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(54) **Health monitoring system**

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Système de surveillance sanitaire

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WO-A-99/60926 **US-A- 5 720 771**

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DescriptionBACKGROUND OF THE INVENTION1. Field of the Invention

[0001] The present invention relates to a health monitoring system for remotely monitoring the condition of health of a person.

2. Description of the Related Background Art

[0002] A health monitoring system for remotely monitoring the condition of health of a person whose health is to be monitored has already been well-known, and is disclosed by, for example, Japanese Laid-open Patent Publication No. 302188/1998. In the conventional health monitoring system, the condition of health of a person whose health is to be monitored is judged at regular intervals, and the judgment result is transmitted to a control center. Further, urgent and abnormal states of the person whose condition has turned for the worse are detected, and an urgent information signal is transmitted to the control center when the person is in the urgent and abnormal states.

[0003] However, the conventional health monitoring system has a problem in that much time is required to correctly judge the condition of health of many people to be monitored.

[0004] From WO 99/60926 A a system and method for remotely monitoring asthma severity is known comprising a remote monitoring station which communicates with a central processing facility. Measurement data obtained by the remote monitoring station are transferred to the central processing facility which evaluates the transferred data in order to obtain a corresponding diagnosis. The features of the preamble of the independent claim 1 are known from said document WO 99/60926.

SUMMARY OF THE INVENTION

[0005] It is therefore an object of the present invention to provide a health monitoring system which is capable of correctly judging the condition of health of each person to be monitored even when many people to be monitored exist.

[0006] The health monitoring system according to the present invention which is for communication between at least one terminal device that is moved with a person to be monitored and a first center device comprises the features of claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS**[0007]**

Fig. 1 is a block diagram showing a structure of the health monitoring system according to the present

invention.

Fig. 2 is a block diagram showing a structure of a portable terminal device in the system of Fig. 1.

Fig. 3 shows the exterior of the portable terminal device in the system of Fig. 1.

Fig. 4 is a flowchart showing the operation of the system of Fig. 1.

Fig. 5 is a flowchart showing the operation of a health examination.

Fig. 6 shows an electrocardiogram waveform.

Fig. 7 shows an example in which data appear on a monitor.

Fig. 8 is a flowchart showing the operation of the system of Fig. 1.

Fig. 9 is a flowchart showing the operation of the system of Fig. 1.

Fig. 10 is a block diagram showing a structure of an on-vehicle terminal device.

Fig. 11 shows a main body, a camera and a sensor part of the terminal device in Fig. 10.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0008] An embodiment of the present invention will be hereinafter described in detail with reference to the attached drawings.

[0009] Fig. 1 shows a basic structure of the health monitoring system of the present invention. The health monitoring system includes portable terminal devices 1_1-1_n , a public telephone network 2, a first center device 3, and a second center device 4. The portable terminal devices 1_1-1_n are carried by people P_1-P_n to be monitored such as patients. The portable terminal devices 1_1-1_n are each provided with the function of a portable telephone, and are connectable to the public telephone network 2 through a relay device 5 for portable telephones. The relay device 5 is a device for establishing communication between the portable telephone and the public telephone network 2 by means of radio signals. Although a large number of relay devices including the relay device 5 are, in fact, stationed, only one relay device 5 is conveniently shown in Fig. 1. The first center device 3 and the second center device 4 are each connected to the public telephone network 2. The public telephone network 2 may be a digital network such as ISDN.

[0010] Since each of the portable terminal devices 1_1-1_n has the same structure, the structure of the portable terminal device 1_1 will be described hereinafter.

[0011] As shown in Fig. 2, the portable terminal device 1_1 includes a heart beat sensor 11, a camera 12, a GPS (Global Positioning Sensor) antenna 13, and a GPS receiver 14, in order to detect the condition of health of the person P_1 to be monitored. The heart beat sensor 11, which is provided as a biosensor, outputs a voltage signal that indicates a potential corresponding to a heart beat of the person P_1 . The heart beat sensor 11 is affixed to the body of the person P_1 . The camera 12, which is a so-

called digital camera, is disposed on the front of a case la of the portable terminal device 1₁, as shown in Fig. 3, in order to detect a facial expression of the person P₁. The camera 12 outputs image data which is indicative of the facial expression. The GPS antenna 13 and the GPS receiver 14 are disposed to detect an action of the person P₁. Positional data, which indicates a current position of the portable terminal device 1₁, i.e., a current position of the person P₁ to be monitored, is output from the GPS receiver 14.

[0012] A signal processing unit 17, which includes an amplifier 15 and a filter 16, is connected to the output of the heart beat sensor 11. The signal processing unit 17 amplifies a signal output from the heart beat sensor 10, thereafter extracts only a predetermined frequency component, and outputs the component as analog heart-beat data. A microcomputer 19 is connected to the output of the signal processing unit 17 through an A/D converter 18. The signal processing unit 17 is independent of the main body of the portable terminal device 1₁, and supplies a signal to the A/D converter 18 in the main body of the portable terminal device 1₁ by wire or wireless.

[0013] The respective outputs of the camera 12 and the GPS receiver 14 are connected to the microcomputer 19. A help switch 24 is further connected to the microcomputer 19. The help switch 24 is a switch operated by the person P₁ in an emergency.

[0014] A telephone portion 20 is further connected to the microcomputer 19. The telephone portion 20 serves as a portable telephone that has a data transmission-reception function. The telephone portion 20 has an input/output terminal connected to an antenna 23 for transmission and reception, a microphone 21 for inputting a voice to be transmitted and a speaker 22 for outputting a received voice.

[0015] The first center device 3 includes a computer, and is connected to the public telephone network 2 through a modem that is not shown. The first center device 3 further includes a memory 3a that stores diagnosis data (historical diagnosis information) about each person to be monitored as a database. Likewise, the second center device 4 includes a computer and a memory 4a, and is connected to the public telephone network 2 through a modem that is not shown. If the public telephone network 2 is a digital line, a terminal adaptor is used.

[0016] An operator of the first center device 3 is a nurse, for example, and an operator of the second center device 4 is a person more medically qualified than the operator of the first center device 3. The person is a doctor, for example.

[0017] Next, the operation of the health monitoring system constructed as above will be described.

[0018] As shown in Fig. 4, the first center device 3 sequentially accesses each of the portable terminal devices 1₁-1_n by means of a polling operation, and requests transmission of diagnostic data. When the portable terminal device 1₁ is requested to transmit the diagnostic data

(step S1), the microcomputer 19 of the terminal device 1₁ performs a health examination operation in response to the transmission request for the diagnostic data (step S2).

[0019] The microcomputer 19 of the portable terminal device 1₁ judges whether the peak value A, interval B, and acuminate angle C of the latest pulse have been detected from heart-beat data or not, as shown in Fig. 5, in the health examination operation (step S21). The heart-beat data is supplied from the signal processing unit 17 to the microcomputer 19 through the A/D converter 18, and is sequentially stored in a memory that is not shown. Since the stored heart-beat data shows an electrocardiogram waveform as shown in Fig. 6, a pulse peak value A, interval B, and acuminate angle C are detected as the present value in the microcomputer 19 whenever a new pulse is obtained in the electrocardiogram. In practice, the acuminate angle C is detected as a pulse width C. The detected peak value A, interval B, and pulse width C are stored in the memory, with the A, B, and C grouped together as a set, by at least predetermined times including the present time (for example, 60 times) that precede the present time.

[0020] When the latest pulse peak value A, interval B, and pulse width C are detected in step S21, the moving average values A₀, B₀, and C₀ of the respective peak value A, interval B, and pulse width C are calculated (steps S22-S24). The moving average value A₀ of the peak value A is an average value of the most recent peak values A of predetermined times stored in the memory. The same average calculation is applied to the interval B and pulse width C. When the moving average values A₀, B₀, and C₀ are calculated, thresholds $\alpha_1 A_0$, $\alpha_2 A_0$, $\beta_1 B_0$, $\beta_2 B_0$, $\gamma_1 C_0$, and $\gamma_2 C_0$ are calculated in accordance with the moving average values A₀, B₀, and C₀ (steps S25-S27). α_1 , α_2 , β_1 , β_2 , γ_1 , and γ_2 are coefficients which are previously set, where $\alpha_1 < \alpha_2$, $\beta_1 < \beta_2$, and $\gamma_1 < \gamma_2$.

