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(54) **PATIENT HEALTHCARE MONITORING/MAINTENANCE SYSTEM**

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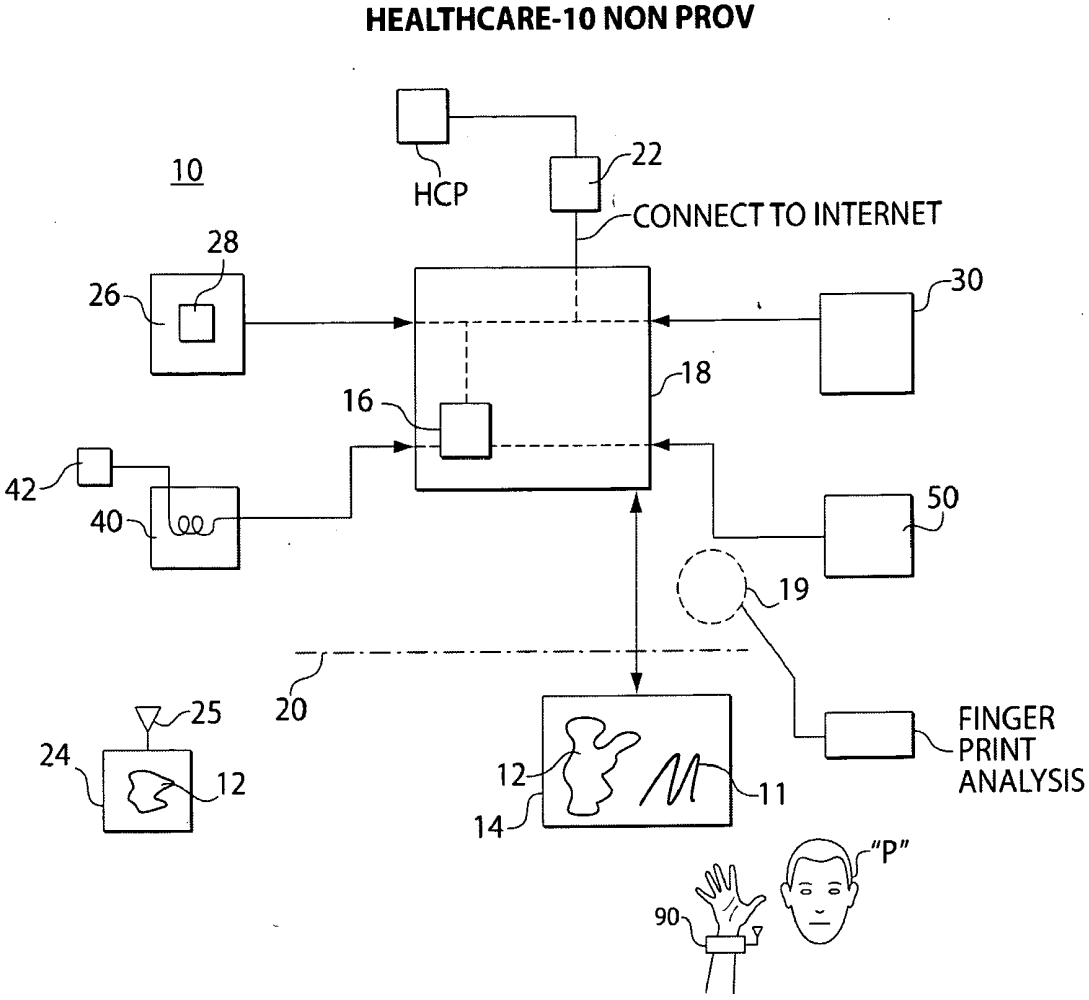
(57) **ABSTRACT**

An independently operable interactive health care monitoring and control system for the patient-responsive treatment and reporting from a home-based patient with respect to a health care provider treatment facility, the system comprising a patient or system activated "body-condition" test unit configured for personal recognition and interactive telecommunication with the health care provider treatment facility; and a patient-personalized, screen displayed, patient-respected computer generated avatar figure, to prompt and guide proper patient evaluation, reporting, behavior, behavior modification and treatment.



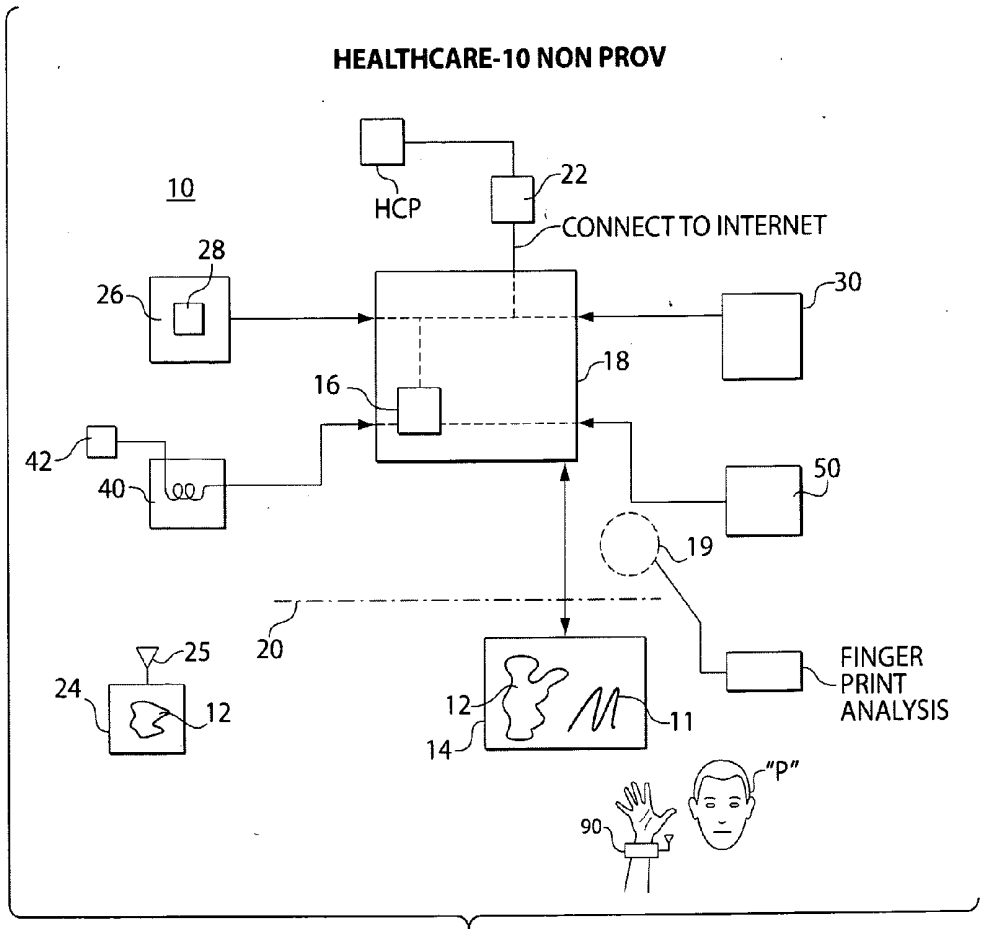

HEALTHCARE-10 NON PROV
10
HCP
22
CONNECT TO INTERNET
28
26
30
18
16
42
40
50
19
20
25
24
12
FINGER
PRINT
ANALYSIS
12
11
14
"P"
90

