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Rzadkiewicz et al.

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(45) **Date of Patent: Feb. 14, 2012**

(54) **ELECTRONIC HEALTH RECORD SYSTEM AND METHOD FOR AN UNDERSERVED POPULATION**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 390 days.

(21) Appl. No.: **12/290,475**

(22) Filed: **Oct. 31, 2008**

(51) **Int. Cl.**
G06F 19/00 (2011.01)

(52) **U.S. Cl.** **705/3**; 600/300; 710/73

(58) **Field of Classification Search** 705/3; 1/1; 600/300; 710/73

See application file for complete search history.

(56) **References Cited**

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5,169,342	A		12/1992	Steele et al.
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6,314,405	B1		11/2001	Richardson
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2007/0294113	A1	*	12/2007	Settimi 705/3

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Dyan R. Blewitt, MS, G. Octo Barnett M.D., Henry C. Chueh, M.D., M.S., Laboratory of Computer Science, Massachusetts General Hospital, Boston, MA, 1999, AMIA.*
Dialog search history.*

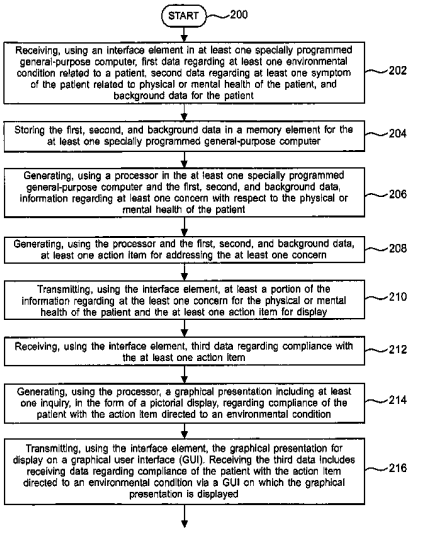
* cited by examiner

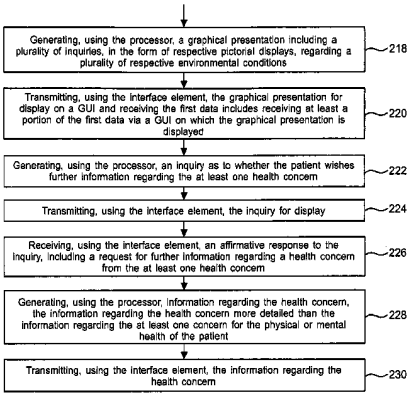
Primary Examiner — Dilek B Cobanoglu
(74) *Attorney, Agent, or Firm* — Simpson & Simpson, PLLC

(57) **ABSTRACT**

A system for managing electronic health records, including: an interface element in at least one specially programmed general-purpose computer for receiving data regarding at least one environmental condition, at least one symptom related to physical or mental health, and background for the patient; a memory element for the computer for storing the data; and a processor in the computer for: generating, using the data, information regarding at least one concern with respect to the physical or mental health of the patient; and generating, using the data, at least one action item for addressing the at least one concern. The interface element is for transmitting at least a portion of the information regarding the at least one concern for the physical or mental health of the patient and the at least one action item for display and receiving data regarding compliance with the at least one action item.

