal involved in this method includes but is not limited to: a signal that prompts normal getting-up, a signal that prompts timely medicine taking, a signal that prompts slow getting-up, a signal that prompts still lying, or a signal that prompts help seeking.

[0058] The second reminding signal sent in the manner corresponding to the second safety level in Table 2 may be, for example, preset on the following manner.

[0059] The second safety level is 0, and it indicates that a blood pressure of a measured user fluctuates normally, and no hidden safety danger is caused because of an abnormal blood pressure. Therefore, the prompt signal is, for example, a simple speech prompt such as "healthy" or "not bad today", to remind the user that the user may normally get up, and certainly, there may be no reminding.

[0060] The second safety level is 1, and it indicates that a blood pressure of a measured user fluctuates slightly highly, there is a potential risk of hypertension, and attention should be paid to a blood pressure change. Therefore, the prompt signal is, for example, a message pushed to a mobile phone or a wearable device in a form of speech or text such as

"blood pressure is slightly high, and please pay attention ", or "take medicine in time ", to remind the user to get up normally and take medicine in time, thereby improving a health index of the user.

[0061] Further, when it is determined that the second safety level is 1, while sending the prompt signal, the terminal device or a wearable device may further directly set a medicine taking time, that is, set a second threshold, thereby reminding the user to take medicine at a time after the second threshold starting from a current time, to control a blood pressure, so as to prevent the user from delaying an illness status due to forgetting to take medicine.

[0062] The second safety level is 2, and it indicates that a blood pressure of a measured user fluctuates relatively largely, and direct getting-up may cause the body to feel uncomfortable. Therefore, the prompt signal is, for example, a message pushed to a mobile phone or a wearable device in a form of speech or text such as "blood pressure is relatively high, and please get up slowly and take medicine on time", "blood pressure is relatively high, and please lie still and take medicine on time ", or "please not act violently and take medicine on time ", to remind the user to get up slowly, or to lie still in a bed for a period of time and then get up slowly, or not to act violently after getting up, and take medicine on time, or see a doctor at once if necessary, thereby improving vigilance of the user, and paying attention to a blood pressure change in real time.

[0063] Further, optionally, when it is determined that the second safety level is 2, in a period when a user lies still according to reminding of the terminal device, the second blood pressure value of the user at the time of waking up is detected continuously at a fixed interval, and when it is determined that a blood pressure difference between the second blood pressure value and the first blood pressure value of the user decreases and falls within a range corresponding to the second safety level being 1, the user is reminded in a reminding manner of the second safety level being 1, to get up and take medicine.

[0064] The second safety level is 3, and it indicates that blood pressure fluctuation of a measured user exceeds a limit, and direct getting-up has a high health risk. Therefore, the prompt signal is, for example, reminding the user of "blood pressure is very high, and please lie still" by using speech, to remind the user not to get up, and send help seeking information to a family or a doctor.

[0065] Further, optionally, when it is determined that the second safety level is 3, in a period when a user lies still according to reminding of the terminal device, the second blood pressure value of the user at the time of waking up is monitored continuously at a fixed interval, and when it is determined that a blood pressure difference between the second blood pressure value and the first blood pressure value of the user decreases to another second safety level, the user is reminded in a prompt manner of the another second safety level.

[0066] Further, optionally, in this embodiment of the present invention, after step 201 to step 204, step 205 is not performed, but instead, step 206 and step 207 are directly performed.

[0067] Step 206: Determine a third safety level based on the second blood pressure value of the user in the awake state. The third safety level may be determined with reference to, for example, a medical standard blood pressure value. Refer to Table 3.

Table 3

Blood pressure level	Third safety level	Blood pressure range mmHg	
Normal	0	systolic blood pressure< 140	diastolic blood pressure<90
Mild hypertension	1	140≤systolic blood pressure<159	90<diastolic blood pressure<99
Moderate hypertension	2	160≤systolic blood pressure<179	100<diastolic blood pressure<109
Severe hypertension	3	systolic blood pressure≥180	diastolic blood pressure≥110

[0068] Step 207: Select a higher safety level from the second safety level and the third safety level, and send a third reminding signal in a manner corresponding to the higher safety level. After step 207, the embodiment provided in the method ends.

[0069] For example, when the second safety level corresponding to the blood pressure difference between the second blood pressure value and the first blood pressure value of the user is 2, and the third safety level corresponding to the second blood pressure value of the user is 1, the third reminding signal is sent in a manner corresponding to the higher second safety level being 2.

[0070] It should be noted that, in this method, the third reminding signal may be the same as the second reminding signal, that is, the third reminding signal is also a prompt signal.

[0071] Step 208: Determine a first safety level based on the awake state and the first blood pressure value, and send a prompt signal in a manner corresponding to the first safety level.

[0072] The prompt signal may be the same as the second reminding signal or the third reminding signal, and includes but is not limited to: a signal that prompts normal getting-up, a signal that prompts timely medicine taking, a signal that

prompts slow getting-up, a signal that prompts still lying, or a signal that prompts help seeking.

[0073] According to this method, a safety level of a user is determined according to a physical status and a blood pressure value of the user, a corresponding reminding manner is customized for the user according to the safety level, and a reminding manner after awaking is further provided for a case in which the physical status is a sleeping state, so as to ensure safety of the user when the user gets up in the morning, and reduce a health risk.

[0074] An embodiment of the present invention further provides a user reminding apparatus for implementing steps and methods in the foregoing described methods.

[0075] FIG. 3 is a schematic diagram of a user reminding apparatus according to an embodiment of the present invention. As shown in FIG. 3, the apparatus 300 includes: a physical status obtaining unit 301, a first blood pressure obtaining unit 302, a first determining unit 303, and a first reminding unit 304.

[0076] The physical status obtaining unit 301 is configured to: when a time difference between a current time and a preset reminding time is less than a first threshold, obtain a physical status of a user.

[0077] The first blood pressure obtaining unit 302 is configured to: when the time difference between the current time and the preset reminding time is less than the first threshold, obtain a first blood pressure value of the user.

[0078] The first determining unit 303 is configured to determine a first safety level based on the physical status obtained by the physical status obtaining unit and the first blood pressure value obtained by the first blood pressure obtaining unit.