Fig. 1

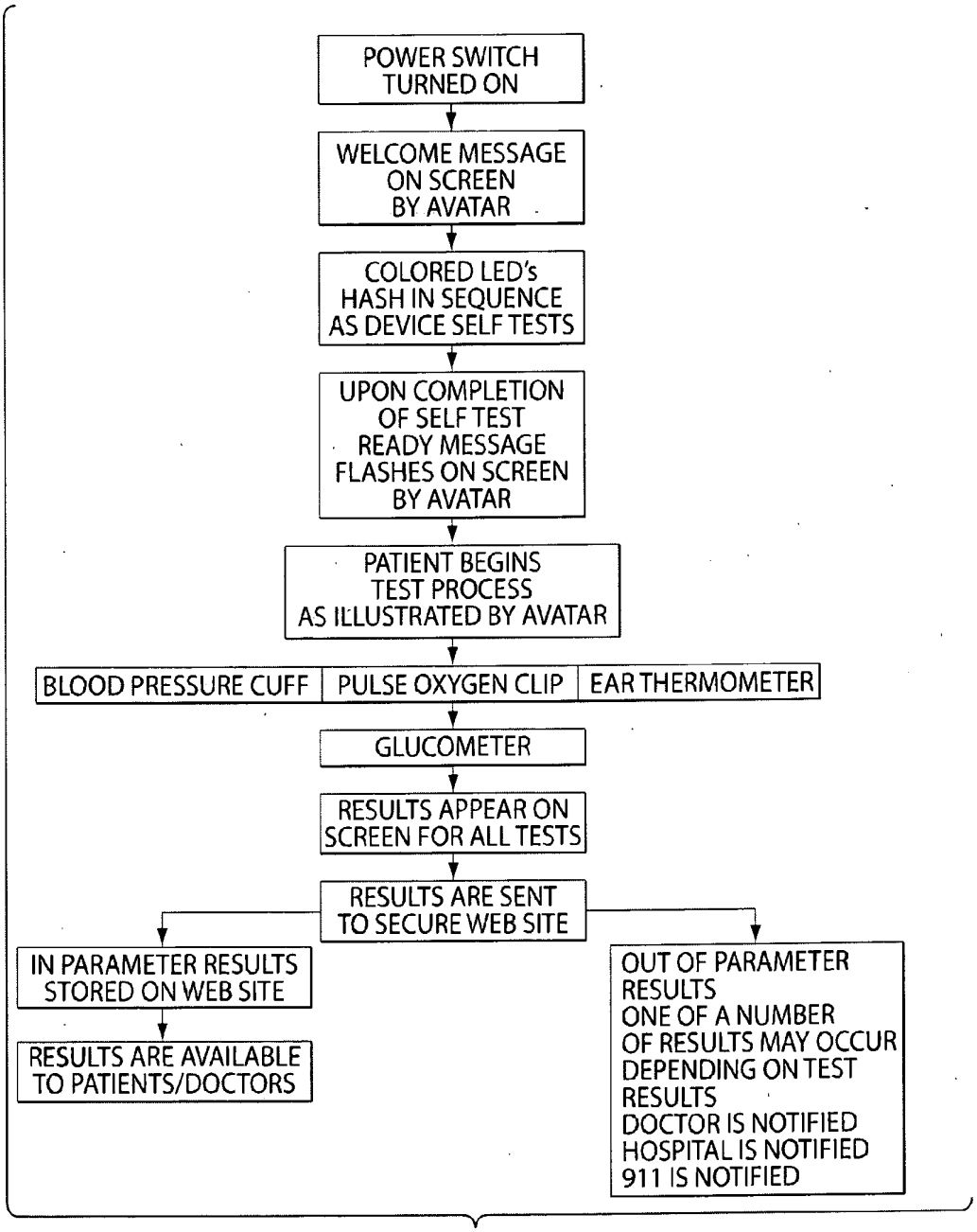

POWER SWITCH TURNED ON
WELCOME MESSAGE ON SCREEN BY AVATAR
COLORED LED's HASH IN SEQUENCE AS DEVICE SELF TESTS
UPON COMPLETION OF SELF TEST READY MESSAGE FLASHES ON SCREEN BY AVATAR
PATIENT BEGINS TEST PROCESS AS ILLUSTRATED BY AVATAR
BLOOD PRESSURE CUFF
PULSE OXYGEN CLIP
EAR THERMOMETER
GLUCOMETER
RESULTS APPEAR ON SCREEN FOR ALL TESTS
RESULTS ARE SENT TO SECURE WEB SITE
IN PARAMETER RESULTS STORED ON WEB SITE
RESULTS ARE AVAILABLE TO PATIENTS/DOCTORS
OUT OF PARAMETER RESULTS
ONE OF A NUMBER OF RESULTS MAY OCCUR DEPENDING ON TEST RESULTS
DOCTOR IS NOTIFIED
HOSPITAL IS NOTIFIED
911 IS NOTIFIED

Fig. 2

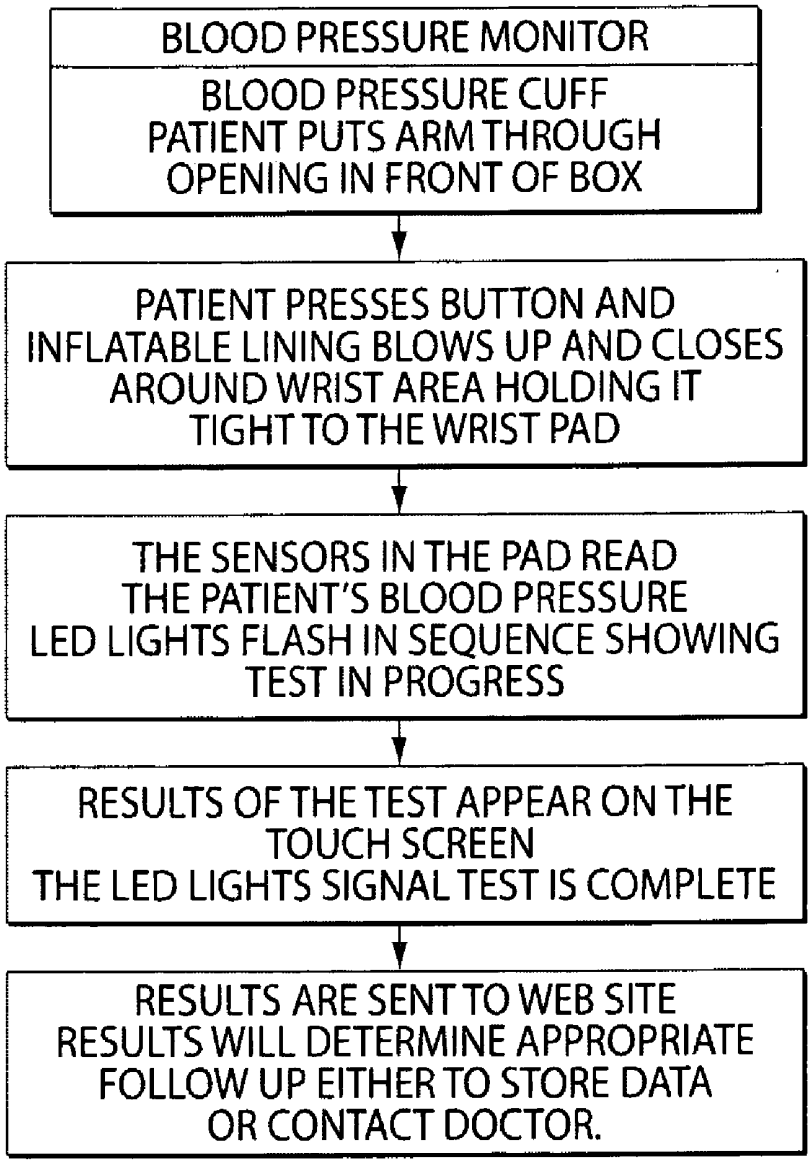

BLOOD PRESSURE MONITOR
BLOOD PRESSURE CUFF
PATIENT PUTS ARM THROUGH OPENING IN FRONT OF BOX
PATIENT PRESSES BUTTON AND INFLATABLE LINING BLOWS UP AND CLOSES AROUND WRIST AREA HOLDING IT TIGHT TO THE WRIST PAD
THE SENSORS IN THE PAD READ THE PATIENT'S BLOOD PRESSURE
LED LIGHTS FLASH IN SEQUENCE SHOWING TEST IN PROGRESS
RESULTS OF THE TEST APPEAR ON THE TOUCH SCREEN
THE LED LIGHTS SIGNAL TEST IS COMPLETE
RESULTS ARE SENT TO WEB SITE
RESULTS WILL DETERMINE APPROPRIATE FOLLOW UP EITHER TO STORE DATA OR CONTACT DOCTOR.