[0021] It is judged whether the present peak value A is between the thresholds $\alpha_1 A_0$ and $\alpha_2 A_0$ or not (step S28). If $\alpha_1 A_0 \leq A \leq \alpha_2 A_0$, a flag FA is set to 0 (step S29), and if $A < \alpha_1 A_0$ or $A > \alpha_2 A_0$, the flag FA is set to 1 (step S30). It is judged whether the present interval B is between the thresholds $\beta_1 B_0$ and $\beta_2 B_0$ (step S31). If $\beta_1 B_0 \leq B \leq \beta_2 B_0$, a flag FB is set to 0 (step S32), and if $B < \beta_1 B_0$ or $B > \beta_2 B_0$, the flag FB is set to 1 (step S33). Further, it is judged whether the present pulse width C is between the thresholds $\gamma_1 C_0$ and $\gamma_2 C_0$ (step S34). If $\gamma_1 C_0 \leq C \leq \gamma_2 C_0$, a flag FC is set to 0 (step S35), and if $C < \gamma_1 C_0$ or $C > \gamma_2 C_0$, the flag FC is set to 1 (step S36).

[0022] When the flags FA to FC are obtained, the microcomputer 19 judges arrhythmia in accordance with the contents of the flags FA to FC (step S37). For example, if the flags FA to FC are all 1, pulsation is regarded as dangerous, if one or two of the flags FA to FC are 1, pulsation is regarded as needing caution, and if the flags FA to FC are all 0, pulsation is regarded as safe. The step S37 becomes a result of the health examination operation.

[0023] The microcomputer 19 in the portable terminal device 1₁ transmits diagnostic data, which is the result of the health examination operation, to the first center device 3 (step S3). The diagnostic data is transmitted together with electrocardiogram data which consists of the heart beat data.

[0024] When the first center device 3 receives the diagnostic data from the portable terminal device 1₁, the first center device 3 extracts diagnostic data corresponding to the person P₁ to be monitored from a diagnostic data group previously stored in the form of a database in the memory 3a, and, by collating the stored diagnostic data with the received diagnostic data, it is judged whether the received diagnostic data is abnormal or not (step S4). If abnormal, it is judged whether priority processing should be carried out in accordance with the level of abnormality, i.e., an urgent need (step S5). If the priority processing should be carried out, a data request is transmitted to the portable terminal device 1₁ (step S6).

[0025] The microcomputer 19 in the portable terminal device 1₁ responds to the data request and transmits detailed data that includes image data and positional data together with the latest electrocardiogram data to the first center device 3 (step S7). The image data indicates a facial expression of the person P₁ photographed by the camera 12, and the positional data indicates moving action of the person P₁ detected by the GPS antenna 13 and the GPS receiver 14.

[0026] When the detailed data are received, the first center device 3 displays them on the monitor 3b (step S8). Data about an electrocardiogram 61, image data 62, diagnostic data 63, etc., concerning the person P₁ are displayed on the monitor 3b as shown in Fig. 7. The operator diagnoses the condition of the person P₁ based on the displayed data. The first center device 3 accepts a result of the diagnosis given by the operator (step S9), and judges whether the result of the diagnosis is doubtful or not (step S10). If not doubtful, the portable terminal device 1₁ is informed that the result has no doubt (step S11). The transmission of no doubt in step S11 includes a message to confirm whether there is a problem in fixing the sensor or a message to recommend a rest.

[0027] The first center device 3 received the detailed data from the portable terminal device 1₁ only when an abnormal condition is detected by self-diagnosis in the portable terminal device 1₁. Therefore, unnecessary data is not transmitted and received, and time required to scan the portable terminal devices 1₁-1_n by the polling operation can be shortened. Further, the detailed data are checked by the operator, such as a nurse, by the use of the past diagnostic data when an abnormal condition is detected by self-diagnosis in the portable terminal device 1₁. Thus, proper diagnosis can be carried out.

[0028] On the other hand, if the judgment result in step S10 is doubtful, the detailed data are transmitted to the second center device 4 for further diagnosis (step S12).

[0029] When the detailed data are received, the second center device 4 displays them on the monitor 4b (step

S13). The operator of the second center device 4 is an expert who is more medically qualified than the operator of the first center device 3. The operator of the second center device 4 diagnoses the condition of the person P₁ accordance with the data about the person P₁ displayed on the monitor 4b as shown in Fig. 7, and the second center device 4 accepts a result of the diagnosis (step S14). An instruction concerning the result of the diagnosis are transmitted from the second center device 4 to the first center device 3 (step S15), and then are further supplied to the portable terminal device 1₁ (step S16).

[0030] When the operator of the first center device 3 cannot give a proper diagnosis result to the person P₁ as mentioned above, the instruction by the proper diagnosis of the more qualified operator of the second center device 4 can be given to the person P₁.

[0031] The instruction is supplied in the form of audio data or character data. In the case of audio data, a voice is output from the speaker 22 of the portable terminal device 1₁, and, in the case of character data, characters are displayed on a display 25.

[0032] Further, the following operations can be carried out between the portable terminal devices 1₁-1_n and the first center device 3.

[0033] When the person P₁ to be monitored feels bodily unwell and turns on a help switch 24 of the portable terminal device 1₁, the microcomputer 19 in the portable terminal device 1₁ confirms the operation of the help switch 19 as shown in Fig. 8 (step S41), and an emergency call is sent to the first center device 3 (step S42). When the emergency call is received, the first center device 3 instructs the operator to perform an urgent response (step S43). Thereafter, an urgent processing operation is carried out in accordance with manipulation of the operator (step S44). In the urgent processing, the first center device 3 has electrocardiogram data, image data, and positional data transmitted from the portable terminal device 1₁ of the person P₁, and the data are transmitted to the second center device 4. As a result, an appropriate instruction is transmitted from the operator of the second center device 4 to the person P₁ through the first center device 3.

[0034] When the person P₁ calls the first center device 3 by operating a button of the portable terminal device 1₁ in order to check his/her health, the microcomputer 19 in the portable terminal device 1₁ confirms that it is a call to the first center device 3 (step S51), as shown in Fig. 9, and makes a request call to the first center device 3 (step S52). When the request call is received, the first center device 3 instructs the operator to perform a service response (step S53). Thereafter, a service processing operation is carried out in accordance with manipulation of the operator (step S54). In the service processing, the first center device 3 is instructed to transmit electrocardiogram data, image data, and positional data to the portable terminal device 1₁ of the person P₁. The operator of the first center device 3 determines whether the person P₁ is in poor condition in accordance with the electrocar-

diagram data, image data, and positional data, or not and a result of the determination is sent back to the person P₁ through, for example, e-mail.

[0035] The above-mentioned embodiment has described the example in which the operator such as a nurse diagnoses the person P₁ while checking the data (electrocardiogram) and the detailed data (facial expression) through the first center device 2. Instead, it is possible to automatically compare data received at the current time at the first center device 2 with data stored over a long period (i.e., data corresponding to a clinical record) and judge the condition of the person P₁ with reference to a result of the comparison.

[0036] In addition, the above-mentioned embodiment has described the example in which a position of the person P₁ to be monitored is determined by the GPS antenna 13 and GPS receiver 14. Instead, it is possible to properly determine a position of the person P₁ by comparing the receiving levels of transmitted radio waves at a plurality of receiving stations.

[0037] In addition, the above-mentioned embodiment has described the example in which the health examination operation in step S2 is executed when polling is carried out. The health examination operation in step S2 may be always executed so that data during a certain period and judgment results are stored, and, when polling is carried out, the data during the certain period or data which has not been transmitted may be transmitted on the basis of the judgment results during the certain period.

[0038] The GPS data (positional information) obtained from the GPS receiver 14 can be transmitted not as data concerning a point but as data concerning a locus (movement line) that has been continuously recorded. Therefore, it is possible to judge abnormal condition when the locus meanders or overlaps.