12 Claims, 22 Drawing Sheets





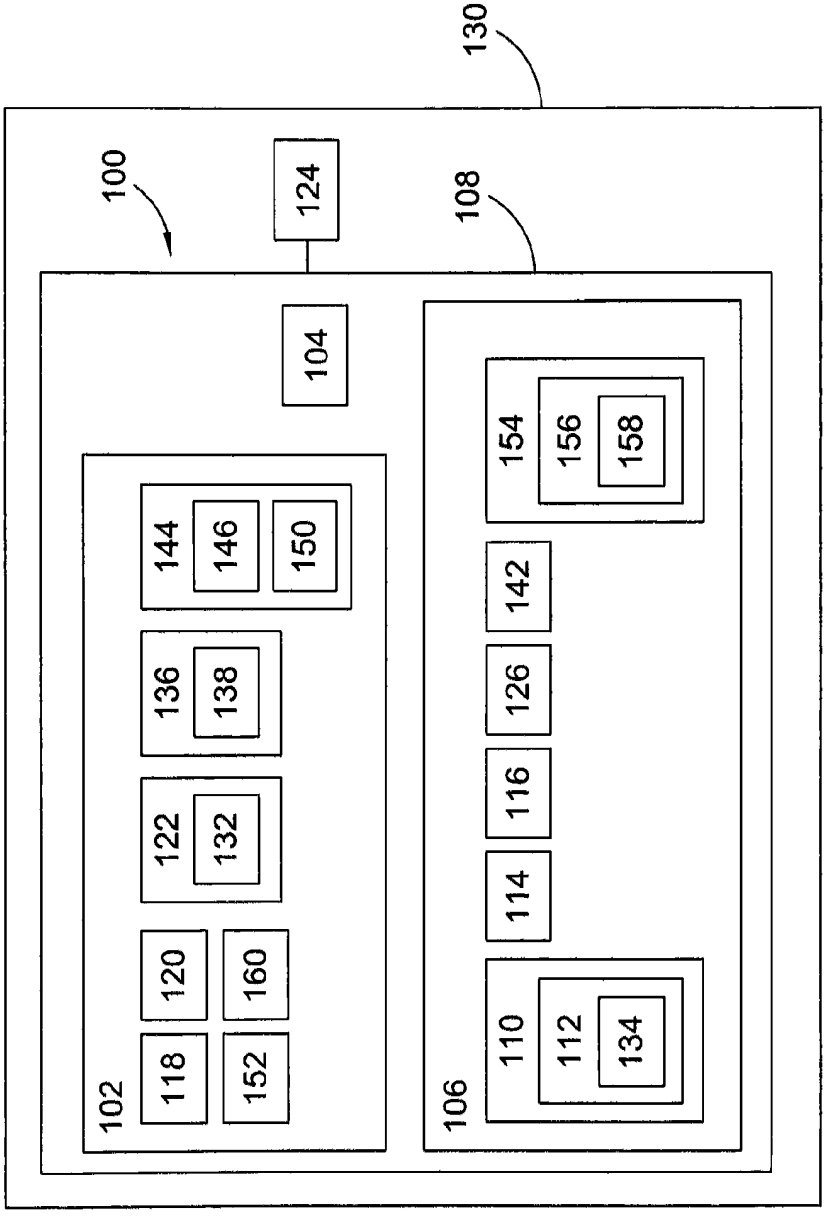

130
100
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Fig. 1

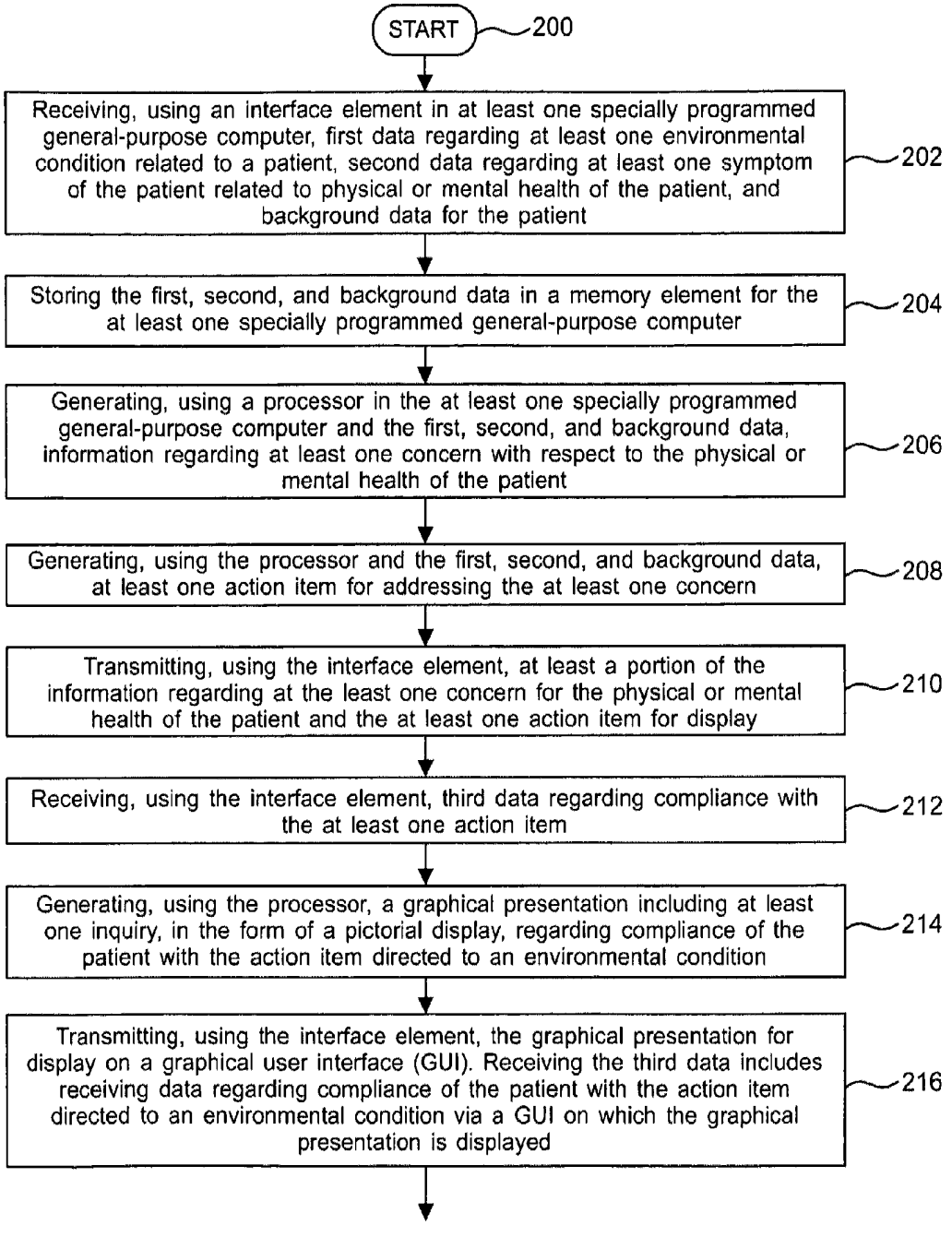

START
200
Receiving, using an interface element in at least one specially programmed general-purpose computer, first data regarding at least one environmental condition related to a patient, second data regarding at least one symptom of the patient related to physical or mental health of the patient, and background data for the patient
202
Storing the first, second, and background data in a memory element for the at least one specially programmed general-purpose computer
204
Generating, using a processor in the at least one specially programmed general-purpose computer and the first, second, and background data, information regarding at least one concern with respect to the physical or mental health of the patient
206
Generating, using the processor and the first, second, and background data, at least one action item for addressing the at least one concern