Fig. 3A

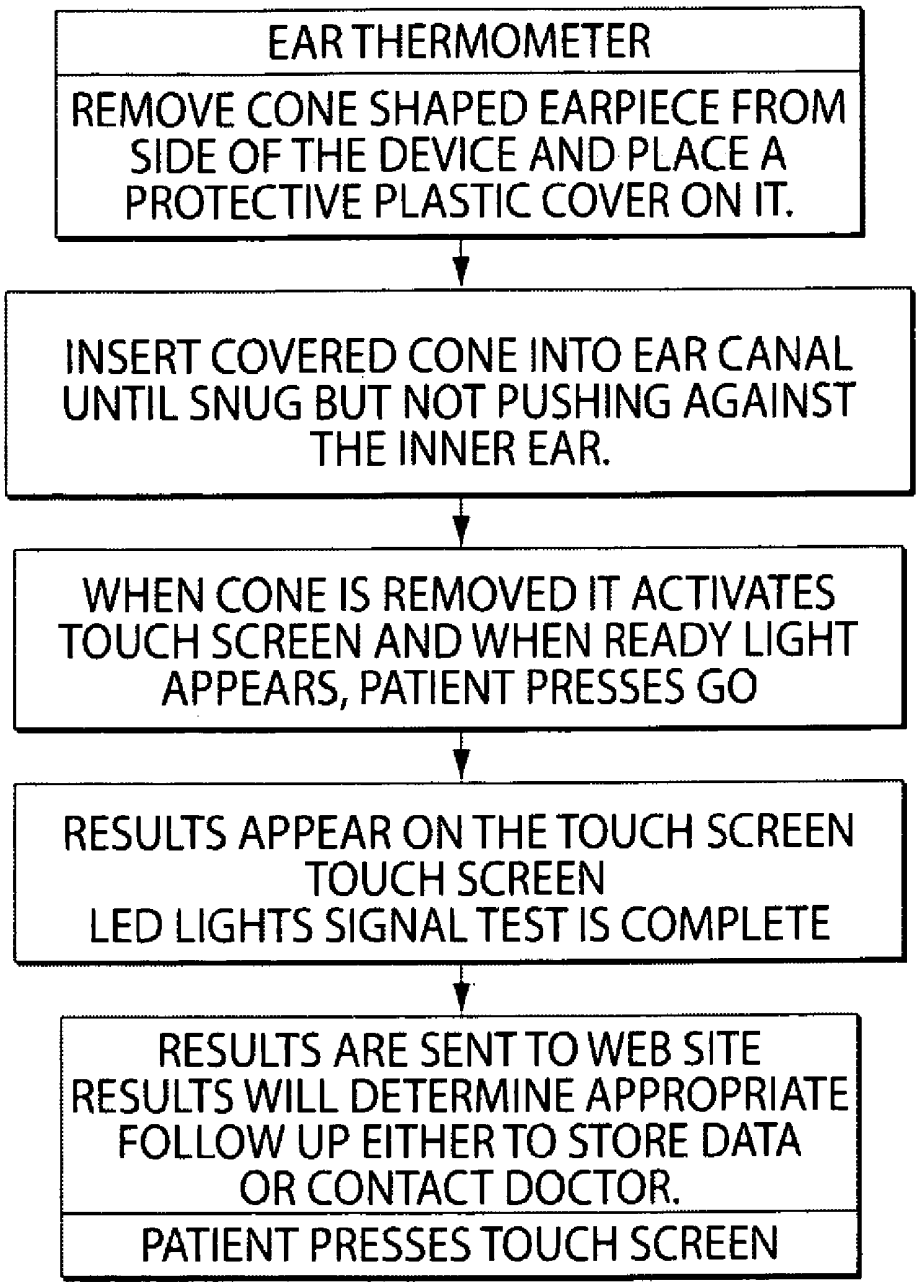

EAR THERMOMETER
REMOVE CONE SHAPED EARPIECE FROM SIDE OF THE DEVICE AND PLACE A PROTECTIVE PLASTIC COVER ON IT.
INSERT COVERED CONE INTO EAR CANAL UNTIL SNUG BUT NOT PUSHING AGAINST THE INNER EAR.
WHEN CONE IS REMOVED IT ACTIVATES TOUCH SCREEN AND WHEN READY LIGHT APPEARS, PATIENT PRESSES GO
RESULTS APPEAR ON THE TOUCH SCREEN
TOUCH SCREEN
LED LIGHTS SIGNAL TEST IS COMPLETE
RESULTS ARE SENT TO WEB SITE
RESULTS WILL DETERMINE APPROPRIATE FOLLOW UP EITHER TO STORE DATA OR CONTACT DOCTOR.
PATIENT PRESSES TOUCH SCREEN

Fig. 3B

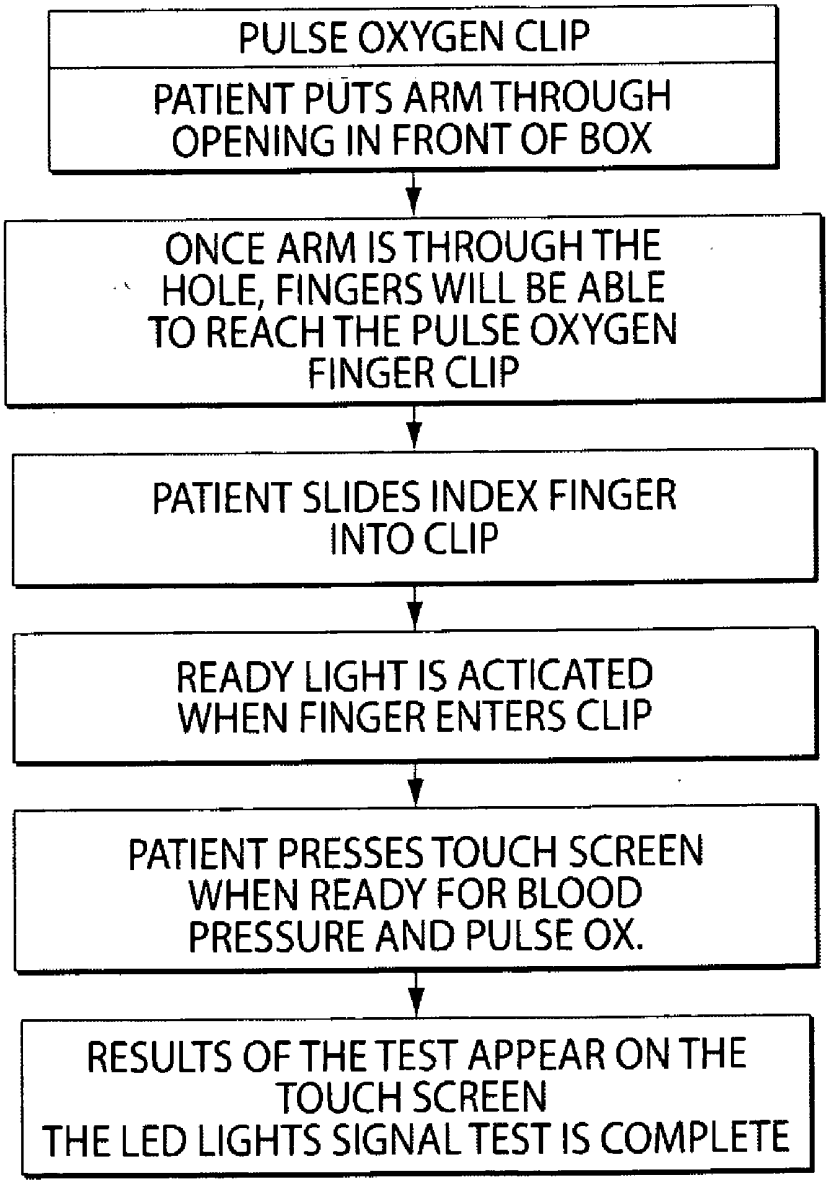

PULSE OXYGEN CLIP
PATIENT PUTS ARM THROUGH OPENING IN FRONT OF BOX
ONCE ARM IS THROUGH THE HOLE, FINGERS WILL BE ABLE TO REACH THE PULSE OXYGEN FINGER CLIP
PATIENT SLIDES INDEX FINGER INTO CLIP
READY LIGHT IS ACTICATED WHEN FINGER ENTERS CLIP
PATIENT PRESSES TOUCH SCREEN WHEN READY FOR BLOOD PRESSURE AND PULSE OX.
RESULTS OF THE TEST APPEAR ON THE TOUCH SCREEN
THE LED LIGHTS SIGNAL TEST IS COMPLETE