[0079] The first reminding unit 304 is configured to send a first reminding signal in a manner corresponding to the first safety level determined by the first determining unit.

[0080] In this embodiment of the present invention, a safety level of a user is determined according to a physical status and a blood pressure value of the user, and a corresponding reminding manner is customized for the user according to the safety level, thereby avoiding a health risk of the user caused because of a blood pressure change, reducing a blood pressure burden on the user, and then improving safety and comfortableness of ordinary users and hypertension patients who get up in the morning.

[0081] The user reminding apparatus provided in this embodiment of the present invention is configured to implement the methods shown in the embodiments shown in FIG. 1 and FIG. 2. For details of an operating principle and an operating process of the user reminding apparatus and a technical effect generated by the user reminding apparatus, refer to the embodiments shown in FIG. 1 and FIG. 2, and details are not described herein again.

[0082] FIG. 4 is a schematic diagram of another user reminding apparatus according to an embodiment of the present invention. On the basis of Embodiment 3 shown in FIG. 3, as shown in FIG. 4, the apparatus 400 includes:

a physical status obtaining unit 401, configured to: when a time difference between a current time and a preset reminding time is less than a first threshold, obtain that a physical status of a user is a sleeping state;
a first reminding unit 402, configured to send an awakening signal in a manner corresponding to the first safety level determined by the first determining unit, where
the physical status determining unit 401 is further configured to: after the first reminding unit sends the awakening signal, determine that the physical status of the user changes from the sleeping state to an awake state;
a second blood pressure obtaining unit 403, configured to obtain a second blood pressure value of the user in the awake state;
a second determining unit 404, configured to determine a second safety level based on a difference between the first blood pressure value and the second blood pressure value; and
a second reminding unit 405, configured to send a second reminding signal in a manner corresponding to the second safety level determined by the second determining unit 404.

[0083] It should be noted that, the second reminding signal may be, for example, a prompt signal, and the prompt signal includes but is not limited to: a signal that prompts normal getting-up, a signal that prompts timely medicine taking, a signal that prompts slow getting-up, a signal that prompts still lying, or a signal that prompts help seeking.

[0084] Further, optionally, in a case in which the foregoing units 401 to 404 in this embodiment of the present invention are included, the second reminding unit 405 may not be included, but instead, a third determining unit 406 and a third reminding unit 407 are included.

[0085] The third determining unit 406 is configured to determine a third safety level based on the second blood pressure value obtained by the second blood pressure obtaining unit.

[0086] The third reminding unit 407 is configured to select a higher safety level from the second safety level and the third safety level, and send a third reminding signal in a manner corresponding to the higher safety level.

[0087] It should be noted that, the third reminding signal may be the same as the second reminding signal, and is, for example, a prompt signal.

[0088] In this embodiment of the present invention, it is determined, according to a blood pressure difference between a first blood pressure value of a user in a sleeping state and a second blood pressure value of the user whose status changes from the sleeping state to an awake state, whether the user has a health risk caused by hypertension, and the

user is reminded, by using different reminders, of sitting-up manners that the user may use, thereby further ensuring safety of the user getting up in the morning, and reducing a health risk.

[0089] The user reminding apparatus provided in this embodiment of the present invention is configured to implement the methods shown in the embodiments shown in FIG. 1 and FIG. 2. For details of an operating principle and an operating process of the user reminding apparatus and a technical effect generated by the user reminding apparatus, refer to the embodiments shown in FIG. 1 and FIG. 2, and details are not described herein again.

[0090] FIG. 5 shows another user reminding apparatus according to an embodiment of the present invention. On the basis of the embodiment shown in FIG. 3, as shown in FIG. 5, the apparatus includes:

a physical status obtaining unit 501, configured to: when a time difference between a current time and a preset reminding time is less than a first threshold, obtain that a physical status of a user is an awake state; and
a first reminding unit 502, configured to: when the physical status of the user obtained by the physical status obtaining unit is an awake state, send a prompt signal in the manner corresponding to the first safety level.

[0091] In this embodiment of the present invention, a first blood pressure value is obtained when a physical status of a user is an awake state, a first safety level is determined according to the awake state and the first blood pressure value, and a signal reminding the user of a sitting-up manner is sent in a manner corresponding to the first safety level, thereby ensuring safety of the user getting up in the morning, and reducing a health risk.

[0092] The user reminding apparatus provided in this embodiment of the present invention is configured to implement the methods shown in the embodiments shown in FIG. 1 and FIG. 2. For details of an operating principle and an operating process of the user reminding apparatus and a technical effect generated by the user reminding apparatus, refer to the embodiments shown in FIG. 1 and FIG. 2, and details are not described herein again.

[0093] FIG. 6 is a schematic diagram of a terminal device according to an embodiment of the present invention.

[0094] The terminal device 600 in this embodiment of the present invention includes a processor 601 coupled to one or more storage devices, a storage device 602, a communications interface 603, and a bus 604.

[0095] The processor 601 is a control center of the terminal device 600 and provides sequencing and processing facilities to execute an instruction, perform an interrupt operation, and provide a timing function and many other functions. Optionally, the processor 601 includes one or more central processing units (CPU). Optionally, the terminal device 600 includes more than one processor. The processor 601 may be a single-core (single-CPU) processor or a multi-core (multi-CPU) processor. The term "processor" used in this specification refers to one or more devices, circuits, and/or processing kernels configured to process data such as a computer program instruction.

[0096] The storage device 602 may include a storage medium and a memory unit. The storage medium may be read-only such as a read-only memory (ROM), or be readable/writable such as a hard disk or flash memory. The memory unit may be a random access memory (RAM). The memory unit may be physically integrated together with the processor 601 or be integrated into the processor 601 or be constructed in one or more independent units.

[0097] The processor 601 may execute program code stored in the storage device 602. Optionally, the program code stored in the storage medium of the storage device 602 may be replicated into the memory unit, so as to be executed by the processor. The processor may execute at least one kernel (for example, a kernel in an operating system sold with a trademark such as LINUZTM, UNIX™, WINDOWS™, ANDROID™, or IOS™), and it is well known that the kernel is configured to control operations of the terminal device 600 by controlling execution of other programs or processes, controlling communication with a peripheral, and controlling use of resources of a computing device.