208
Transmitting, using the interface element, at least a portion of the information regarding at the least one concern for the physical or mental health of the patient and the at least one action item for display
210
Receiving, using the interface element, third data regarding compliance with the at least one action item
212
Generating, using the processor, a graphical presentation including at least one inquiry, in the form of a pictorial display, regarding compliance of the patient with the action item directed to an environmental condition
214
Transmitting, using the interface element, the graphical presentation for display on a graphical user interface (GUI). Receiving the third data includes receiving data regarding compliance of the patient with the action item directed to an environmental condition via a GUI on which the graphical presentation is displayed
216

Fig. 2

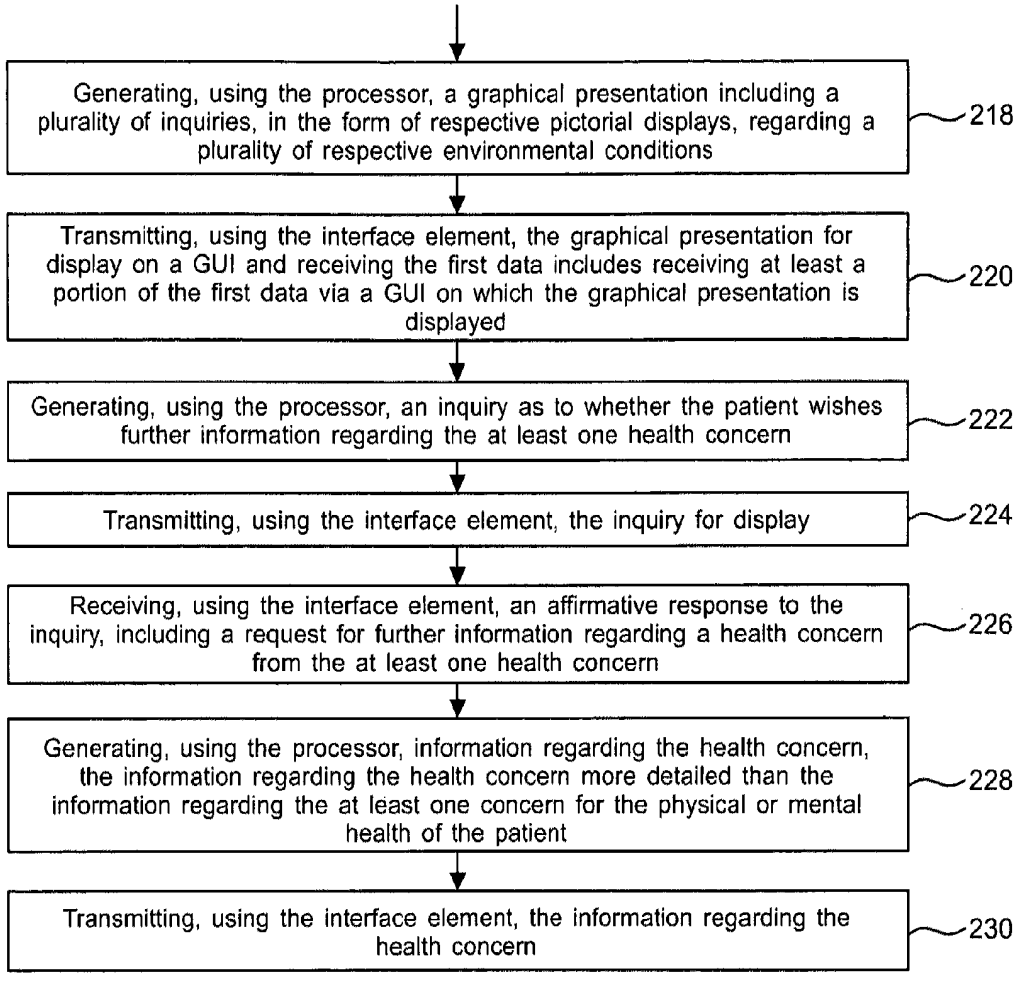


Fig. 2 (continued)