Fig. 3C

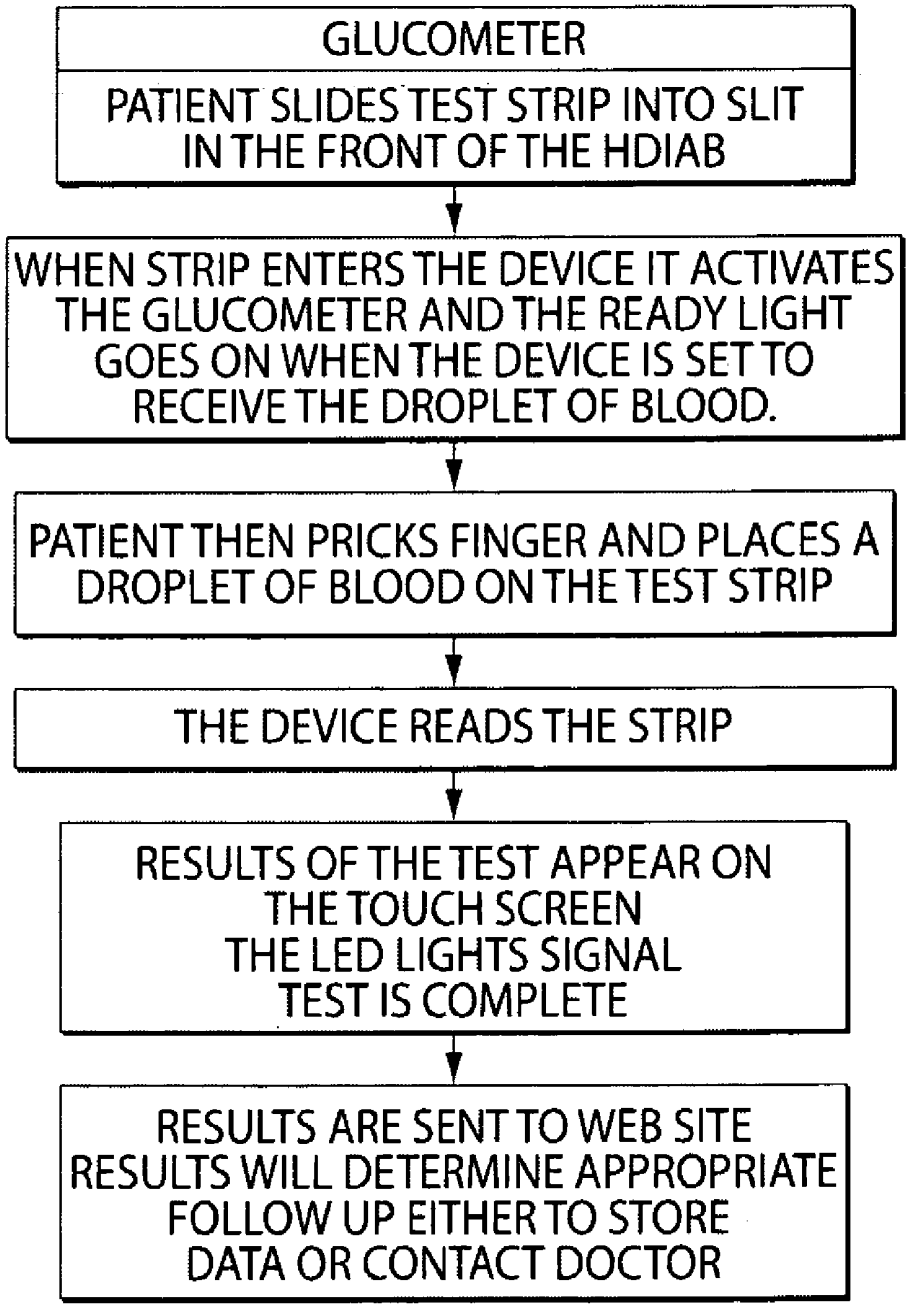

GLUCOMETER
PATIENT SLIDES TEST STRIP INTO SLIT IN THE FRONT OF THE HDIAB
WHEN STRIP ENTERS THE DEVICE IT ACTIVATES THE GLUCOMETER AND THE READY LIGHT GOES ON WHEN THE DEVICE IS SET TO RECEIVE THE DROPLET OF BLOOD.
PATIENT THEN PRICKS FINGER AND PLACES A DROPLET OF BLOOD ON THE TEST STRIP
THE DEVICE READS THE STRIP
RESULTS OF THE TEST APPEAR ON THE TOUCH SCREEN THE LED LIGHTS SIGNAL TEST IS COMPLETE
RESULTS ARE SENT TO WEB SITE RESULTS WILL DETERMINE APPROPRIATE FOLLOW UP EITHER TO STORE DATA OR CONTACT DOCTOR

Fig. 3D

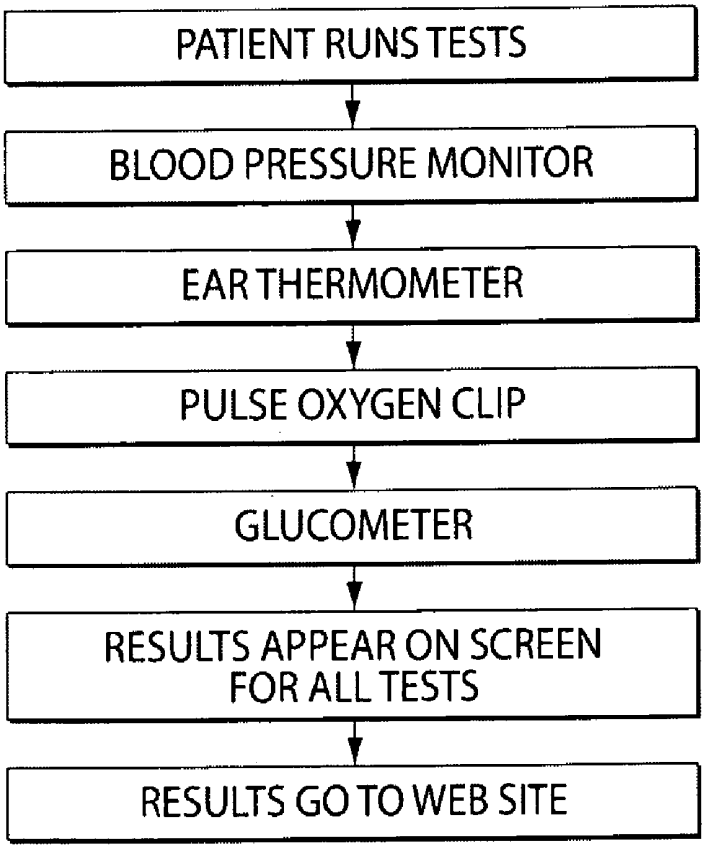

PATIENT RUNS TESTS
BLOOD PRESSURE MONITOR
EAR THERMOMETER
PULSE OXYGEN CLIP
GLUCOMETER
RESULTS APPEAR ON SCREEN FOR ALL TESTS
RESULTS GO TO WEB SITE