[0098] The terminal device 600 further includes the communications interface 603, configured to communicate with another device or system directly or by using an external network.

[0099] The foregoing elements of the terminal device 600 may be coupled to each other by using any one of or any combination of the bus 604 such as a data bus, an address bus, a control bus, an extended bus or a local bus.

[0100] Optionally, the terminal device 600 further includes an output device and an input device (not shown). The output device is coupled to the processor 601, and can display information in one or more manners. An example of the output device is a visual display device, for example, a crystal liquid display (LCD), a light emitting diode (LED) display, a cathode-ray tube (CRT), or a projector. The input device is also coupled to the processor 601, and can receive a user input of the terminal device 600 in one or more manners. An example of the input device includes a mouse, a keyboard, a touchscreen device, a sensing device, or the like.

[0101] The processor 601 reads the program code and data that are stored in the storage device 602, where the program code includes an instruction, and when executing the instruction, the processor performs the following operations:

when a time difference between a current time and a preset reminding time is less than a first threshold, obtaining a physical status of a user and a first blood pressure value of the user;
determining a first safety level based on the physical status and the first blood pressure value; and

sending a first reminding signal in a manner corresponding to the first safety level.

[0102] It should be noted that, when the terminal device 600 of this embodiment of the present invention is a wearable device, the wearable device includes an electrocardiosignal collection apparatus and a pulse wave signal collection apparatus, and the processor 601 controls the electrocardiosignal collection apparatus and the pulse wave signal collection apparatus to obtain an electrocardiosignal and a pulse wave signal, obtains the physical status according to the electrocardiosignal and/or the pulse wave signal, and obtains the first blood pressure value of the user according to the electrocardiosignal and the pulse wave signal. The processor 601 determines the first safety level based on the physical status and the first blood pressure value that are obtained, and sends the first reminding signal in the manner corresponding to the first safety level.

[0103] Optionally, when the terminal device 600 of this embodiment of the present invention is a general-purpose computing device or an application-specific computing device such as a desktop computer, a notebook computer, a network server, a personal digital assistant (PDA), a mobile phone, a tablet computer, a wireless terminal device, a telecommunications device, an embedded system or any other device that has a structure similar to that shown in FIG. 6, the processor 601 of the terminal device 600 needs to obtain a physical status and a blood pressure value of a user by using a wearable device including an electrocardiosignal collection apparatus and a pulse wave signal collection apparatus. That is, the processor 601 controls the electrocardiosignal collection apparatus and pulse wave signal collection apparatus in the wearable device to perform the operation of obtaining the physical status and the blood pressure value, and receives obtained data returned by the wearable device. The processor 601 determines the first safety level based on the physical status and the first blood pressure value that are obtained, and sends the first reminding signal in the manner corresponding to the first safety level.

[0104] Further, when the physical status is an awake state, the processor 601 sends a prompt signal in the manner corresponding to the first safety level.

[0105] It should be noted that, in this embodiment of the present invention, the prompt signal includes but is not limited to: a signal that prompts normal getting-up, a signal that prompts timely medicine taking, a signal that prompts slow getting-up, a signal that prompts still lying, or a signal that prompts help seeking.

[0106] Further, when the physical status is a sleeping state, the processor 601 sends an awakening signal in the manner corresponding to the first safety level.

[0107] It should be noted that, in this embodiment of the present invention, the awakening signal includes but is not limited to: normal alarm ringing, soft ringing, or vibration.

[0108] Further, after sending the awakening signal in the manner corresponding to the first safety level, the processor 601 further performs the following operations:

determining that the physical status of the user changes from the sleeping state to an awake state;
obtaining a second blood pressure value of the user in the awake state;
determining a second safety level based on a difference between the first blood pressure value and the second blood pressure value; and
sending a second reminding signal in a manner corresponding to the second safety level.

[0109] Further, after sending the awakening signal in the manner corresponding to the first safety level, the processor 601 further performs the following operations:

determining that the physical status of the user changes from the sleeping state to an awake state;
obtaining a second blood pressure value of the user in the awake state;
determining a second safety level based on a difference between the first blood pressure value and the second blood pressure value;
determining a third safety level based on the second blood pressure value; and
selecting a higher safety level from the second safety level and the third safety level, and sending a third reminding signal in a manner corresponding to the higher safety level.

[0110] It should be noted that, in this embodiment of the present invention, the second reminding signal or the third reminding signal is a prompt signal.

[0111] In this embodiment of the present invention, a safety level of a user is determined according to a physical status and a blood pressure value of the user, and a corresponding reminding manner is customized for the user according to the safety level, thereby avoiding a health risk of the user caused because of a blood pressure change, reducing a blood pressure burden on the user, and then improving safety and comfortableness of ordinary users and hypertension patients who get up in the morning.

[0112] The terminal device provided in this embodiment of the present invention is configured to implement the methods

shown in the embodiments shown in FIG. 1 and FIG. 2. For details of an operating principle and an operating process of the terminal device and a technical effect generated by the terminal device, refer to the embodiments shown in FIG. 1 and FIG. 2, and details are not described herein again.

[0113] With descriptions of the foregoing embodiments, a person skilled in the art may clearly understand that the present invention may be implemented by hardware, firmware or a combination thereof. When the present invention is implemented by software, the foregoing functions may be stored in a computer-readable medium or transmitted as one or more instructions or code in the computer-readable medium. The computer-readable medium includes a computer storage medium and a communications medium, where the communications medium includes any medium that enables a computer program to be transmitted from one place to another. The storage medium may be any available medium accessible to a computer. The following provides an example but does not impose a limitation: The computer-readable medium may include a RAM, a ROM, an EEPROM, a CD-ROM, or another optical disc storage or a disk storage medium, or another magnetic storage device, or any other medium that can carry or store expected program code in a form of an instruction or a data structure and can be accessed by a computer. In addition, any connection may be appropriately defined as a computer-readable medium. For example, if software is transmitted from a website, a server or another remote source by using a coaxial cable, an optical fiber/cable, a twisted pair, a digital subscriber line (DSL) or wireless technologies such as infrared ray, radio and microwave, the coaxial cable, optical fiber/cable, twisted pair, DSL or wireless technologies such as infrared ray, radio and microwave are included in fixation of a medium to which they belong. For example, a disk (Disk) and disc (disc) used by the present invention includes a compact disc (CD), a laser disc, an optical disc, a digital versatile disc (DVD), a floppy disk and a Blu-ray disc, where the disk generally copies data by a magnetic means, and the disc copies data optically by a laser means. The foregoing combination should also be included in the protection scope of the computer-readable medium.