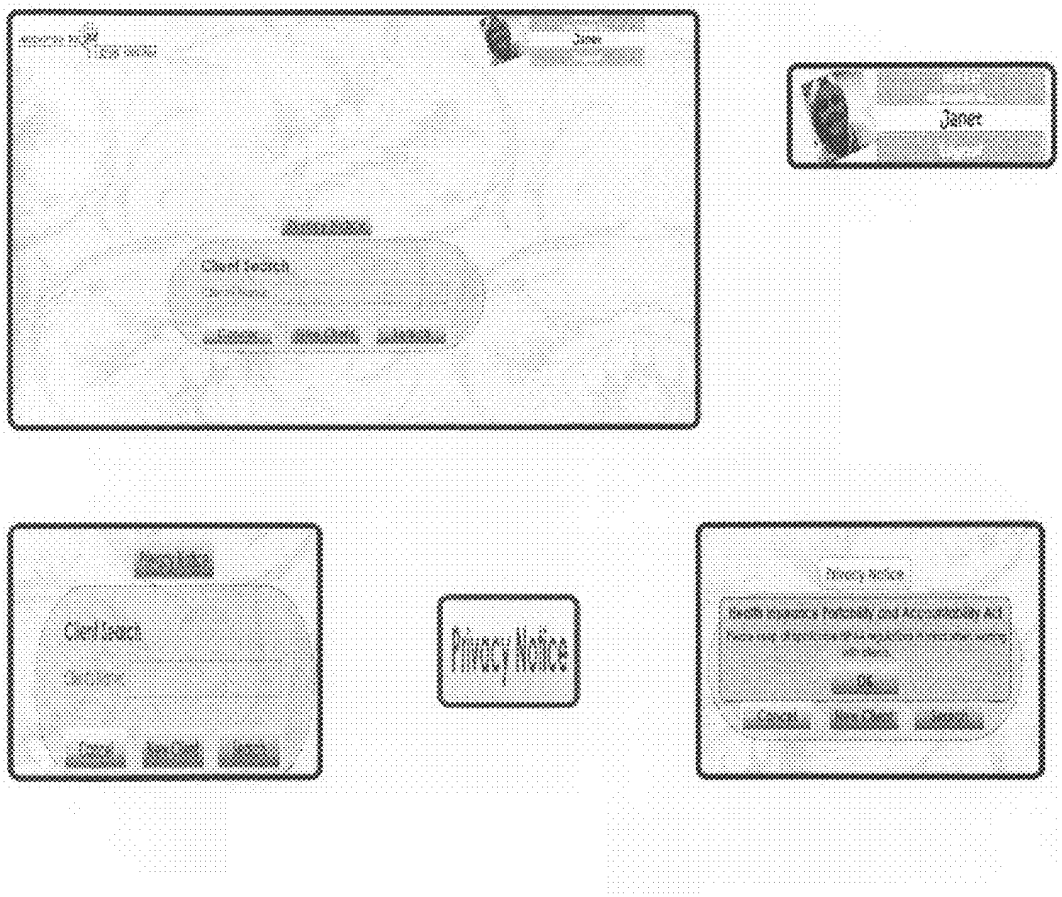


Fig. 3

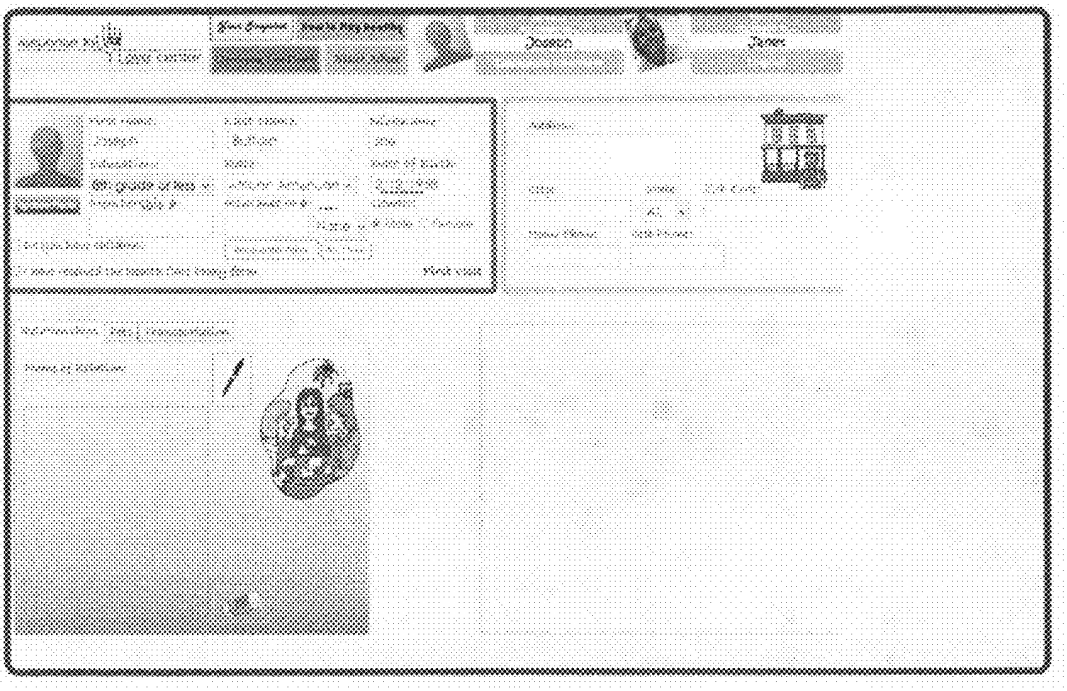


Fig. 4

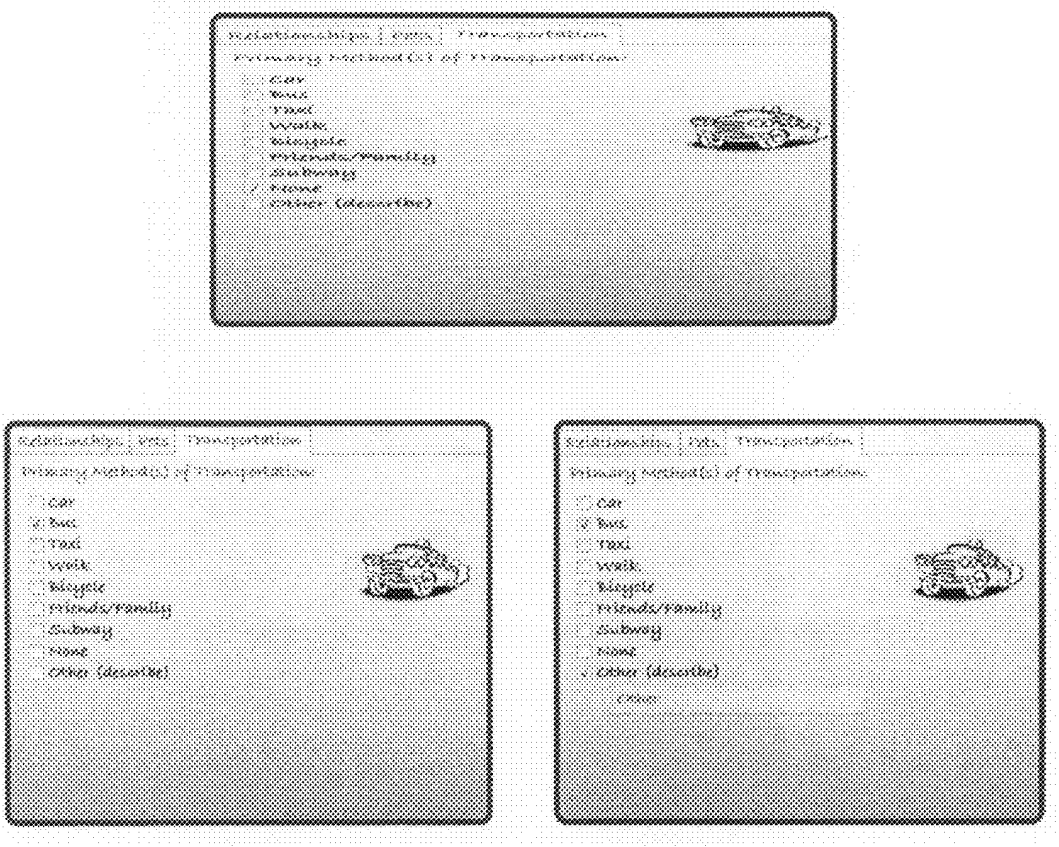


Fig. 5