[0039] Although the person P₁ to be monitored is a pedestrian in the above embodiment, he/she may be a vehicle driver. If so, a terminal device of the person P₁ is mounted on the vehicle and is constructed as shown in Fig. 10. That is, the on-vehicle terminal device includes a heart beat sensor 31, a perspiration sensor 32, a camera 33, a GPS antenna 34, a GPS receiver 35, and a movement sensor 36 in order to detect the condition of health of the person P₁. The heart beat sensor 31, the perspiration sensor 32, and the movement sensor 36 are connected to a microcomputer 43 through signal processing units 37-39, each of which includes an amplifier and a filter, and A/D converters 40-42. The camera 33 and the GPS receiver 35 are connected directly to the microcomputer 43.

[0040] As in the case of the heart beat sensor 11, the heart beat sensor 31 outputs a voltage signal that indicates a potential corresponding to heart beat of the person P₁. A detecting portion of the heart beat sensor 31 has a metallic sheet electrode 52 affixed to a grip portion of a steering wheel 51 as shown in Fig. 11, and heart-beat data is detected by allowing the palms of the person

P₁ to be monitored to contact with the grip portion. The perspiration sensor 32 generates a voltage signal according to perspiration of the person P₁ by the use of the electrode 52. The camera 33 is placed on the upper portion of an interior windshield in order to detect a facial expression of the person P₁. The GPS antenna 34 is mounted on the outer face of the vehicle body. The movement sensor 36 serves to detect speed and acceleration of the vehicle.

[0041] As in the case of the portable terminal device 1₁, a help switch 44, a telephone portion 45, and a display 46 are further connected to the microcomputer 43. The help switch 44 is disposed at the steering wheel 51. A microphone 47, a speaker 48, and an antenna 49 are connected to the telephone portion 45.

[0042] The signal processing units 37-39, the A/D converters 40-42, the microcomputer 43, and the telephone portion 45 are formed in a main body 54.

[0043] Since the operation of the on-vehicle terminal device constructed as above is the same as that of the above-mentioned portable terminal device 1₁, a repetitive description thereof is omitted.

[0044] In the embodiment of the on-vehicle terminal device, measurement data can be invalidated on the basis of acceleration detected by the movement sensor 36 when the acceleration exceeds a predetermined value. Accordingly, it is possible to remove an inaccurate measurement value resulting from worsening of a measurable environment caused by, for example, vehicle vibrations.

[0045] Further, in order to prevent difficulty when driving, a guidance function by a voice synthesizer may be provided so as to aid the person P₁ (driver) in a measurement operation or to give instructions, such as advice based on a diagnostic result.

[0046] The heart beat sensors 11, 31 may be formed as an earring type to detect a potential according to the pulse of the person P₁ from the ear in the above-mentioned embodiment.

Alternatively, they may be formed as a finger type to detect the potential from the finger.

[0047] In the above embodiment, arrhythmia is detected by obtaining electrocardiogram data of the person P₁ to be monitored. Instead, the blood pressure of the person P₁ may be detected to judge high blood pressure or low blood pressure and transmit the judgment data to the first center device. Alternatively, the body temperature of the person P₁ may be detected to judge a high body temperature or low body temperature and transmit the judgment data to the first center device.

[0048] As described above, according to the health monitoring system of the present invention, the health of a person to be monitored can be correctly judged even when a large number of people to be monitored exist.

Claims

1. A health monitoring system for communication be-

- tween at least one terminal device (1_1-1_n) that is moved with a person whose health is monitored and a first center device (3), wherein said terminal device includes: sensing means (11, 12, 14, 17) for detecting health parameters of the person, and diagnosis means (19) for diagnosing the condition of health of the person in accordance with a result of the detection of said sensing means, wherein said first center device (3) includes storage means (3a) for storing historical diagnosis information concerning the person, **characterized in that** said terminal device (1_1-1_n) further includes means (19, 20) for transmitting a result of the diagnosis of said diagnosis means to said first center device (3); and **in that** said first center device (3) further includes judgment means (3) for receiving the result of the diagnosis of said diagnosis means and for judging whether detailed data concerning the condition of health of the person is required in accordance with the received result of the diagnosis and the historical diagnosis information, and instruction means (3) for issuing a request command of the detailed data to said terminal device when said judgment means judges that detailed data is required.
2. The health monitoring system of Claim 1, wherein said terminal device (1_1-1_n) can transmit the result of the detection of said sensing means (11, 12, 14, 17) as the detailed data to said first center device (3) in accordance with the request command.
 3. The health monitoring system of Claim 1, further comprising a second center (4) device which is independent of said first center device (3), wherein said first center device (3) includes means for transmitting the result of the diagnosis of said diagnosis means (19) and the detailed data received from said terminal device (1_1-1_n), to said second center device (4) in accordance with an input operation, and said second center device (4) can receive the result of the diagnosis of said diagnosis means (19) and the detailed data supplied from said first center device (3) and can issue an instruction in accordance with the received result of the diagnosis and the detailed data.
 4. The health monitoring system of Claim 3, wherein said first center device (3) can transmit an instruction to said terminal device (1_1-1_n) in accordance with an input operation.
 5. The health monitoring system of Claim 1, wherein when a plurality of terminal devices (1_1-1_n) by each of which the detailed data is required exist, said judgment means (3) can judge a terminal device (1_1-1_n) having a highest priority of the plurality of terminal devices (1_1-1_n) in accordance with the result of the diagnosis and the historical diagnosis information, and said instruction means (3) issues the request command to the terminal device (1_1-1_n) having the higher priority.
 6. The health monitoring system of Claim 1, wherein said sensing means (11, 12, 14, 17) can detect biological information and action pattern information as the health parameters.
 7. The health monitoring system of Claim 1, wherein said sensing means (11, 12, 14, 17) has a heart beat sensor (11) for outputting a voltage signal which can indicate a potential corresponding to a heart beat of the person, a signal processing unit (17) for outputting electrocardiogram data based on the voltage signal, a camera (12) for outputting image data which is indicative of the facial expression of the person, and a GPS receiver (14) for outputting positional data which can indicate a current position of the person, and said detailed data includes the latest electrocardiogram data, the image data and the positional data.
 8. The health monitoring system of Claim 1, wherein said judgment means (3) can judge whether the received result of the diagnosis is abnormal by collating the historical diagnosis information with the received result of the diagnosis, and can judge whether priority processing should be carried out in accordance with the level of abnormality of the received result of the diagnosis if the received result of the diagnosis is abnormal, and said instruction means (3) can issue the request command if the priority processing should be carried out.

Patentansprüche

1. Gesundheitsüberwachungssystem zur Kommunikation zwischen zumindest einer Terminalvorrichtung (1_1-1_n), die mit einer Person, deren Gesundheit überwacht wird, bewegt wird, und einer ersten Centervorrichtung (3), wobei die Terminalvorrichtung umfasst:

ein Erfassungsmittel (11, 12, 14, 17) zur Detektion von Gesundheitsparametern der Person, und

ein Diagnosemittel (19) zur Diagnose des Gesundheitszustands der Person gemäß einem Ergebnis der Detektion des Erfassungsmittels, wobei die erste Centervorrichtung (3) ein Speichermittel (3a) zum Speichern historischer Diagnoseinformation, die die Person betrifft, aufweist, **dadurch gekennzeichnet, dass** die Terminalvorrichtung (1_1-1_n) ferner ein Mittel (19, 20) zum Übertragen eines Ergebnisses der Diagno-