Fig. 4

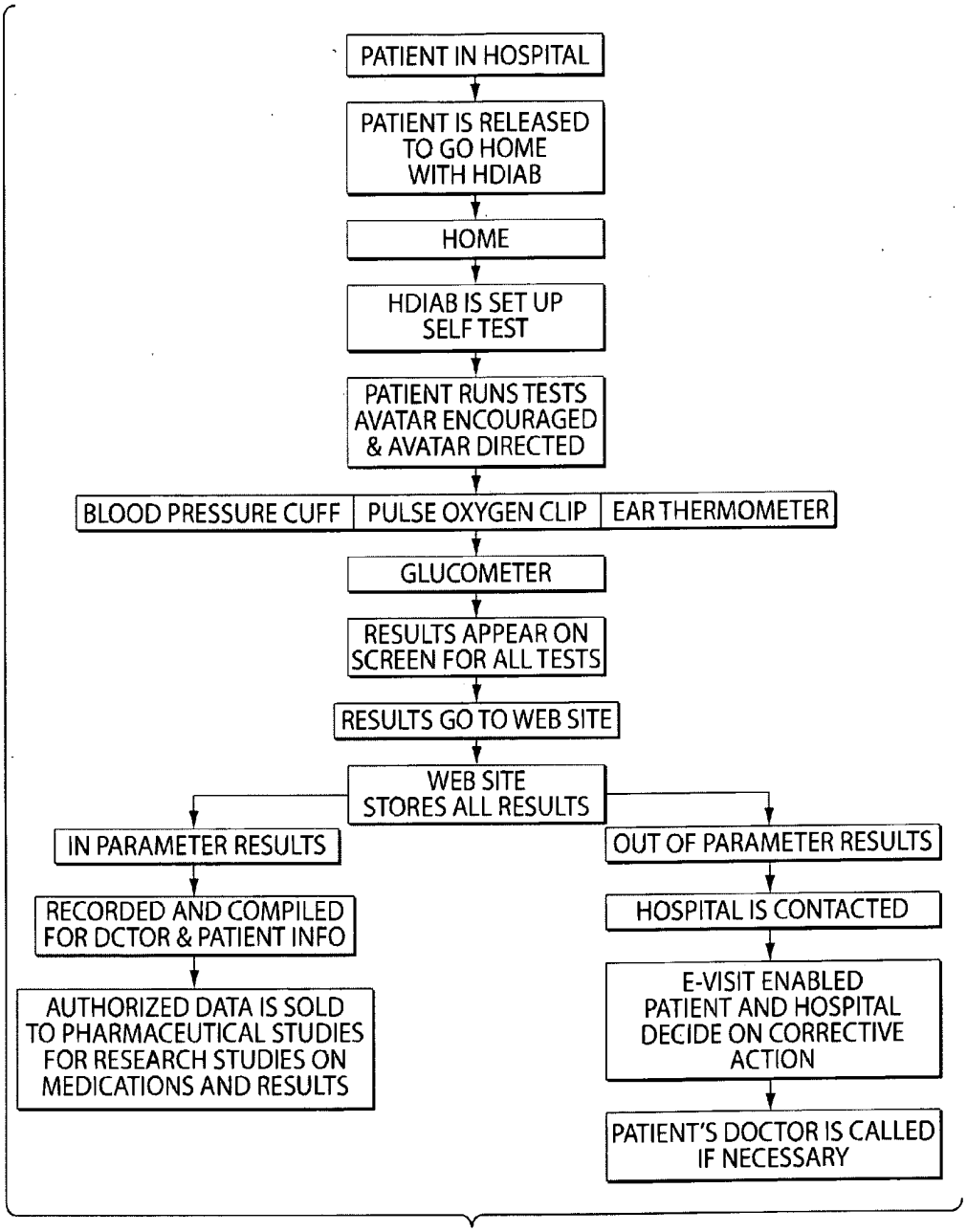

PATIENT IN HOSPITAL
PATIENT IS RELEASED TO GO HOME WITH HDIAB
HOME
HDIAB IS SET UP SELF TEST
PATIENT RUNS TESTS AVATAR ENCOURAGED & AVATAR DIRECTED
BLOOD PRESSURE CUFF
PULSE OXYGEN CLIP
EAR THERMOMETER
GLUCOMETER
RESULTS APPEAR ON SCREEN FOR ALL TESTS
RESULTS GO TO WEB SITE
WEB SITE STORES ALL RESULTS
IN PARAMETER RESULTS
RECORDED AND COMPILED FOR DCTOR & PATIENT INFO
AUTHORIZED DATA IS SOLD TO PHARMACEUTICAL STUDIES FOR RESEARCH STUDIES ON MEDICATIONS AND RESULTS
OUT OF PARAMETER RESULTS
HOSPITAL IS CONTACTED
E-VISIT ENABLED PATIENT AND HOSPITAL DECIDE ON CORRECTIVE ACTION
PATIENT'S DOCTOR IS CALLED IF NECESSARY

Fig. 5

PATIENT HEALTHCARE MONITORING/MAINTENANCE SYSTEM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates to patient health-monitoring systems and more particularly to systems using patient-developed avatar-arrangements for encouraging patient medical care-requirement-compliance, including arrangements for patient-reminding, overseeing, advising and communicating between medical personnel and patient, about a patient's health condition, and is based upon Provisional Patent Application Ser. No. 61/284,471, filed 17 Dec. 2009, and incorporated herein by reference, in its entirety.

[0003] 2. Prior Art Discussion

[0004] The field of patient monitoring is evolving as the need for health care is growing. There are currently over 110 million Americans having chronic illnesses who would benefit from an improved home based monitoring arrangement to facilitate improved healthcare.

[0005] The old standby of visiting nurses attending a patient's home, needs to be updated by the use of modern telecommunications. Telemedicine has been attempted over a period of years but has several shortcomings. Such telecommunication is common in hospital settings and emergency rooms and clinics, yet complete systems with home-based patient's still fall short of the desired level of service.

[0006] There is a need for a convenient accurate, home-based, patient-accessible and patient-interactive audiovisual communication system for patient monitoring and for patient-needs fulfillment connected between the patient and the caregiver.

[0007] There is also a need for a "friendly" and yet "demanding" patient "reminding" or patient "encouraging" system for motivating a patient to take the proper action when necessary, and to notify appropriate medical personnel when such action is not been undertaken.

BRIEF SUMMARY OF THE INVENTION

[0008] The present invention comprises a system for interacting with a patient in a home based patient-caregiver health monitoring and support system. The health monitoring and support system is arranged to be patient activated, or preferably automatically and independently, system-activated, self-administrated diagnostic procedures of, for example: blood pressure, pulse oxygen, blood glucose and body temperature. Once these self administered procedures have been accomplished by the patient, direct audiovisual communication between the healthcare provider and the patient is permitted/encouraged by the present system.

[0009] This regular support and mentoring/monitoring by the system, particularly of chronically ill or absent-minded patients, utilizes personality and character-individualized, specially created or specifically selected, highly patient-responsive, "atavaristic" reminders and persuaders to affect the patient to take his/her medications and use proper behavioral treatment. The system additionally, provides historic information on the patient's accumulated tests to date, to follow trends and events of that patient and his or her proper following of medical procedures.

[0010] The system is contained in a unitary primary structure or housing, for example, at bedside use within a patient's home, with satellite housings in wired or wireless communication with the primary housing, to continue a home-wide prompting, encouraging and reminding the patient, by one or more specifically favored or created avatars to enforce proper behavior and medication utilization. The system housing includes among other test and reporting devices and procedures, a blood pressure monitor test unit with its affiliated blood pressure cuff and blood pressure analysis circuit with input to the patient's telecommunication control unit.

[0011] The system also includes a pulse oxygen clip test unit. The pulse oxygen clip (oximeter) is in communication with the systems analysis circuit with input to the patient's telecommunication control unit, in timed, preferably sequentially programmed use with the blood pressure cuff.

[0012] The system also preferably includes a body thermometer test unit such as for example an ear thermometer. The body thermometer is in communication with the system's analysis circuit with input to the patient's telecommunication control unit.

[0013] The system may also include a glucometer test unit for receiving patient acquired blood test strips. The glucometer is in communication with the systems analysis circuit with input to the patient's telecommunication control unit.

[0014] The telecommunication control unit includes a patient and healthcare provided controllable video monitor with a touch screen on which instructions and preferred variable avatars appear as needed. Speakers adjacent the monitor may provide preprogrammed sound effects and/or verbal instructions to the patient. The monitor thus provides the desired, specially created and/or selected (variable) avatar for patient encouraging, motivating and instructional purposes. The video monitor and associated touch screen is arranged to instruct and receive responses from the patient relative to the various test units and their step wise procedures. The prompts generated by the avatars and received by the patient and the patient's responses to the selected avatar's prompts for appropriate test unit initiatives are communicated to the patient's healthcare provider preferably via the Internet or may be pre-programmed so as to present one or more of a range of variable "avatar personalities" desired or needed to get the point across and motivate the patient into proper behavior.

[0015] If the patient's responses are inadequate or the test unit results fall outside of the desired healthcare providers parameters, the inventive system and/or healthcare provider may automatically make changes to the avatar's character and persuasiveness needed for fulfilling the patient's required medical procedures or medicaments. Audio visual communication in addition to verbal or oral discussion may also be instituted between the patient and the healthcare provider upon certain test results communicated to the healthcare provider or upon failure of the patient to properly respond to or actually perform certain test units from the particular avatar or system prompts.

[0016] The system's use preferably begins with usage of the pulse oxygen clip being initiated when, in one aspect of the invention, the patient first puts his arm through the blood pressure cuff opening in the front of the housing. Once the arm is properly through the blood pressure cuff opening, the patient's fingers will be able to reach the pulse oxygen finger clip (oximeter). The patient is then instructed by the programmed avatar on the monitor to slide his index finger into the clip. A "ready light" may be activated by an actuation trigger mechanism in communication with the monitor when the finger is fully entered into the clip. The patient is then instructed by the personalized, patient-respected avatar on the

monitor, to touch the screen when the patient is ready for the pressure and pulse oxygen measurement to begin. The pulse oxygen clip functions within the index finger and the tests results appear on the touch screen. A test complete display light preferably appears on the monitor and the results are forwarded to the telecommunications portion of the system for further reporting to the healthcare provider as necessary.