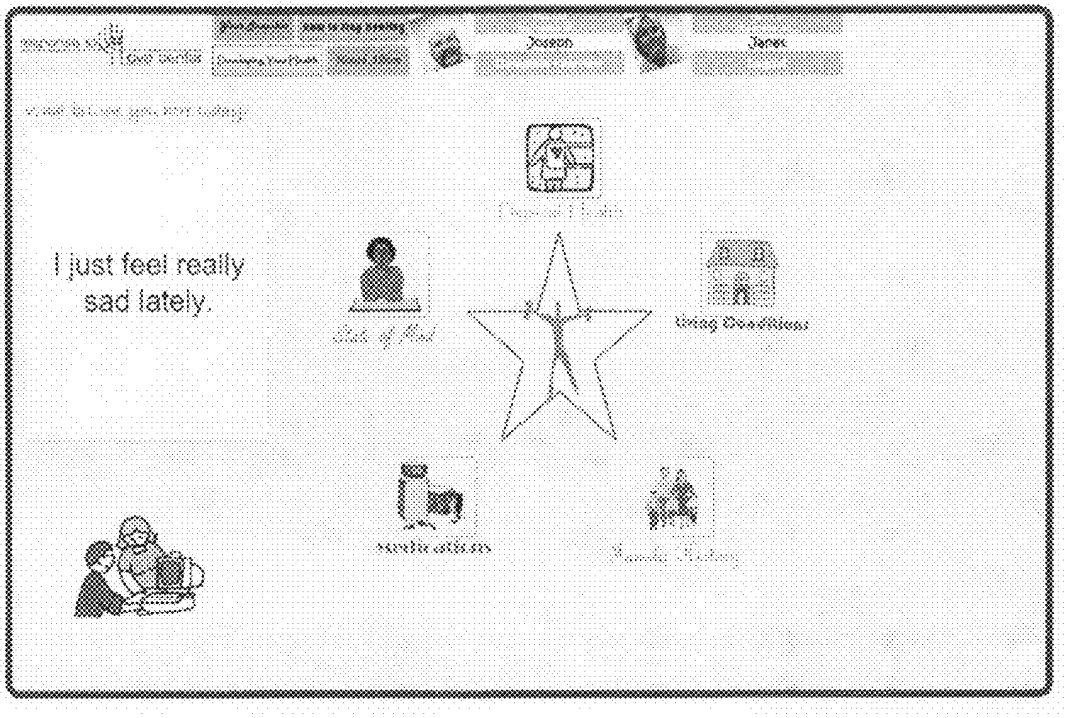


Fig. 6

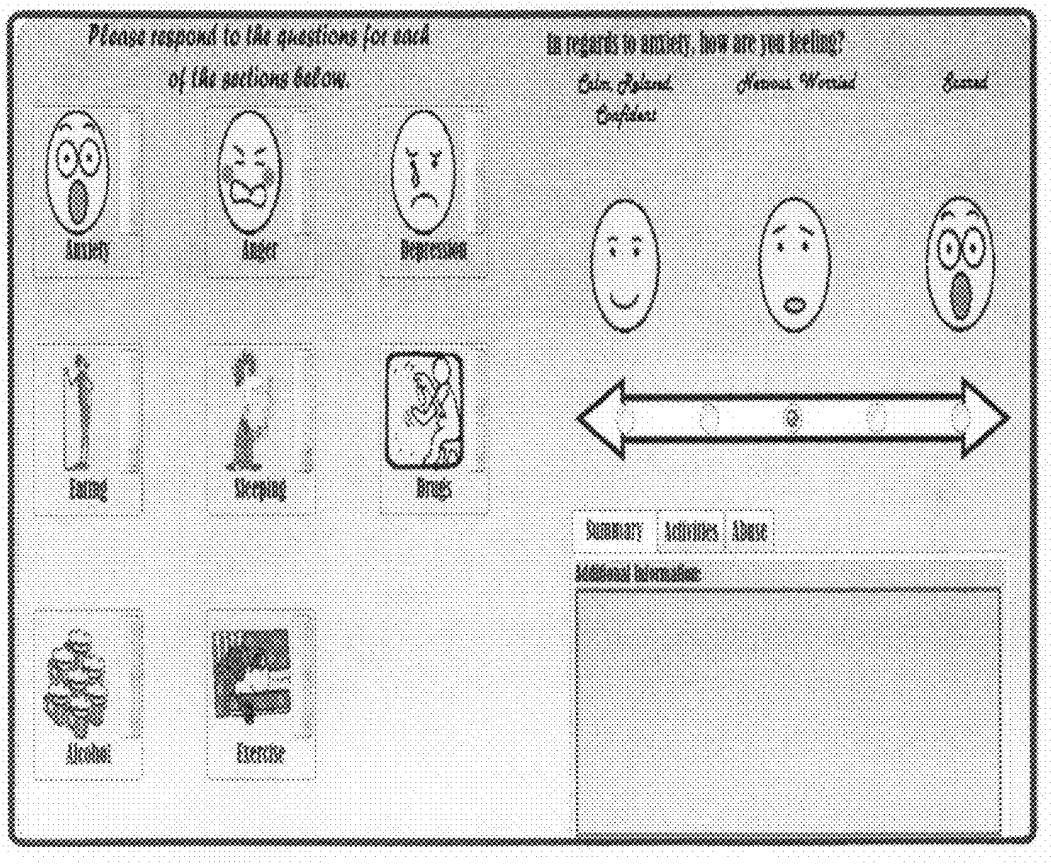

Please respond to the questions for each of the sections below.
In regards to anxiety, how are you feeling?
Calm, Relaxed, Confident
Anxious, Worried
Scared
Anxiety
Anger
Depression
Eating
Sleeping
Drugs
Summary
Activities
Share
Additional Information
Alcohol
Exercise