- se des Diagnosemittels an die erste Centervorrichtung (3) aufweist;
und dass die erste Centervorrichtung (3) ferner ein Beurteilungsmittel (3) zum Empfang des Ergebnisses der Diagnose des Diagnosemittels und zur Beurteilung, ob detaillierte Daten, die den Gesundheitszustand der Person betreffen, erforderlich sind, gemäß dem empfangenen Ergebnis der Diagnose und der historischen Diagnoseinformation aufweist, und ein Anweisungsmittel (3) zur Ausgabe eines Anforderungsbefehls der detaillierten Daten an die Terminalvorrichtung, wenn das Beurteilungsmittel beurteilt, dass die detaillierten Daten erforderlich sind.
2. Gesundheitsüberwachungssystem nach Anspruch 1, wobei die Terminalvorrichtung (1₁-1_n) das Ergebnis der Detektion des Erfassungsmittels (11, 12, 14, 17) als die detaillierten Daten an die erste Centervorrichtung (3) gemäß dem Anforderungsbefehl übertragen kann.
3. Gesundheitsüberwachungssystem nach Anspruch 1, ferner mit:
- einer zweiten Centervorrichtung (4), die von der ersten Centervorrichtung (3) unabhängig ist, wobei die erste Centervorrichtung (3) ein Mittel zum Übertragen des Ergebnisses der Diagnose des Diagnosemittels (19) und der detaillierten Daten, die von der Terminalvorrichtung (1₁-1_n) empfangen werden, an die zweite Centervorrichtung (4) gemäß einem Eingabevorgang umfasst, und die zweite Centervorrichtung (4) das Ergebnis der Diagnose des Diagnosemittels (19) und die detaillierten Daten, die von der ersten Centervorrichtung (3) geliefert werden, empfangen kann und eine Anweisung gemäß dem empfangenen Ergebnis der Diagnose und der detaillierten Daten ausgeben kann.
4. Gesundheitsüberwachungssystem nach Anspruch 3, wobei die erste Centervorrichtung (3) eine Anweisung an die Terminalvorrichtung (1₁-1_n) gemäß einem Eingabevorgang übertragen kann.
5. Gesundheitsüberwachungssystem nach Anspruch 1, wobei, wenn eine Vielzahl von Terminalvorrichtungen (1₁-1_n), wobei von jeder derselben die detaillierten Daten erforderlich sind, existiert, das Beurteilungsmittel (3) eine Terminalvorrichtung (1₁-1_n) mit einer höchsten Priorität aus der Vielzahl von Terminalvorrichtungen (1₁-1_n) gemäß dem Ergebnis der Diagnose und der historischen Diagnoseinformation beurteilen kann, und
- das Anweisungsmittel (3) den Anforderungsbefehl an die Terminalvorrichtung (1₁-1_n), die die höhere Priorität aufweist, ausgibt.
6. Gesundheitsüberwachungssystem nach Anspruch 1, wobei das Erfassungsmittel (11, 12, 14, 17) biologische Information und Wirkungsmusterinformation als die Gesundheitsparameter detektieren kann.
7. Gesundheitsüberwachungssystem nach Anspruch 1, wobei das Erfassungsmittel (11, 12, 14, 17) einen Herzschlagsensor (11) zur Ausgabe eines Spannungssignals, das ein Potential angeben kann, das einem Herzschlag der Person entspricht, eine Signalverarbeitungseinheit (17) zur Ausgabe von Elektrokardiogrammdaten auf Grundlage des Spannungssignals, eine Kamera (12) zur Ausgabe von Bilddaten, die den Gesichtsausdruck der Person angeben, und einen GPS-Empfänger (14) zur Ausgabe von Positionsdaten aufweist, die eine gegenwärtige Position der Person angeben können, und die detaillierten Daten die neuesten Elektrokardiogrammdaten, die Bilddaten und die Positionsdaten umfassen.
8. Gesundheitsüberwachungssystem nach Anspruch 1, wobei das Beurteilungsmittel (3) beurteilen kann, ob das empfangene Ergebnis der Diagnose unnormal ist, indem die historische Diagnoseinformation mit dem empfangenen Ergebnis der Diagnose verglichen wird, und beurteilen kann, ob eine Prioritätsbearbeitung gemäß dem Niveau an Unnormalität des empfangenen Ergebnisses der Diagnose ausgeführt werden soll, wenn das empfangene Ergebnis der Diagnose unnormal ist, und das Anweisungsmittel (3) den Anforderungsbefehl ausgeben kann, wenn die Prioritätsbearbeitung ausgeführt werden soll.

Revendications

1. Système de surveillance de santé destiné à la communication entre au moins un appareil terminal (1₁-1_n) qui est déplacé avec une personne dont la santé est surveillée et un premier appareil central (3), dans lequel ledit appareil terminal inclut :

des moyens de détection (11, 12, 14, 17) pour détecter des paramètres de santé de la personne, et

des moyens de diagnostic (19) pour diagnostiquer la condition de santé de la personne en accord avec un résultat de la détection desdits moyens de détection,

dans lequel ledit premier appareil central (3) inclut des moyens de stockage (3a) pour stocker des informations de diagnostic historiques con-

- cernant la personne,
caractérisé en ce que ledit appareil terminal (1₁-1_n) inclut encore des moyens (19, 20) pour transmettre un résultat du diagnostic desdits moyens de diagnostic audit premier appareil central (3) ;
 et **en ce que** ledit premier appareil central (3) inclut en outre :
- des moyens de jugement (3) pour recevoir le résultat du diagnostic desdits moyens de diagnostic et pour juger si des données détaillées concernant la condition de santé de la personne sont requises selon le résultat reçu du diagnostic et selon les informations de diagnostic historiques, et des moyens d'instruction (3) pour délivrer un ordre de requête des données détaillées audit appareil terminal quand lesdits moyens de jugement jugent que des données détaillées sont requises.
2. Système de surveillance de santé selon la revendication 1, dans lequel ledit appareil terminal (1₁-1_n) est capable de transmettre le résultat de la détection desdits moyens de détection (11, 12, 14, 17) à titre de données détaillées vers ledit premier appareil central (3) en accord avec l'ordre de requête.
 3. Système de surveillance de santé selon la revendication 1, comprenant en outre :

un second appareil central (4) qui est indépendant dudit premier appareil central (3), dans lequel ledit premier appareil central (3) inclut des moyens pour transmettre le résultat du diagnostic desdits moyens de diagnostic (19) et les données détaillées reçues depuis ledit appareil terminal (1₁-1_n) audit second appareil central (4) en accord avec une opération d'entrée, et ledit second appareil central (4) est capable de recevoir le résultat du diagnostic desdits moyens de diagnostic (19) et les données détaillées fournies depuis ledit premier appareil central (3), et de délivrer une instruction en accord avec le résultat reçu du diagnostic et avec les données détaillées.
 4. Système de surveillance de santé selon la revendication 3, dans lequel ledit premier appareil central (3) est capable de transmettre une instruction audit appareil terminal (1₁-1_n) en accord avec une opération d'entrée.
 5. Système de surveillance de santé selon la revendication 1, dans lequel, lorsqu'il existe une pluralité d'appareils terminaux (1₁-1_n) qui requièrent chacun les données détaillées, lesdits moyens de jugement (3) sont capables de juger qu'un appareil terminal (1₁ - 1_n) dispose de la priorité la plus élevée parmi la pluralité de dispositifs terminaux (1₁- 1_n) en accord avec le résultat du diagnostic et les informations de diagnostic historiques, et lesdits moyens d'instruction (3) délivrent l'ordre de requête à l'appareil terminal (1₁ - 1_n) ayant la priorité la plus élevée.
 6. Système de surveillance de santé selon la revendication 1, dans lequel lesdits moyens de détection (11, 12, 14, 17) sont capables de détecter des informations biologiques et des informations concernant des modèles d'action à titre de paramètres de santé.
 7. Système de surveillance de santé selon la revendication 1, dans lequel lesdits moyens de détection (11, 12, 14, 17) comprennent un détecteur de battements cardiaques (11) pour délivrer un signal de tension qui peut indiquer un potentiel correspondant à un battement cardiaque de la personne, une unité de traitement de signaux (17) pour délivrer des données électrocardiographiques en se basant sur le signal de tension, un appareil de prise de vue (12) pour délivrer des données image qui indiquent l'expression faciale de la personne, et un récepteur GPS (14) pour délivrer des données de position qui peuvent indiquer une position actuelle de la personne, et lesdites données détaillées incluent les données concernant l'électrocardiogramme le plus récent, les données image et les données de position les plus récentes.
 8. Système de surveillance de santé selon la revendication 1, dans lequel lesdits moyens de jugement (3) sont capables de juger si le résultat reçu du diagnostic est anormal par compilation des informations de diagnostic historiques avec le résultat reçu du diagnostic, et sont capables de juger s'il s'agit d'effectuer un traitement prioritaire en accord avec le niveau d'anomalie des résultats reçus du diagnostic si les résultats reçus du diagnostic sont anormaux, et lesdits moyens d'instruction (3) sont capables de délivrer l'ordre de requête si le traitement prioritaire doit être effectué.