[0114] In summary, what is described above is merely exemplary embodiments of the technical solutions of the present invention, but is not intended to limit the protection scope of the present invention which is defined by the independent claims. Preferred embodiments are defined by the dependent claims.

Claims

1. A user reminding apparatus being configured to:

a.) when a time difference between a current time and a preset reminding time is less than a first threshold, obtain a physical status of a user and a first blood pressure value comprising a systolic blood pressure and a diastolic blood pressure of the user (step 201),
b.) determine whether the obtained physical status is a sleeping state,
c.) if yes in step **b.),** determine a first safety level based on the sleeping state and the first blood pressure value (step 202),
d.) select and send a specific awakening signal in a manner corresponding to the first safety level (step 202),
e.) determine whether a state of the user changes from the sleeping state to an awake state,
f.) if yes in step **e.),** obtain a second blood pressure value comprising a systolic blood pressure and a diastolic blood pressure in the awake state of the user (step 203),
g.) determine a first blood pressure difference between the systolic blood pressure of the first blood pressure value and the systolic blood pressure of the second blood pressure value and a second blood pressure difference between the diastolic blood pressure of the first blood pressure value and the diastolic blood pressure of the second blood pressure value,
h.) determine a second safety level based on the larger one of the first blood pressure difference and the second blood pressure difference (step 204), and
i.) select and send a specific first prompt signal in a manner corresponding to the second safety level (step 205).

2. The user reminding apparatus according to claim 1, wherein said apparatus is configured to determine a third safety level based on the second blood pressure value; and select the higher safety level from the second safety level and the third safety level, select and send a second prompt signal in a manner corresponding to the higher safety level.

3. The user reminding apparatus according to claim 2, wherein
the awakening signal specifically comprises: normal ringing, soft ringing, or vibration; and
the first and second prompt signals specifically comprises: a signal that prompts normal getting-up, a signal that prompts timely medicine taking, a signal that prompts slow getting-up, a signal that prompts still lying, or a signal that prompts help seeking.

4. A computer-readable storage medium comprising instructions which, when executed by a computer, cause the computer to carry out the following steps:

a.) when a time difference between a current time and a preset reminding time is less than a first threshold, obtaining a physical status of a user and a first blood pressure value comprising a systolic blood pressure and a diastolic blood pressure of the user (step 201),
b.) determining whether the obtained physical status is a sleeping state,
c.) if yes in step **b.),** determining a first safety level based on the sleeping state and the first blood pressure value (step 202),
d.) selecting and sending a specific awakening signal in a manner corresponding to the first safety level (step 202),
e.) determining whether a state of the user changes from the sleeping state to an awake state,
f.) if yes in step **e.),** obtaining a second blood pressure value comprising a systolic blood pressure and a diastolic blood pressure in the awake state of the user (step 203),
g.) determining a first blood pressure difference between the systolic blood pressure of the first blood pressure value and the systolic blood pressure of the second blood pressure value and a second blood pressure difference between the diastolic blood pressure of the first blood pressure value and the diastolic blood pressure of the second blood pressure value,
h.) determining a second safety level based on the larger one of the first blood pressure difference and the second blood pressure difference (step 204), and
i.) selecting and sending a specific first prompt signal in a manner corresponding to the second safety level (step 205).

Patentansprüche

1. Benutzer-Erinnerungsvorrichtung, die für Folgendes ausgelegt ist:

a.) wenn eine Zeitdifferenz zwischen einer aktuellen Zeit und einer voreingestellten Erinnerungszeit kleiner als ein erster Schwellenwert ist, Erhalten eines körperlichen Zustands eines Benutzers und eines ersten Blutdruckwerts, der einen systolischen Blutdruck und einen diastolischen Blutdruck des Benutzers umfasst (Schritt 201),
b.) Bestimmen, ob der erhaltene körperliche Zustand ein Schlafzustand ist,
c.) wenn Ja in Schritt b.), Bestimmen einer ersten Sicherheitsstufe basierend auf dem Schlafzustand und dem ersten Blutdruckwert (Schritt 202),
d.) Auswählen und Senden eines bestimmten Wecksignals in einer Weise, die der ersten Sicherheitsstufe entspricht (Schritt 202),
e.) Bestimmen, ob ein Zustand des Benutzers vom Schlafzustand zu einem Wachzustand wechselt,
f.) wenn Ja in Schritt e.), Erhalten eines zweiten Blutdruckwerts, der einen systolischen Blutdruck und einen diastolischen Blutdruck im Wachzustand des Benutzers umfasst (Schritt 203).
g.) Bestimmen einer ersten Blutdruckdifferenz zwischen dem systolischen Blutdruck des ersten Blutdruckwerts und dem systolischen Blutdruck des zweiten Blutdruckwerts sowie einer zweiten Blutdruckdifferenz zwischen dem diastolischen Blutdruck des ersten Blutdruckwerts und dem diastolischen Blutdruck des zweiten Blutdruckwerts,
h.) Bestimmen einer zweiten Sicherheitsstufe basierend auf dem größeren Wert der ersten Blutdruckdifferenz und der zweiten Blutdruckdifferenz (Schritt 204), und
i.) Auswählen und Senden eines bestimmten ersten Aufforderungssignals in einer Weise, die der zweiten Sicherheitsstufe entspricht (Schritt 205).

2. Benutzer-Erinnerungsvorrichtung gemäß Anspruch 1, wobei die Vorrichtung dazu ausgelegt ist, eine dritte Sicherheitsstufe basierend auf dem zweiten Blutdruckwert zu bestimmen; und
die höhere Sicherheitsstufe von der zweiten Sicherheitsstufe und der dritten Sicherheitsstufe auszuwählen, sowie ein zweites Aufforderungssignal in einer Weise auszuwählen und zu senden, die der höheren Sicherheitsstufe entspricht.