Fig. 7

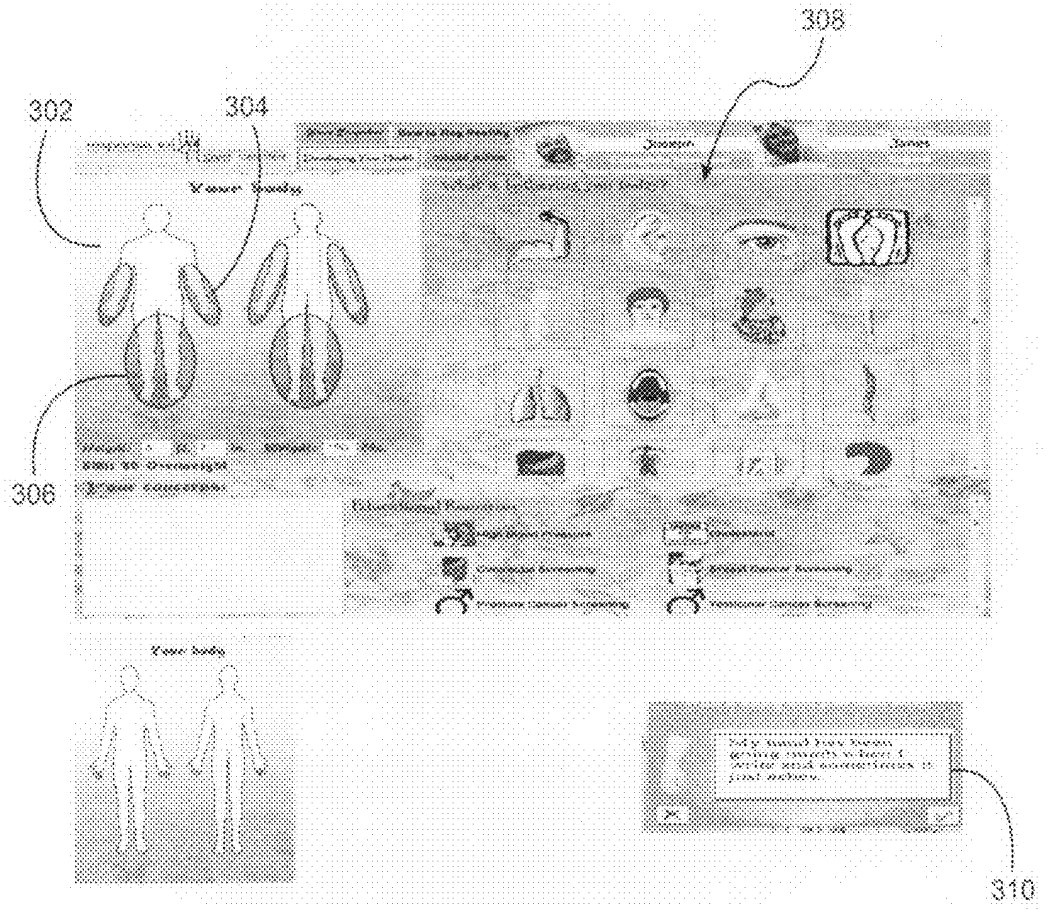


Fig. 8

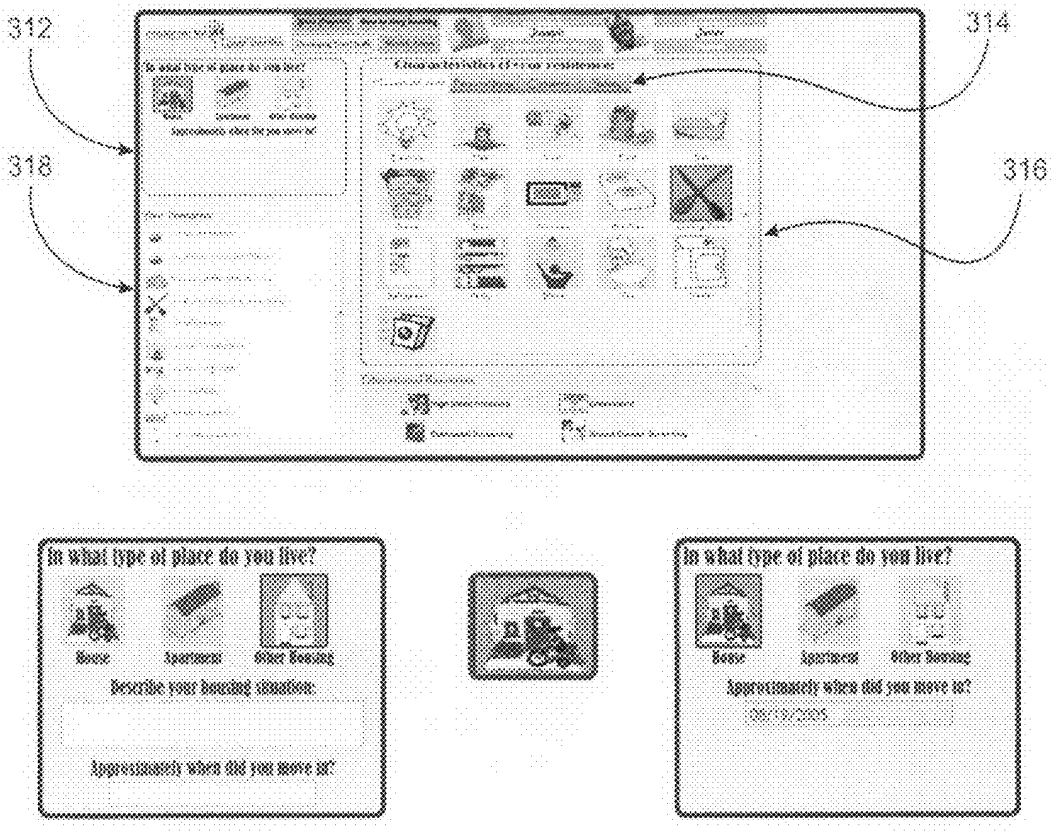

312
314
318
316