FIG. 1

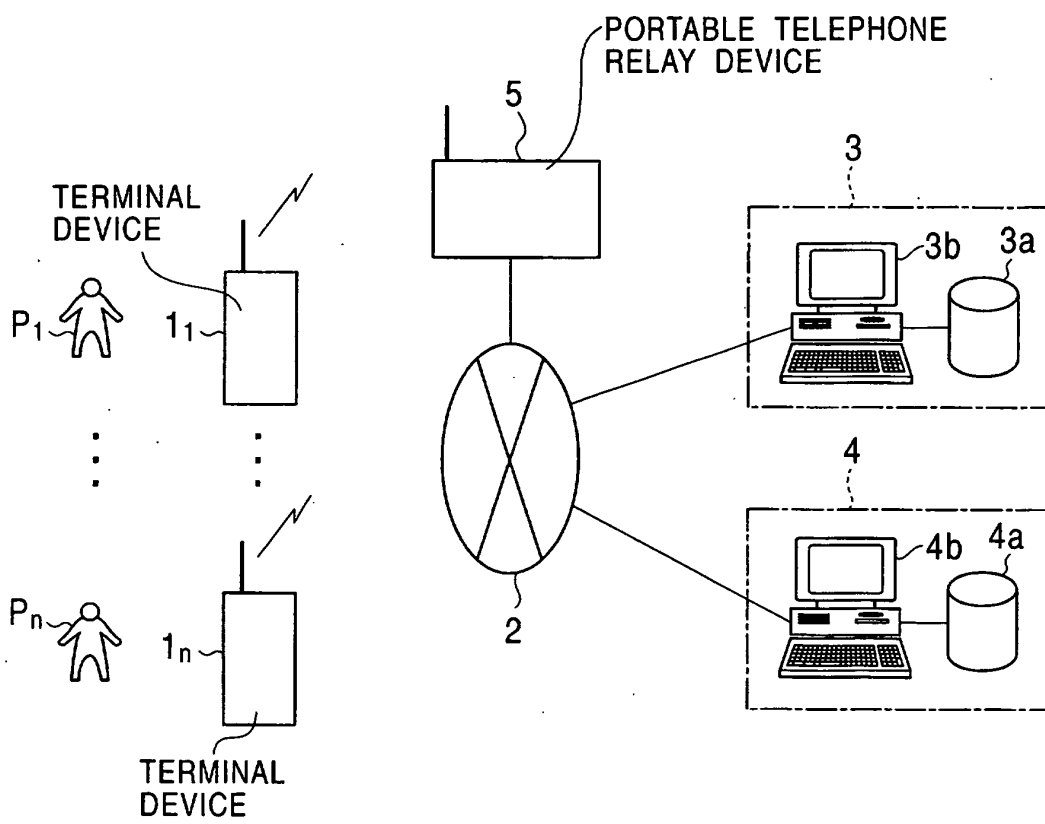


FIG. 2

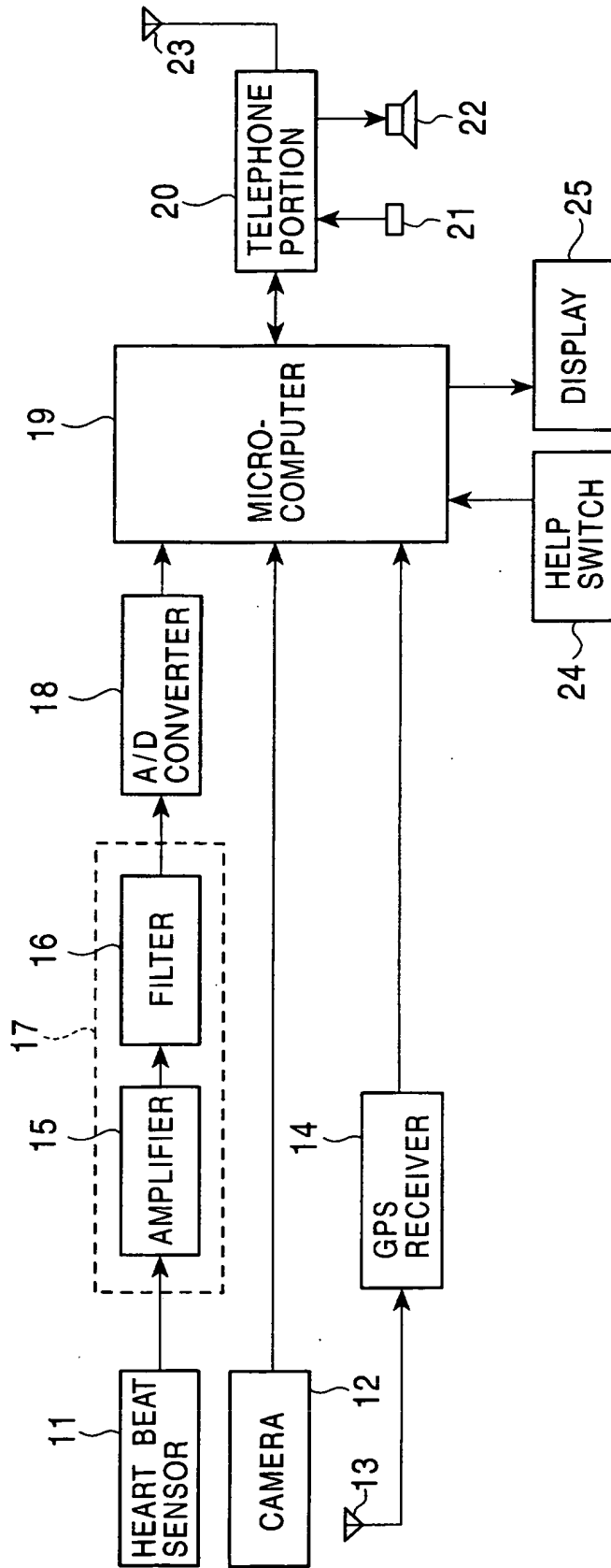


FIG. 3

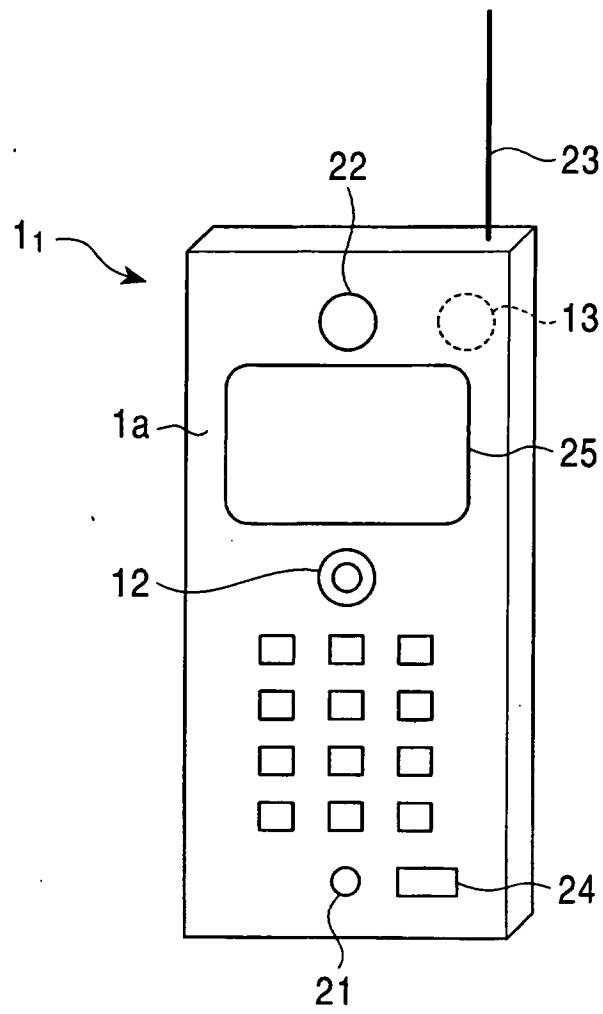


FIG. 4

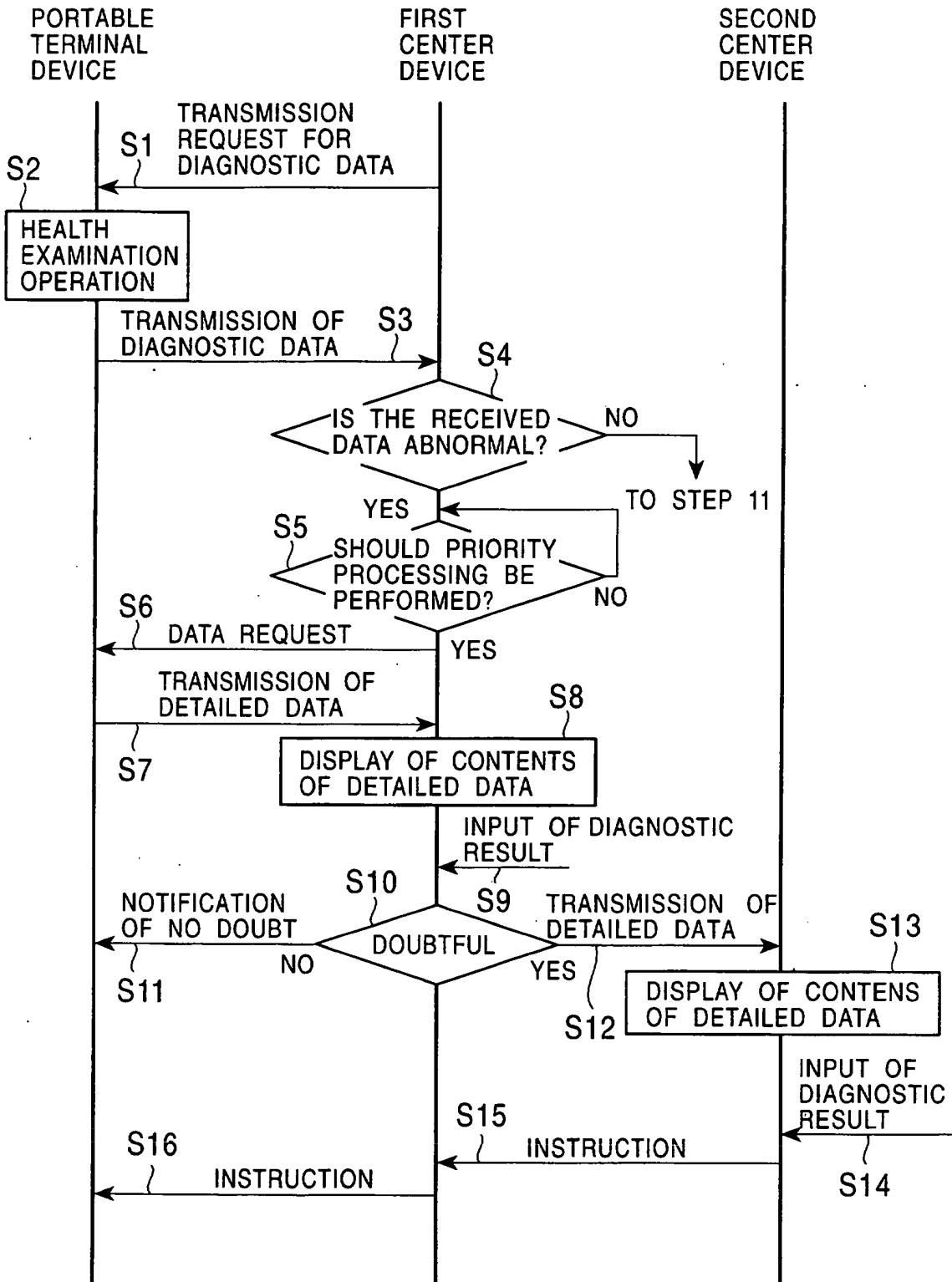


FIG. 5

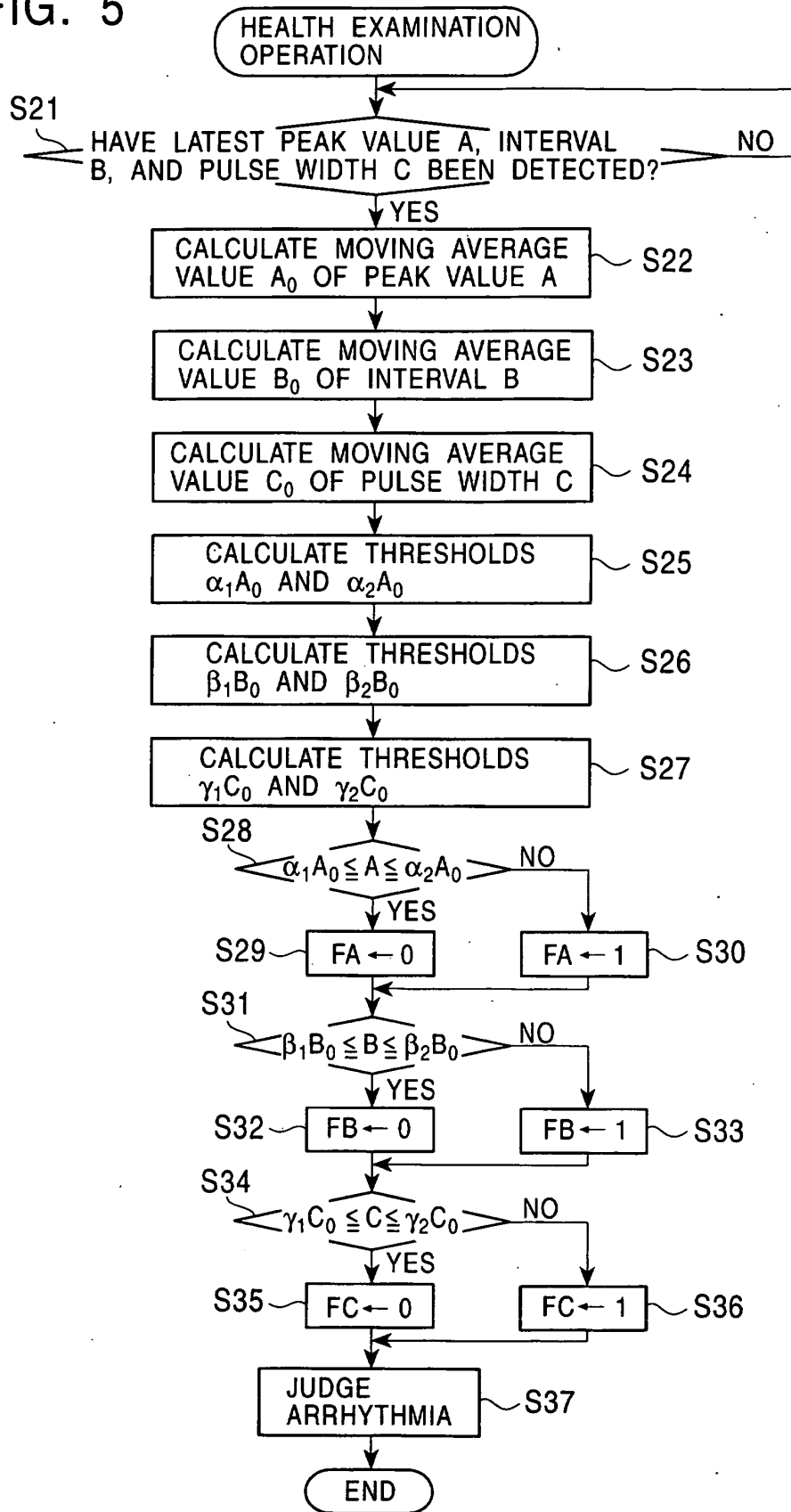


FIG. 6

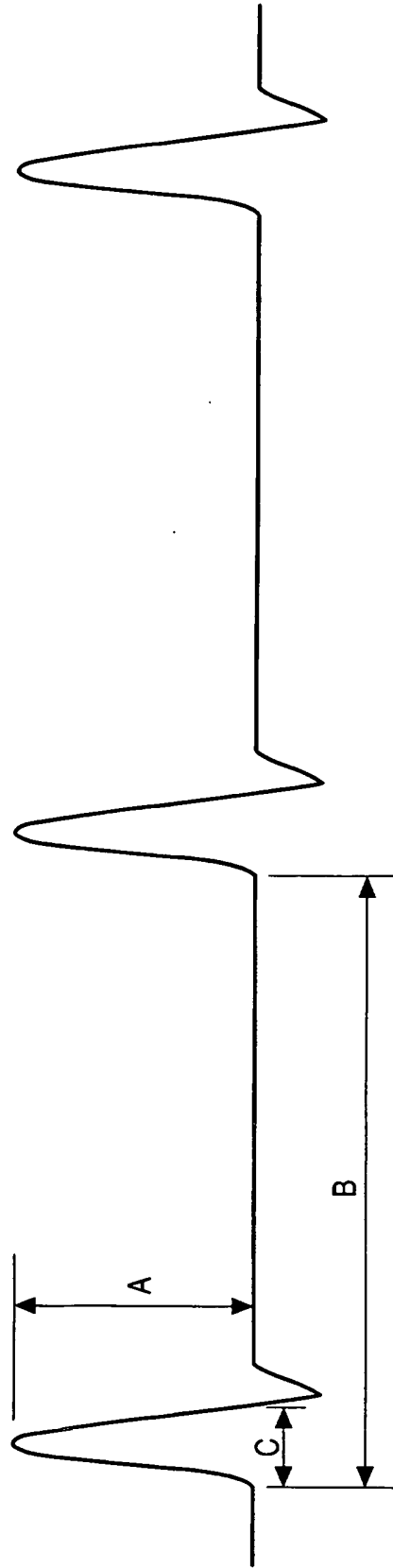


FIG. 7

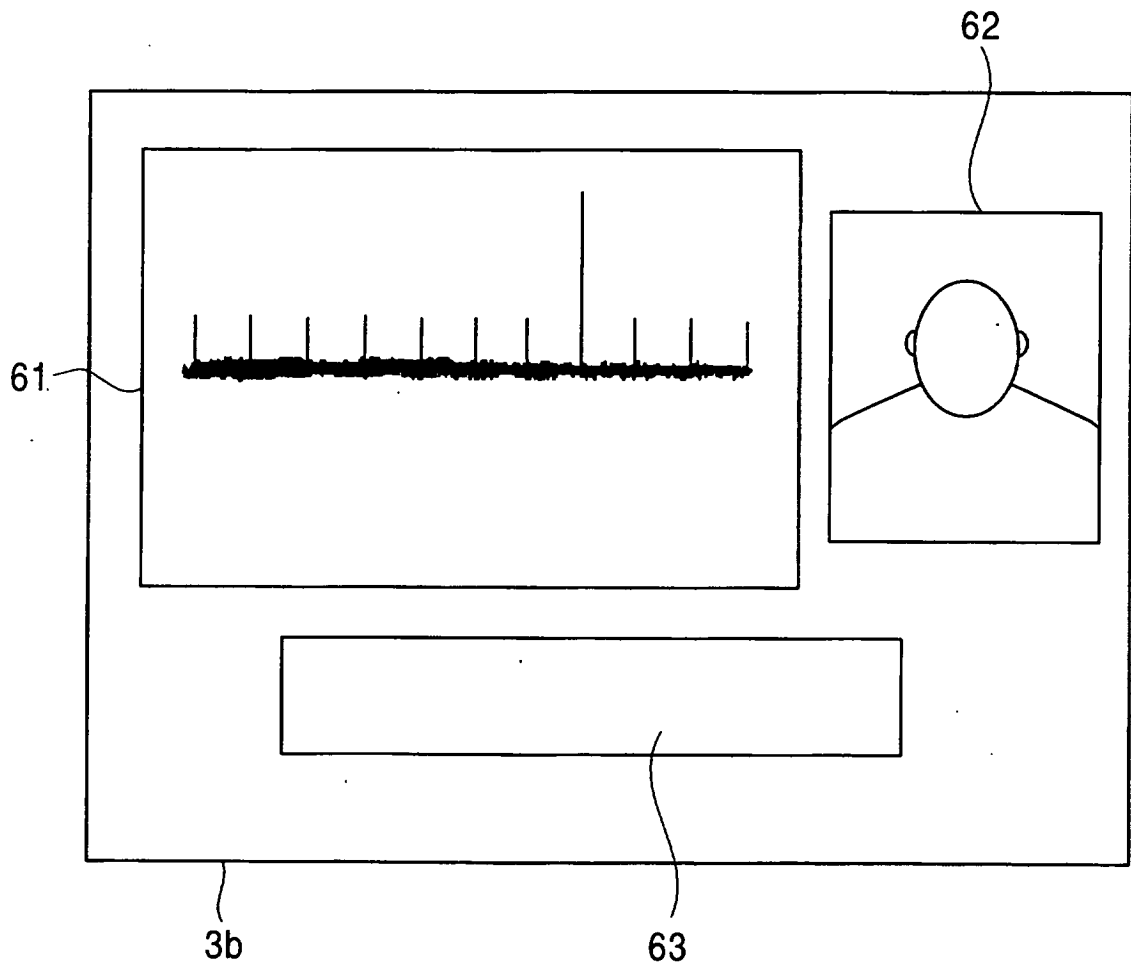