3. Benutzer-Erinnerungsvorrichtung gemäß Anspruch 2, wobei das Wecksignal speziell Folgendes umfasst: normales Klingeln, leises Klingeln oder Vibration; und
das erste und zweite Aufforderungssignal speziell Folgendes umfasst: ein Signal, das zu normalem Aufstehen auffordert, ein Signal, das zu rechtzeitiger Arzneimitteleinnahme auffordert, ein Signal, das zu langsamem Aufstehen auffordert, ein Signal, das zu Stillliegen auffordert, oder ein Signal, das zu Hilfesuche auffordert.

4. Computerlesbares Speichermedium, das Anweisungen enthält, die, wenn sie von einem Computer ausgeführt werden, den Computer veranlassen, die folgenden Schritte auszuführen:

a.) wenn eine Zeitdifferenz zwischen einer aktuellen Zeit und einer voreingestellten Erinnerungszeit kleiner als ein erster Schwellenwert ist, Erhalten eines körperlichen Zustands eines Benutzers und eines ersten Blutdruckwerts, der einen systolischen Blutdruck und einen diastolischen Blutdruck des Benutzers umfasst (Schritt 201),
b.) Bestimmen, ob der erhaltene körperliche Zustand ein Schlafzustand ist,
c.) wenn Ja in Schritt b.), Bestimmen einer ersten Sicherheitsstufe basierend auf dem Schlafzustand und dem ersten Blutdruckwert (Schritt 202),
d.) Auswählen und Senden eines bestimmten Wecksignals in einer Weise, die der ersten Sicherheitsstufe entspricht (Schritt 202),
e.) Bestimmen, ob ein Zustand des Benutzers vom Schlafzustand zu einem Wachzustand wechselt,
f.) wenn Ja in Schritt e.), Erhalten eines zweiten Blutdruckwerts, der einen systolischen Blutdruck und einen diastolischen Blutdruck im Wachzustand des Benutzers umfasst (Schritt 203).
g.) Bestimmen einer ersten Blutdruckdifferenz zwischen dem systolischen Blutdruck des ersten Blutdruckwerts und dem systolischen Blutdruck des zweiten Blutdruckwerts sowie einer zweiten Blutdruckdifferenz zwischen dem diastolischen Blutdruck des ersten Blutdruckwerts und dem diastolischen Blutdruck des zweiten Blutdruckwerts,
h.) Bestimmen einer zweiten Sicherheitsstufe basierend auf dem größeren Wert der ersten Blutdruckdifferenz und der zweiten Blutdruckdifferenz (Schritt 204), und
i.) Auswählen und Senden eines bestimmten ersten Aufforderungssignals in einer Weise, die der zweiten Sicherheitsstufe entspricht (Schritt 205).

Revendications

1. Appareil de rappel d'utilisateur configuré pour :

a.) lorsqu'une différence de temps entre un temps actuel et un temps de rappel prédéfini est inférieure à un premier seuil, obtenir un état physique d'un utilisateur et une première valeur de pression sanguine comprenant une pression systolique et une pression diastolique de l'utilisateur (étape 201),
b.) déterminer si l'état physique obtenu est un état de sommeil ou non,
c.) si oui à l'étape b.), déterminer un premier niveau de sécurité en fonction de l'état de sommeil et de la première valeur de pression sanguine (étape 202),
d.) sélectionner et envoyer un signal de réveil spécifique d'une manière correspondant au premier niveau de sécurité (étape 202),
e.) déterminer si un état de l'utilisateur passe ou non de l'état de sommeil à un état d'éveil,
f.) si oui à l'étape e.), obtenir une deuxième valeur de pression sanguine comprenant une pression systolique et une pression diastolique dans l'état d'éveil de l'utilisateur (étape 203),
g.) déterminer une première différence de pression sanguine entre la pression systolique de la première valeur de pression sanguine et la pression systolique de la deuxième valeur de pression sanguine, et une deuxième différence de pression sanguine entre la pression diastolique de la première valeur de pression sanguine et la pression diastolique de la deuxième valeur de pression sanguine,
h.) déterminer un deuxième niveau de sécurité en fonction de la plus grande de la première différence de pression sanguine et de la deuxième différence de pression sanguine (étape 204), et
i.) sélectionner et envoyer un premier signal d'invite spécifique d'une manière correspondant au deuxième niveau de sécurité (étape 205).

2. Appareil de rappel d'utilisateur selon la revendication 1, ledit appareil étant configuré pour déterminer un troisième niveau de sécurité en fonction de la seconde valeur de pression sanguine ; et
sélectionner le niveau de sécurité supérieur à partir du deuxième niveau de sécurité et du troisième niveau de sécurité, sélectionner et envoyer un deuxième signal d'invite d'une manière correspondant au niveau de sécurité supérieur.

3. Appareil de rappel d'utilisateur selon la revendication 2,
le signal de réveil comprenant spécifiquement : une sonnerie normale, une sonnerie douce ou une vibration ; et
les premier et deuxième signaux d'invite comprenant spécifiquement : un signal qui invite à se lever normalement, un signal qui invite à prendre des médicaments en temps opportun, un signal qui invite à se lever lentement, un

signal qui invite à rester allongé, ou un signal qui invite à chercher de l'aide.

4. Support de stockage lisible par ordinateur comprenant des instructions qui, lorsqu'elles sont exécutées par un ordinateur, amènent l'ordinateur à réaliser les étapes suivantes :

a.) lorsqu'une différence de temps entre un temps actuel et un temps de rappel prédéfini est inférieure à un premier seuil, obtenir un état physique d'un utilisateur et une première valeur de pression sanguine comprenant une pression systolique et une pression diastolique de l'utilisateur (étape 201),
b.) déterminer si l'état physique obtenu est un état de sommeil ou non,
c.) si oui à l'étape b.), déterminer un premier niveau de sécurité en fonction de l'état de sommeil et de la première valeur de pression sanguine (étape 202),
d.) sélectionner et envoyer un signal de réveil spécifique d'une manière correspondant au premier niveau de sécurité (étape 202),
e.) déterminer si un état de l'utilisateur passe ou non de l'état de sommeil à un état d'éveil,
f.) si oui à l'étape e.), obtenir une seconde valeur de pression sanguine comprenant une pression systolique et une pression diastolique dans l'état d'éveil de l'utilisateur (étape 203),
g.) déterminer une première différence de pression sanguine entre la pression systolique de la première valeur de pression sanguine et la pression systolique de la deuxième valeur de pression sanguine, et une deuxième différence de pression sanguine entre la pression diastolique de la première valeur de pression sanguine et la pression diastolique de la deuxième valeur de pression sanguine,
h.) déterminer un deuxième niveau de sécurité en fonction de la plus grande de la première différence de pression sanguine et de la deuxième différence de pression sanguine (étape 204), et
i.) sélectionner et envoyer un premier signal d'invite spécifique d'une manière correspondant au deuxième niveau de sécurité (étape 205).