[0017] Once a good pulse waveform has been received by the system, the blood pressure monitor test unit procedure begins, which procedure comprises the patient keeping his arm through the opening within the test unit, the system's proper computer automatically activating the appropriate inflation switch, preferably after an avatar greeting and any necessary prompting, wherein the inflatable pressure cuff blows up and closes around the arm or wrist area holding that cuff tight to the patient. A sensor arrangement in the cuff reads the patient's blood pressure and corroborates the heart rate picked up by the pulse oximeter. The blood pressure monitor test unit preferably includes an LED light display showing, when flashing, that a test is in progress. The electronic data received by the blood pressure monitor test unit is sent through the telecommunications unit to the healthcare provider's website for data storage, and/or to an alert at the medical providers' facility for a doctor's attention, or for a stronger, more detailed or aggressive message or instruction by a possibly character-changed avatar. A repeat pulse oximeter cross-check may be performed after the blood pressure analysis has been finished, to establish pattern accuracy, the reminder for such cross-check being prompted by the avatar, as necessary.

[0018] A further body condition test, such as for example, a body thermometer, such as an ear thermometer, is accomplished by insertion of, for example, a cone shaped ear piece into the ear canal from its support on the housing, prompted as needed by an avatar on one or more of the system monitors within the home. The touch screen on the monitor may be automatically actuated by the displacement of the ear thermometer from its support in the housing enclosure triggering a response through a proper circuit within the monitor. The patient presses the appropriate indicated location on the monitor's touch screen and LED lights indicate that the test is underway and or completed. The electronic data received by the body thermometer test unit is sent through the telecommunications unit to the healthcare provider's website for data storage or to alert someone at the medical provider's facility for a doctor's attention. The patient may be advised by an appropriate avatar on his monitor whether to take/follow certain medical procedures or not, depending upon the results of the particular test.

[0019] A glucometer may be initiated when the personalized avatar on the screen monitor prompts the patient to slide a glucose test strip into a test strip opening of the glucose test unit arranged within the housing of the system. The test strip opening preferably includes a trigger sensor which is activated when a test strip is inserted therein. The monitor then receives the triggered sensor's signal and effects a notice on the touch screen monitor for the patient to put his finger in place and deposit a droplet of blood onto the test strip. The glucometer meter then is instructed by the control unit to read the test strip and the glucose level results appear on the monitor's touch screen wherein LED lights signal that the test is complete. The test results are then automatically sent to the telecommunications unit of the system and to the healthcare provider for review if parameters so indicate.

[0020] The test results will also be presented to the patient by the avatar or displayed on the touch screen as appropriate graphical data so as to encourage the patient to maximize his self care and for him to reach the desired health care goals. The "goal" aspect will relate to improvement or deterioration information which will be utilized to encourage the patient to maximize his self-care, with the possibility of system wide interaction and/or competition with others of his demographic or his diagnosis. A further aspect of this procedure may be that prizes may be awarded by the healthcare provider, such as spa treatments or premium reductions for insurance or the like, to encourage healthy behavior. Such a data generated by such information may be able to be used for analysis of effectiveness of the healthcare treatment.

[0021] The incrementally variable or personality-advanceable or personality-selectable "avatar", a critical element of the invention, may appear in the form of the patient's physician, another person of authority, a representation of a member of the patient's family, a sports figure, a friend, a political figure, a historical figure, or a cartoon character, or the like, so as to induce the patient to be particularly responsible taking the tests and following though with the touch screen prompts. The avatar may be programmed or selected for various multiple levels of encouragement or persuasion, becoming more friendly or stern as needed depending upon the timing or non-completion of the patient's desired/required response.

[0022] The invention thus comprises a health care monitoring and control system for the patient-responsive treatment and reporting from a home-based patient with respect to a health care provider treatment facility, comprising: a patient activated or system activated "body-condition" test unit configured for personal recognition and interactive telecommunication with the health care provider treatment facility; and a patient-personalized, screen displayed, patient-respected computer generated avatar figure, to prompt and guide proper patient treatment. The "body-condition" test unit may comprise a test unit for measuring patient self-administered blood oxygen levels. The "body-condition" test unit may comprise a test unit for measuring patient self-administered blood pressure. The "body-condition" test unit may comprise a test unit for measuring patient self-administered body temperature. The "body-condition" test unit comprises a test unit for measuring patient self-administered glucose levels. The avatar figure is preferably generated by a computer source within the monitoring system or an interne source. The computer source preferably maintains a variable avatar collection to permit an avatar to show various or multiple stages of urgency to a patient utilizing the system, as required when patient compliance is not properly completed with certain preselected time intervals. The avatar is preferably selected from a group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a friend, a historical figure, a sport's figure, and a cartoon character.

[0023] The invention also may comprise a method of providing health care monitoring and health care support by a home based monitoring and healthcare support system comprising: arranging a patient-specific, patient-personalized, avatar-pre-programmed healthcare monitoring and control system for in-home use by a specific health impaired patient; initiating the system monitoring and support of a patient using the system by introduction of a patient's limb through a patient-receiving annular blood pressure monitoring cuff; guiding the patient through the monitoring and support procedure by a patient-identifiable avatar pre-selected by the

patient/healthcare provider, and represented on a monitor of the system; wherein the patient identifiable avatar is pre-selected by the patient from the group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a historic figure, a sport's figure, and a cartoon character, and wherein the healthcare monitoring system is in electronic communication and monitored by a professional healthcare agency; testing the patient's blood by a finger clip oximeter for an oximeter reading prior to reading the patient's blood pressure by the blood pressure monitoring cuff; testing the patient's blood pressure subsequent to the oximeter reading as prompted and instructed by the particular avatar character; reporting the results of the system's testing to a healthcare provider via an internet communication therewith; elevating the urgency expressed by the avatar in communication with the patient undergoing the test procedures if the system or the healthcare provider determines an improper or undesired result or condition has occurred; changing the avatar from one initially utilized to a different more forceful avatar should the system indicate a need to do so by its computer; and changing the avatar from one initially utilized by the system and shown on a monitor to the patient, to a different more forceful avatar shown subsequently to the patient on a monitor, should the system indicate a need to do so by the healthcare provider.

[0024] The invention may also comprise a method of providing health care monitoring and health care support by a home based monitoring and healthcare support system in the house of a patient, comprising: arranging a patient-specific, patient-personalized, avatar-pre-programmed healthcare monitoring and control system for in-home use by a specific health impaired patient; initiating the system monitoring and support of a patient using the system, by introduction of a patient's limb through a patient-receiving annular blood pressure monitoring cuff; and guiding the patient through the monitoring and support procedure by a patient-identifiable, avatar pre-selected by the patient/healthcare provider, and represented on a monitor of the system, wherein the patient identifiable avatar is pre-selected by the patient from the group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a historic figure, a sport's figure, and a cartoon character, and wherein the healthcare monitoring system is in electronic communication and monitored by a professional healthcare agency, and the steps of: testing the patient's blood by a finger clip oximeter for an oximeter reading prior to reading the patient's blood pressure by the blood pressure monitoring cuff; testing the patient's blood pressure subsequent to the oximeter reading as prompted and instructed by the particular avatar character; reporting the results of the system's testing to a healthcare provider via an internet communication therewith; elevating the urgency expressed by the avatar in communication with the patient undergoing the test procedures if the system or the healthcare provider determines an improper or undesired result or condition has occurred; changing the avatar from one initially utilized, to a different more forceful avatar should the system indicate a need to do so by the patient's response sensed by the system computer, or changing the avatar from one initially utilized by the system and shown on a monitor to the patient, to a different more forceful avatar shown subsequently to the patient on a monitor, should the system indicate a need to do so by the healthcare provider, and wherein the system includes satellite monitors selected from the group consisting of: wireless monitors in further rooms within the house of the patient, wireless monitors worn by the patient for receipt of avatar instruction.

DESCRIPTION OF FIGURES FOR PRESENT PATIENT ACTUATED HEALTH CARE SYSTEM

[0025] The objects and advantages of the present system will become more apparent when viewed in conjunction with the following drawings, in which:

[0026] FIG. **1** is a diagrammatic representation of the patient actuated health care system of the present invention;

[0027] FIG. **2** is a flowchart representing the general outline of the patient actuated health care system shown in FIG. **1**;

[0028] FIGS. **3**A, **3**B, **3**C and **3**D are flowcharts representing more particularly the procedures of the patient actuated health care system as it relates to a blood pressure monitoring arrangement, a body so monitor each of which being in communication with the telecommunications unit including the touch screen monitor;

[0029] FIG. **4** is a flowchart representing more particularly the procedures of the patient actuated health care system as it relates to blood pressure monitoring, ear temperature monitoring, blood oxygen clip testing, and glucose monitoring by a glucometer; and

[0030] FIG. **5** is a general flowchart representing the procedures utilized by a patient with the present health care monitoring system when that patient is released from a hospital and needs subsequent healthcare monitoring and guidance.