FIG. 8

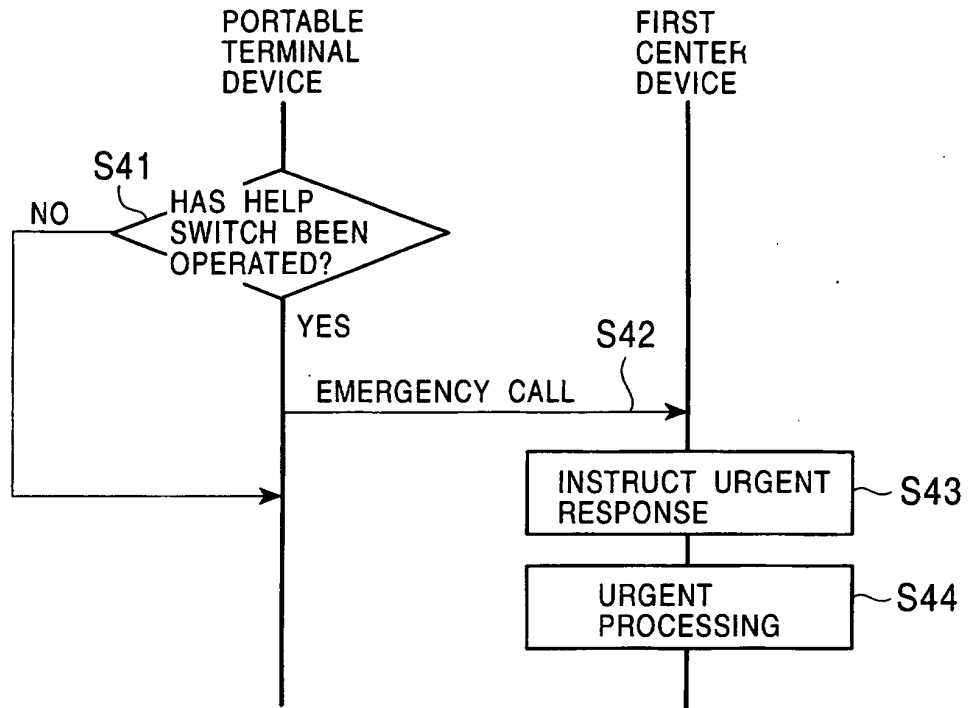


FIG. 9

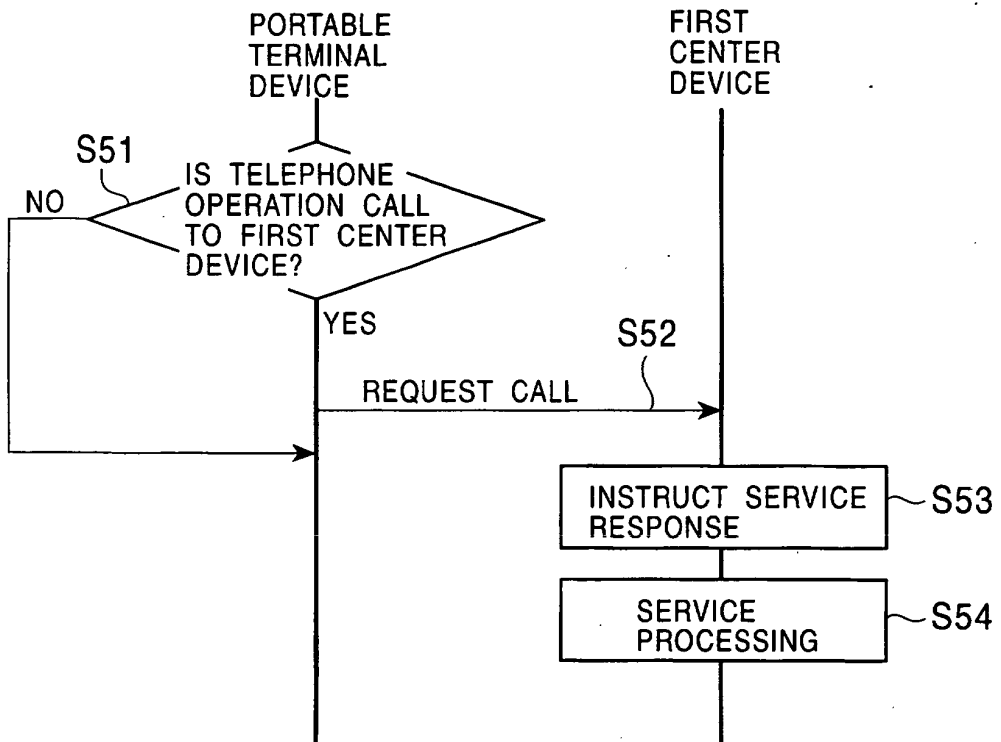


FIG. 10

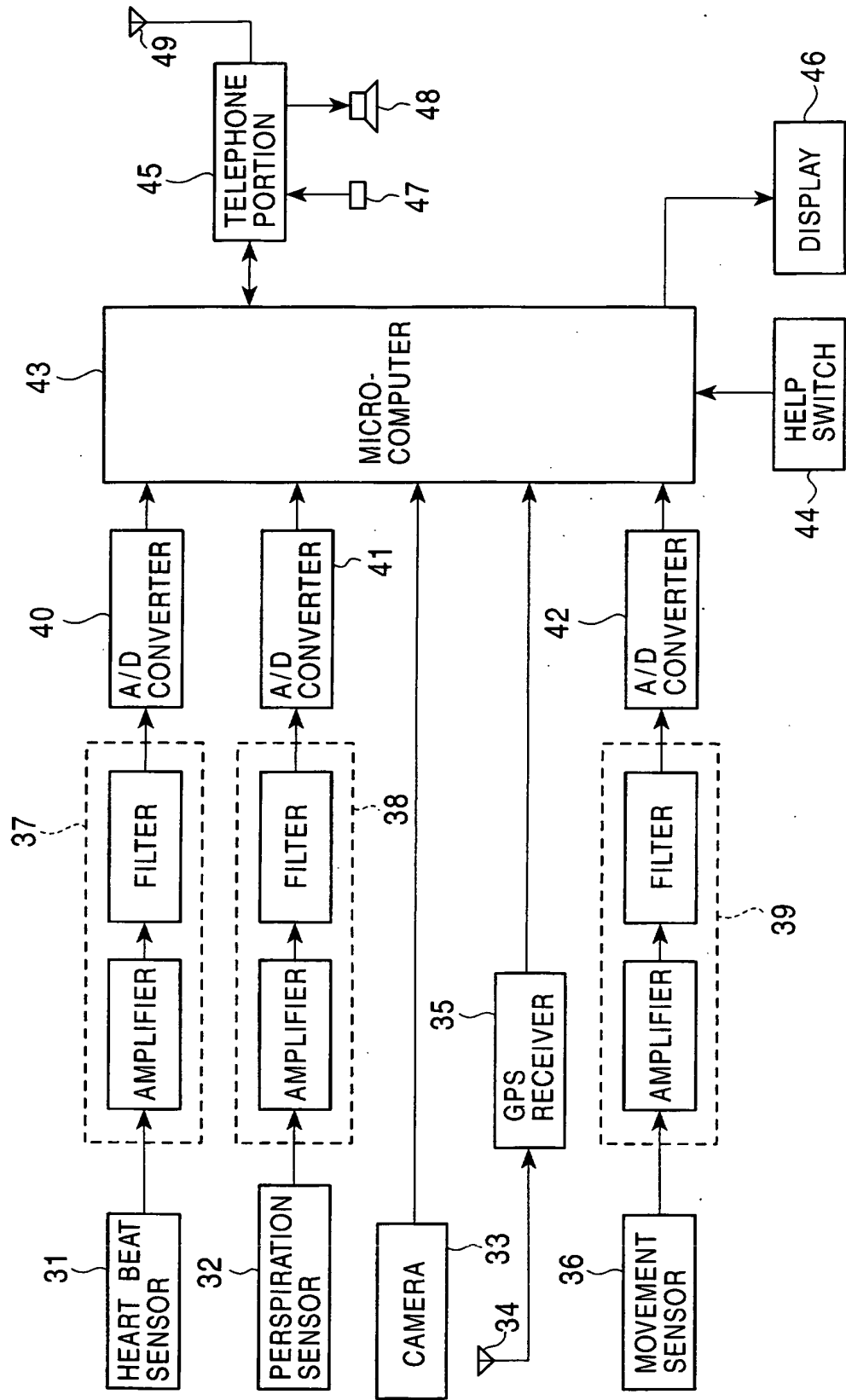
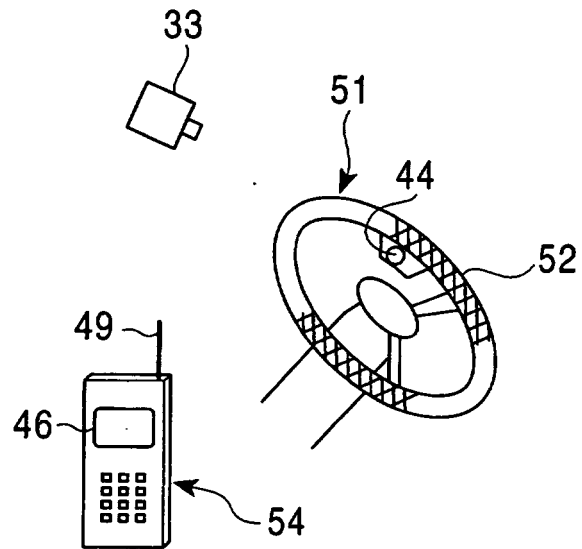


FIG. 11



专利名称(译)	健康监测系统		
公开(公告)号	EP1133949B1	公开(公告)日	2006-12-06
申请号	EP2001106269	申请日	2001-03-14
[标]申请(专利权)人(译)	日本先锋公司		
申请(专利权)人(译)	先锋公司		
当前申请(专利权)人(译)	先锋公司		