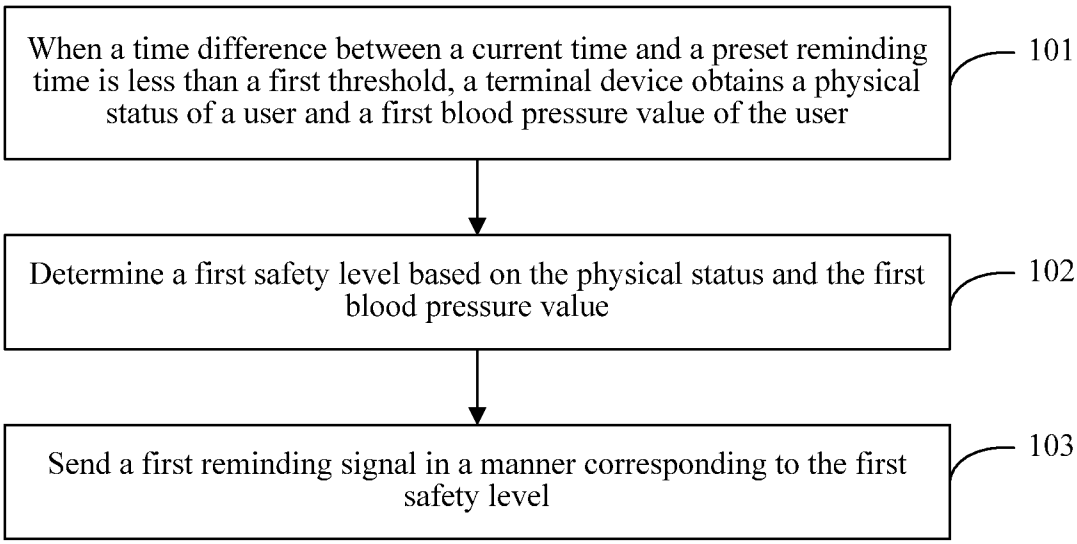
When a time difference between a current time and a preset reminding time is less than a first threshold, a terminal device obtains a physical status of a user and a first blood pressure value of the user
101
Determine a first safety level based on the physical status and the first blood pressure value
102
Send a first reminding signal in a manner corresponding to the first safety level
103

FIG. 1

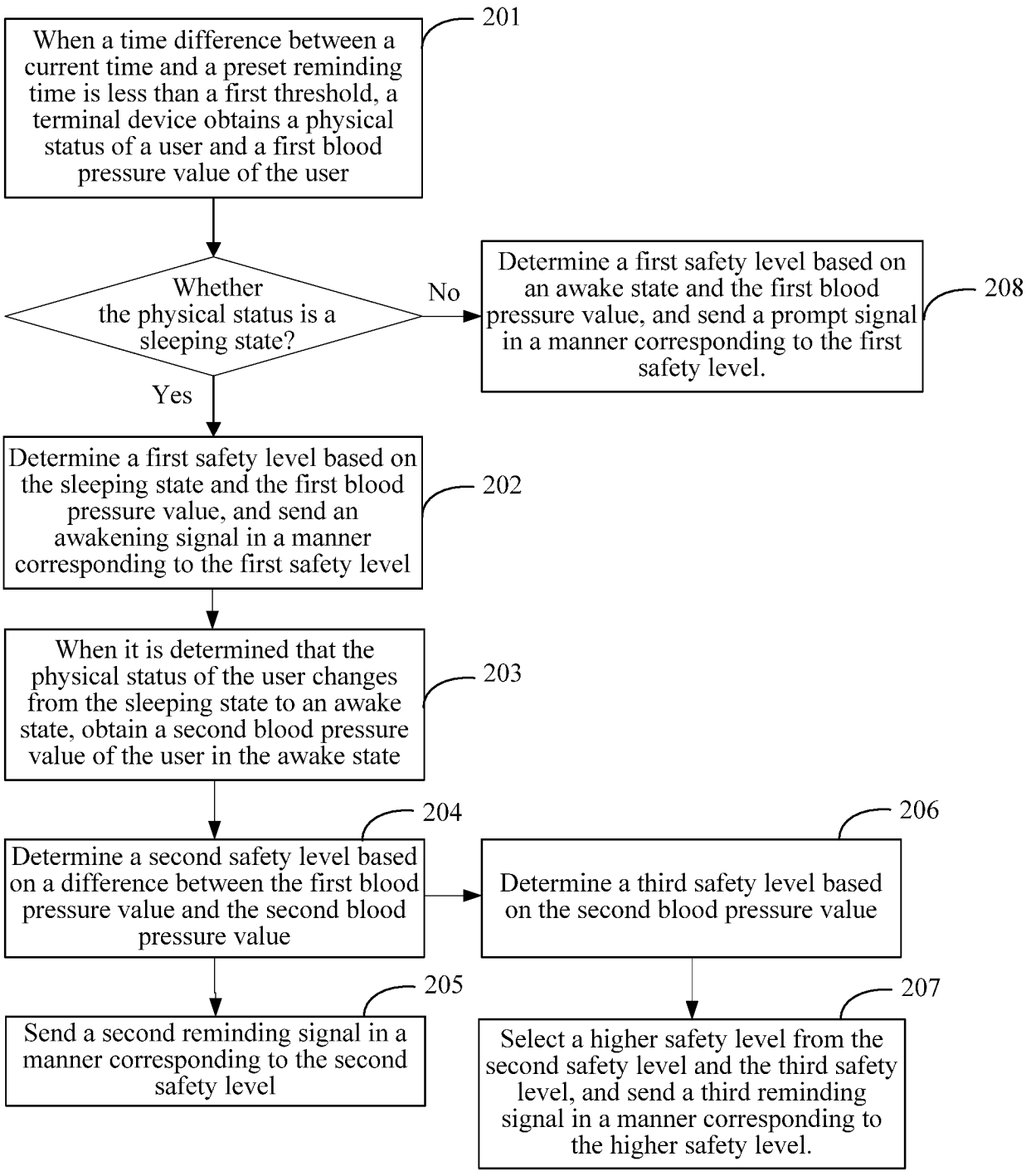
When a time difference between a current time and a preset reminding time is less than a first threshold, a terminal device obtains a physical status of a user and a first blood pressure value of the user
201
Whether the physical status is a sleeping state?
No
Determine a first safety level based on an awake state and the first blood pressure value, and send a prompt signal in a manner corresponding to the first safety level.
208
Yes
Determine a first safety level based on the sleeping state and the first blood pressure value, and send an awakening signal in a manner corresponding to the first safety level
202
When it is determined that the physical status of the user changes from the sleeping state to an awake state, obtain a second blood pressure value of the user in the awake state
203
204
Determine a second safety level based on a difference between the first blood pressure value and the second blood pressure value
206
Determine a third safety level based on the second blood pressure value
205
Send a second reminding signal in a manner corresponding to the second safety level
207
Select a higher safety level from the second safety level and the third safety level, and send a third reminding signal in a manner corresponding to the higher safety level.