DETAILED DESCRIPTION OF THE INVENTION

[0031] Referring now to the drawings in detail and particularly to FIG. **1**, there is shown the present invention in which a system for interacting with a patient "P" in a home based patient-caregiver health monitoring and support system **10**. The health monitoring and support system **10** is arranged to be patient activated, or preferably automatically and independently system activated for the patient's self-administrated diagnostic procedures of, for example: blood pressure, pulse oxygen, blood glucose and body temperature, as represented in FIG. **2**, and represented more specifically in FIGS. **3**A, **3**B, **3**C, **3**D, **4** and **5**. Once these self administered procedures have been accomplished by the patient, with the assistance of personalized, preselected, action-encouraging avatars **12**, which are displayed on a patient's touch screen **11** on the monitor **14**, direct audiovisual communication between the health care provider HCP and the patient "P" is permitted/encouraged by the present system **10**.

[0032] This regular support and mentoring/monitoring by the assembled system **10**, represented schematically in FIG. **1**, particularly for chronically ill or absent-minded type patients, utilizes any of a wide variety of those avatars **12**, which are personality and character-individualized, specially created or specifically selected, highly patient-responsive, "atavaristic" reminders and persuaders to affect the patient to take his/her medications and use proper behavioral treatment. Those selectable, various situation-adaptable avatars **12**, are preferably generated from previous patient inquiries or patient histories, or created by proper software within the system **10** or by the health care provider HCP especially for the psychological nature of the particular patient, the avatars **12** preferably being stored within and retrievable from a proper computer memory **16** in the control unit **18**, in a primary housing **20**, or otherwise may be modified as needed,

and/or retrieved from a proper on-line internet source **22**. Each selectable pre-loaded or on-line available avatar **12** preferably has its own distinctive sound or audio presentation which is known to correspond to the particular avatar **12** (i.e.: friend, doctor, family member, sports figure etc.) selected by the patient P or by the computer **16** and/or control unit **18**. The system **10** additionally, provides historic information on the patient's accumulated tests to date, to follow trends and events of that patient and his or her proper following of medical procedures.

[0033] The system **10** is contained in a unitary primary structure or housing **20**, for example, at bedside use within a patient's home, with satellite housings **24** in wired or a wireless antenna **25** communication with the primary housing **20**, to continue a home-wide prompting, encouraging and reminding the patient, by one or more specifically favored or created avatars **12** to enforce proper behavior and medication utilization. The system housing **20** includes among other test and reporting devices and procedures, a blood pressure monitor test unit **26**, shown in FIG. **1**, the operational steps being represented in FIG. **3**A, with its affiliated blood pressure cuff and blood pressure analysis circuit **28** with proper input to the patient's telecommunication control unit **18**. A further aspect of the system **10** may include a wireless unit **90**, such as a radio frequency wrist watch-like prompter device carried by the patient on his person, to remind the patient by a miniaturized avatar with its respective audio admonition, to take his medications or to submit to testing via the system **10**.

[0034] The system **10** also preferably includes a pulse oxygen clip test unit **30**. The pulse oxygen clip (oximeter) **30** is in communication with the systems analysis circuit computer **16** through input to the patient's telecommunication control unit **18**, in timed, preferably sequentially programmed use with the blood pressure cuff.

[0035] The system **10** also preferably includes a body thermometer test unit **40** such as for example an ear thermometer **42**. The body thermometer **40** is in communication with the system's proper analysis circuit computer **16** though input to the patient's control unit **18** telecommunications.

[0036] The system **10** may also include a glucometer test unit **50** for receiving patient acquired blood test strips, not shown for clarity of viewing. The glucometer **50** is in communication with the systems computer analysis circuit **16** through input to the patient's control unit **18** telecommunications.

[0037] The control unit **18** telecommunication arrangement includes the patient and healthcare provided controllable video monitor **14** (and satellite unit(s) **24**) with a touch screen **11** on which the medical instructions, and the "preferred" avatars **12** appear as needed. Speakers (not shown) adjacent or with the monitor **14** may provide preprogrammed sound effects and/or verbal instructions to the patient. The monitors **14** and **24** thus provide the desired, specially created and/or selected avatar **12** for patient encouragement, motivation and instructional purposes. The video monitor **14** and associated touch screen **11** is arranged to instruct and receive responses from the patient "P" relative to the various test units **26**, **30**, **40** and **50**, represented in FIG. **1**, and their step wise procedures represented in FIGS. **3**A, **3**B, **3**C and **3**D.

[0038] The prompts generated by the avatar(s) **12** and received by the patient "P", and the patient's responses to the selected avatar's prompts for appropriate test unit initiatives are communicated to the patient's health care provider HCP preferably via the Internet as represented stepwise in FIGS. **1** and **4**. The computer **16** within the control unit **18** may be pre-programmed so as to present one or more of a range of "avatar personalities" desired or needed to get the point across and motivate the patient "P" into his/her proper medical behavior.

[0039] If the patient's responses are inadequate or the test unit results fall outside of the desired health care provider's parameters, the inventive system **10** and/or health care provider HCP may automatically make computer generated changes to the character of the avatar **12** (i.e. pushyness, domineering forcefulness or persuasiveness) needed for getting the patient to fulfill the patient's required medical procedures or take medicaments. Audio visual communication in addition to verbal or oral discussion may also be instituted between the patient and the healthcare provider upon certain test results communicated to the health care provider or upon failure of the patient to properly and timely respond to or actually perform certain test units from the particular avatar **12** or system prompts.

[0040] The system's use preferably begins with usage of the pulse oxygen clip **30** being initiated when the patient first puts his arm or limb through the arm or limb cuff opening **19** in the front of the housing **20**. Once the arm is through the cuff opening **19**, the patient's fingers will be able to reach the pulse oxygen finger clip **30** (oximeter). The patient is then automatically instructed by the programmed avatar **12** on the monitor **14** to slide his index finger into the clip oximeter **30**. A "ready light" (not shown for clarity of the figures) may be activated by a proper actuation trigger mechanism in communication with the monitor **14** when the finger is fully entered into the clip oximeter **30**. The patient "P" is then instructed by the personalized, patient-respected avatar **12** on the monitor **14** or **24**, (or **90**), to touch the screen **11** when the patient is ready for the pressure and pulse/oxygen measurement to begin. The pulse oxygen clip **30** functions with the index finger and the tests results appear on the touch screen. A test complete display light appears on the monitor **14** and the results are forwarded to the telecommunications portion of the system **10** for further reporting to the health care provider HCP, as necessary.

[0041] Once a good pulse waveform has been received by the system **10**, the blood pressure monitor test unit's **26** procedure then begins, which procedure comprises the patient keeping his (or her) limb or arm through the opening **19** within the test unit housing **20**, the system automatically initiating or the patient pressing the appropriate inflation switch (not shown for clarity of the figures) wherein the inflatable pressure cuff blows up and closes around the limb or wrist area holding that cuff tight to the limb or wrist. A sensor arrangement in the pad **28** reads the patient's blood pressure and corroborates the heart rate first picked up by the pulse oximeter **30**. The blood pressure monitor test unit **26** preferably includes a proper circuit of an LED light display, showing, when flashing, that a test is in progress. The electronic data received by the blood pressure monitor test unit **26** is sent through the computer **16** in the telecommunications unit to the health care provider's website for data storage, and or to an alert at the medical providers' facility for a doctor's attention at a professional healthcare provider's facility (doctor's office/hospital), or for a stronger, more detailed or aggressive message or instruction by a possibly "character-changed" and newly emboldened avatar **12** from the proper data source in the computer or pre-determined on-line source. A repeat pulse oximeter cross-check may be performed after

the blood pressure analysis has been finished, to establish pattern accuracy, the reminder for such cross-check being prompted by the avatar, as necessary.

[0042] A body thermometer, for example, an ear thermometer **42**, may be accomplished by insertion of, for example, a proper cone shaped ear piece into the ear canal from its support on the housing **20**, prompted as needed by an avatar **12** on one or more of the system monitors **14** or **24** within the home. The touch screen **11** on the monitor **14** may be automatically actuated by the displacement of the ear thermometer from its support in the housing enclosure, triggering a response through a proper circuit within the monitor **14**. The patient presses the appropriate indicated location on the touch screen **11** of the monitor **14**, and proper LED lights (not shown for clarity of viewing) may be arranged to indicate that the test is underway and or completed. The electronic data received by the body thermometer test unit **40** is properly sent through the telecommunications unit computer **16** to the website of the health care provider HCP for data storage or to alert someone at the medical provider's facility for a doctor's attention. The patient P may be advised by an appropriate (new or patient-familiar) avatar **12** on his monitor **14** or **24** whether to take/follow certain medical procedures or not, depending upon the results of the particular test.