[标]发明人	YASUSHI MITSUO C O PIONEER OHMORI PLANT YANAGIDAIRA MASATOSHI C O PIONEER OHMORI PLANT		
发明人	YASUSHI, MITSUO, C/O PIONEER OHMORI PLANT YANAGIDAIRA, MASATOSHI. C/O PIONEER OHMORI PLANT		
IPC分类号	A61B5/00 G06F19/00 A61B5/04		
CPC分类号	A61B5/0006 A61B5/1112 A61B5/6816 A61B5/6817 A61B5/6887 A61B5/743 A61B2503/22 G06F19/00 G06F19/3418 G16H10/60 G16H40/63 G16H40/67 Y10S128/903 Y10S128/92		
代理机构(译)	MANITZ , FINSTERWALD & PARTNER GBR		
优先权	2000075436 2000-03-17 JP		
其他公开文献	EP1133949A1		
外部链接	Espacenet		

摘要(译)

一种健康监测系统，用于在与监测健康的人一起移动的至少一个终端设备与第一中心设备之间进行通信。终端设备检测人的健康参数，并根据检测结果诊断人的健康状况，并将诊断结果发送给第一中心设备。第一中心设备存储关于人的历史诊断信息，从终端设备接收诊断结果，根据诊断结果和历史诊断判断是否需要关于人的健康状况的详细数据当判断需要详细数据时，向终端设备发出详细数据的请求命令。