FIG. 2

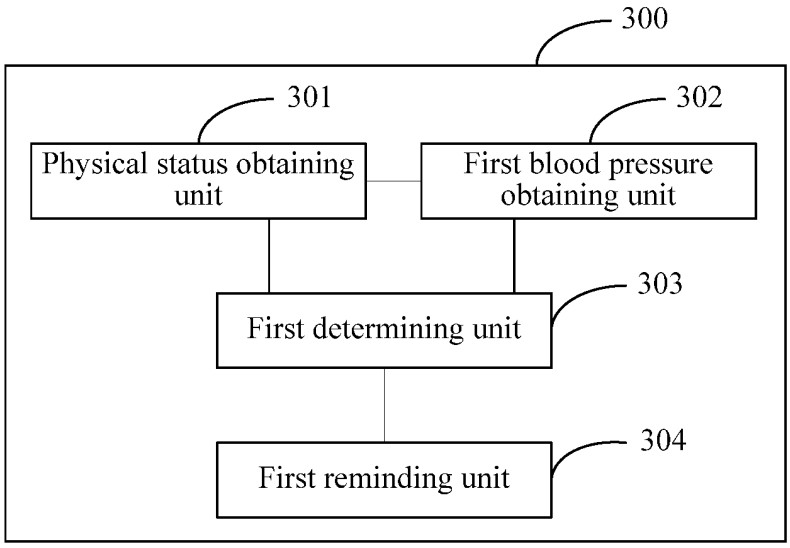
300
301
302
Physical status obtaining unit
First blood pressure obtaining unit
303
First determining unit
304
First reminding unit

FIG. 3

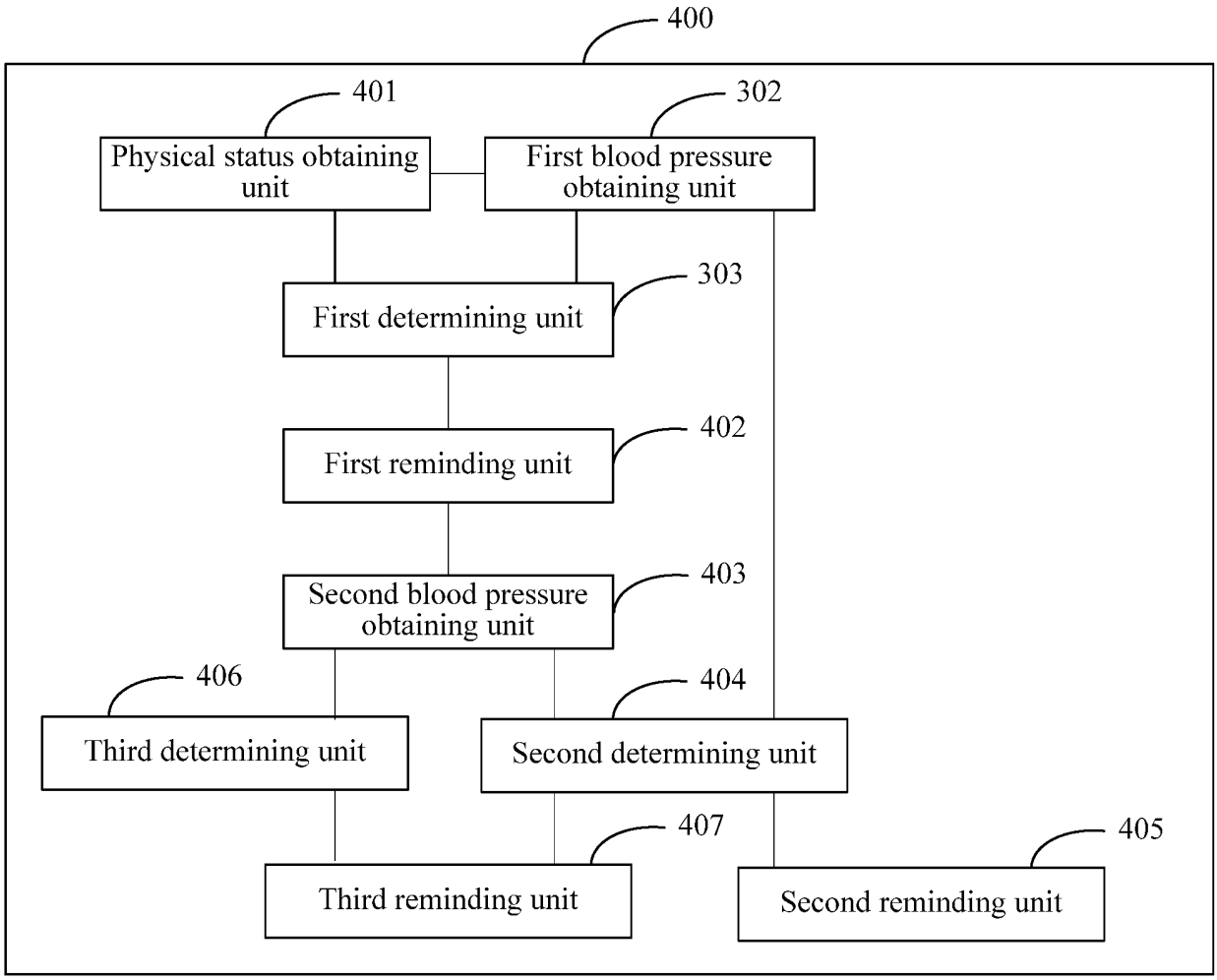
400
401
302
Physical status obtaining unit
First blood pressure obtaining unit
303
First determining unit
402
First reminding unit
403
Second blood pressure obtaining unit
406
404
Third determining unit
Second determining unit
407
405
Third reminding unit
Second reminding unit