[0043] A glucometer **50**, represented in FIG. **1**, may be initiated when the personalized avatar **12** on the screen **11** of the monitor **14** prompts the patient P to slide a glucose test strip into a test strip opening (not shown for clarity of the figures) of the glucose test unit arranged within the housing **20** of the system **10**. The test strip opening preferably includes a trigger sensor which is activated when a test strip is inserted therein. The monitor **14** then receives the triggered sensor's proper signal and effects a notice on the touch screen **11** of the monitor **14** for the patient "P" to put his finger in place and deposit a droplet of blood onto the test strip. The glucometer unit **50** then is instructed by the computer **16** in the control unit **18** to read the test strip and the glucose level results appear on the touch screen **11** of the monitor **14** wherein a proper circuit of LED lights (not shown for clarity of viewing) signal that the test is complete. The test results are then automatically sent through the computer **16** of the telecommunications unit **18** of the system **10** and to the health care provider HCP for review if parameters so indicate.

[0044] The "avatar" **12** may be computer generated so as to appear in the form of the patient's physician, or another person of authority, or possibly a representation of a member of the patient's family, a member of the clergy, a sports figure or political figure, or a cartoon character, so as to induce the patient P to be particularly responsible taking the tests and following though with the touch screen prompts. The avatar **12** may also be programmed for multiple levels of encouragement or persuasion, becoming more friendly or stern as needed, depending upon the timing and/or non-completion of the patient's desired/required response.

We claim:

1. A health care monitoring and control system for the patient-responsive treatment and reporting from a home-based patient with respect to monitoring by a health care provider treatment facility, comprising:

an activatable "body-condition" test unit configured for personal recognition and interactive telecommunication with the health care provider treatment facility; and

a patient-personalized, screen displayed, patient-respected, computer generated avatar figure, to visually and audibly prompt and guide proper patient responsive self-treatment.

2. The health care monitoring system as recited in claim **1**, wherein the "body-condition" test unit comprises a test unit for measuring patient self-administered blood oxygen levels.

3. The health care monitoring system as recited in claim **1**, wherein the "body-condition" test unit comprises a test unit for measuring patient self-administered blood pressure test.

4. The health care monitoring system as recited in claim **1**, wherein the "body-condition" test unit comprises a test unit for measuring patient self-administered body temperature.

5. The health care monitoring system as recited in claim **1**, wherein the "body-condition" test unit comprises a test unit for measuring patient self-administered glucose levels.

6. The health care monitoring system as recited in claim **1**, wherein the avatar figure is generated by a computer source within the monitoring system.

7. The health care monitoring system as recited in claim **6**, wherein the computer source maintains a variable avatar collection to permit the avatar to show multiple stages of urgency to a patient utilizing the system, as required when patient compliance is not properly completed with certain preselected time intervals.

8. The health care monitoring system as recited in claim **7**, wherein the avatar is selected from a group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a historical figure, a political figure, a sport's figure, a friend, and a cartoon character.

9. A health care monitoring and control system for the patient-responsive/non-responsive treatment and reporting from a home-based patient with respect to a health care provider treatment facility, consisting of:

a patient/system activated "body-condition" test unit configured for personal recognition and interactive telecommunication with the health care provider treatment facility; and

a patient-personalized, screen displayed, patient-respected computer generated avatar figure, to prompt and guide proper patient treatment, wherein the avatar is selected from a group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a historic figure, a sport's figure, and a cartoon character.

10. A method of providing health care monitoring and health care support by a home based monitoring and healthcare support system comprising:

arranging a patient-specific, patient-personalized, avatar-pre-programmed healthcare monitoring and control system for in-home use by a specific health impaired patient;

initiating the system monitoring and support of a patient using the system, by introduction of a patient's limb through a patient-receiving annular blood pressure monitoring cuff;

guiding the patient through the monitoring and support procedure by a patient-identifiable avatar pre-selected by the patient/healthcare provider, and represented on a monitor of the system; wherein the patient identifiable avatar is pre-selected by the patient from the group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a historic figure, a sport's figure, and a cartoon character,

and wherein the healthcare monitoring system is in electronic communication and monitored by a professional healthcare agency;

testing the patient's blood by a finger clip oximeter for an oximeter reading prior to reading the patient's blood pressure by the blood pressure monitoring cuff;

testing the patient's blood pressure subsequent to the oximeter reading as prompted and instructed by the particular avatar character;

reporting the results of the system's testing to a healthcare provider via an internet communication therewith;

elevating the urgency expressed by the avatar in communication with the patient undergoing the test procedures if the system or the healthcare provider determines an improper or undesired result or condition has occurred;

changing the avatar from one initially utilized to a different more forceful avatar should the system indicate a need to do so by its computer; and

changing the avatar from one initially utilized by the system and shown on a monitor to the patient, to a different more forceful avatar shown subsequently to the patient on a monitor, should the system indicate a need to do so by the healthcare provider.

11. A method of providing health care monitoring and health care support by a home based monitoring and healthcare support system in the house of a patient, comprising:

arranging a patient-specific, patient-personalized, avatar-pre-programmed healthcare monitoring and control system for in-home use by a specific health impaired patient;

initiating the system monitoring and support of a patient using the system, by introduction of a patient's limb through a patient-receiving annular blood pressure monitoring cuff; and

guiding the patient through the monitoring and support procedure by a patient-identifiable, avatar pre-selected by the patient/healthcare provider, and represented on a monitor of the system.

12. The method as recited in claim **11**, wherein the patient identifiable avatar is pre-selected by the patient from the group consisting of: one or more of the patient's family members, the patient's medical support team, a religious figure, a historic figure, a sport's figure, and a cartoon character.

13. The method as recited in claim **11**, wherein the healthcare monitoring system is in electronic communication and monitored by a professional healthcare agency.

14. The method as recited in claim **11**, including:

testing the patient's blood by a finger clip oximeter for an oximeter reading prior to reading the patient's blood pressure by the blood pressure monitoring cuff.

15. The method as recited in claim **14**, including:

testing the patient's blood pressure subsequent to the oximeter reading as prompted and instructed by the particular avatar character.

16. The method as recited in claim **15**, including:

reporting the results of the system's testing to a healthcare provider via an internet communication therewith.

17. The method as recited in claim **15**, including:

elevating the urgency expressed by the avatar in communication with the patient undergoing the test procedures if the system or the healthcare provider determines an improper or undesired result or condition has occurred.

18. The method as recited in claim **17**, including:

changing the avatar from one initially utilized, to a different more forceful avatar should the system indicate a need to do so by the patient's response sensed by the system computer.

19. The method as recited in claim **18**, including:

changing the avatar from one initially utilized by the system and shown on a monitor to the patient, to a different more forceful avatar shown subsequently to the patient on a monitor, should the system indicate a need to do so by the healthcare provider.

20. The method as recited in claim **11**, wherein the system includes satellite monitors selected from the group consisting of: wireless monitors in further rooms within the house of the patient, wireless monitors worn by the patient for receipt of avatar instruction.

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专利名称(译)	患者保健监测/维护系统		
公开(公告)号	US20110213218A1	公开(公告)日	2011-09-01
申请号	US12/928794	申请日	2010-12-17
[标]申请(专利权)人(译)	WEINER一个BERT GOODMAN的标记S		
申请(专利权)人(译)	WEINER一个BERT GOODMAN的标记S		
当前申请(专利权)人(译)	WEINER一个BERT GOODMAN的标记S		
[标]发明人	WEINER BERT A GOODMAN MARK S		
发明人	WEINER, BERT A. GOODMAN, MARK S.		
IPC分类号	A61B5/00		
CPC分类号	A61B5/0002 A61B5/0008 A61B5/01 A61B5/021 A61B5/024 G06F19/3468 A61B5/14542 A61B5/744 A61B2562/0295 G06F19/3406 G06F19/3418 A61B5/14532 A61B5/7465 G16H40/63 G16H40/67		
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摘要(译)

一种可独立操作的交互式医疗监护和控制系统，用于患者响应性治疗和来自基于家庭的患者相对于医疗保健提供者治疗设施的报告，该系统包括患者或系统激活的“身体状况”测试单元，与医疗服务提供者治疗机构进行个人识别和互动通信;以及患者个性化，屏幕显示，患者尊重的计算机生成的化身图形，以提示和指导适当的患者评估，报告，行为，行为改变和治疗。