FIG. 4

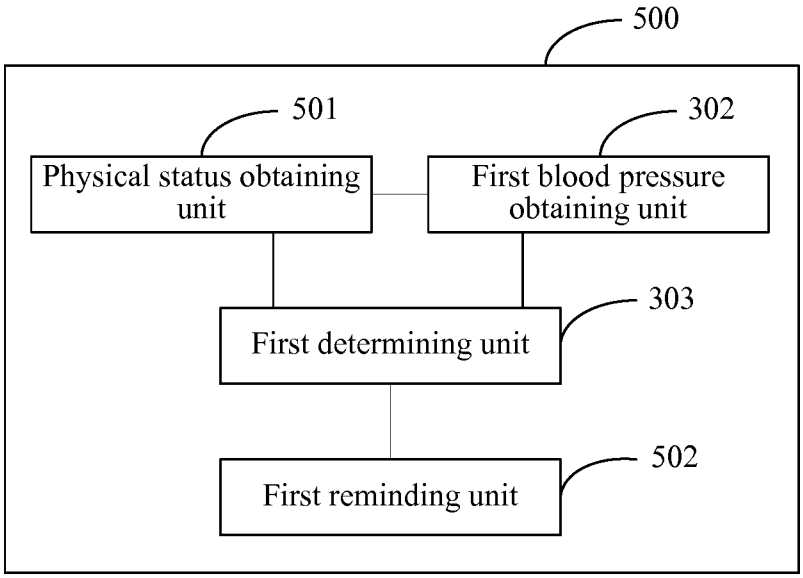
500
501
302
Physical status obtaining unit
First blood pressure obtaining unit
303
First determining unit
502
First reminding unit

FIG. 5

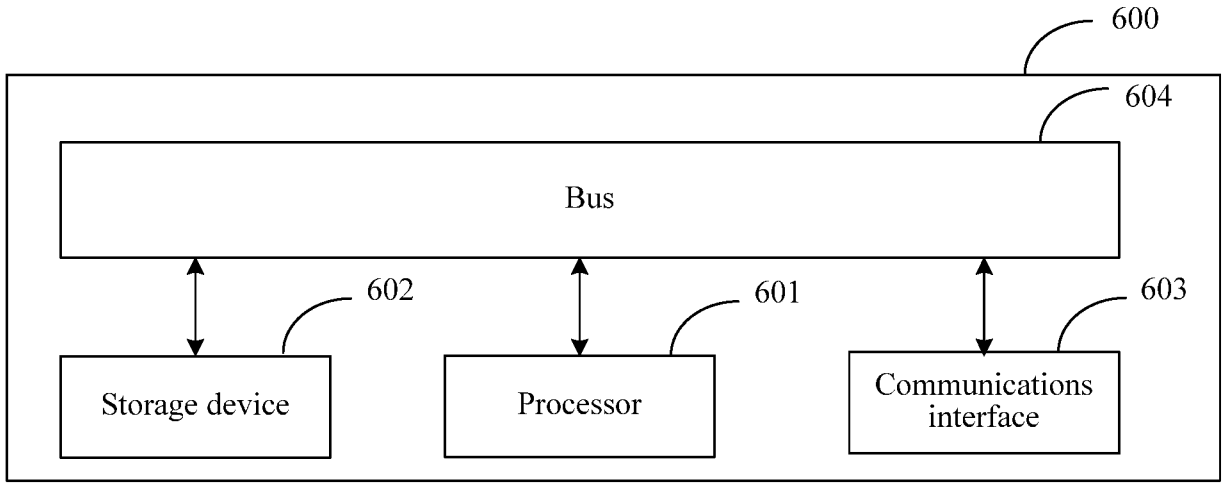
600
604
Bus
602
601
603
Storage device
Processor
Communications interface

FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 20120180029 A1 **[0005]**
- US 20060200011 A1 **[0006]**
- JP 2007325613 A **[0007]**

专利名称(译)	带血压监测的闹钟		
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摘要(译)

本发明实施例公开了一种用户提醒方法，装置和移动终端。用户提醒方法包括：当当前时间与预设提醒时间之间的时间差小于第一阈值时，终端设备获取用户的身体状态和用户的第一血压值;基于身体状态和第一血压值确定第一安全水平;以对应于第一安全等级的方式发送第一提醒信号。因此，避免了由于血压变化引起的用户的健康风险，降低了用户的血压负担，并且可以改善普通用户和早晨起床的高血压患者的安全性和舒适性。

Table 1

Physical status / Blood pressure level	First safety level	Awake state or rapid eye movement sleep period		Falling asleep period		Shallow sleep period		Deep sleep period	
		Systolic blood pressure	Diastolic blood pressure	Systolic blood pressure	Diastolic blood pressure	Systolic blood pressure	Systolic blood pressure	Systolic blood pressure	Diastolic blood pressure
Normal	0	<140	<90	<135	<85	<130	<80	<100	<70
Mild hypertension	1	≥140, <160	≥90, <100	≥135, <155	≥85, <95	≥130, <150	≥80, <90	≥120, <140	≥70, <80
Moderate hypertension	2	≥160, <180	≥100, <110	≥155, <175	≥95, <105	≥150, <170	≥90, <100	≥140, <160	≥80, <90
Severe hypertension	3	≥180	≥110	≥175	≥105	≥170	≥100	≥160	≥90