In what type of place do you live?
In what type of place do you live?

Fig. 9

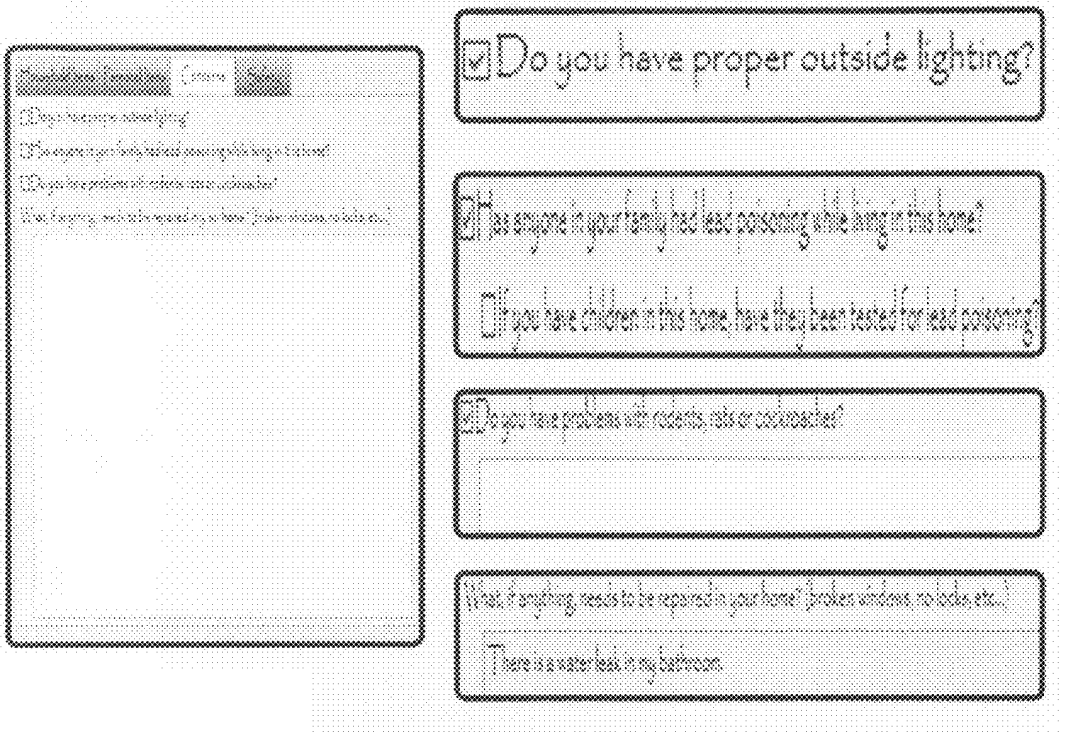


Fig. 10

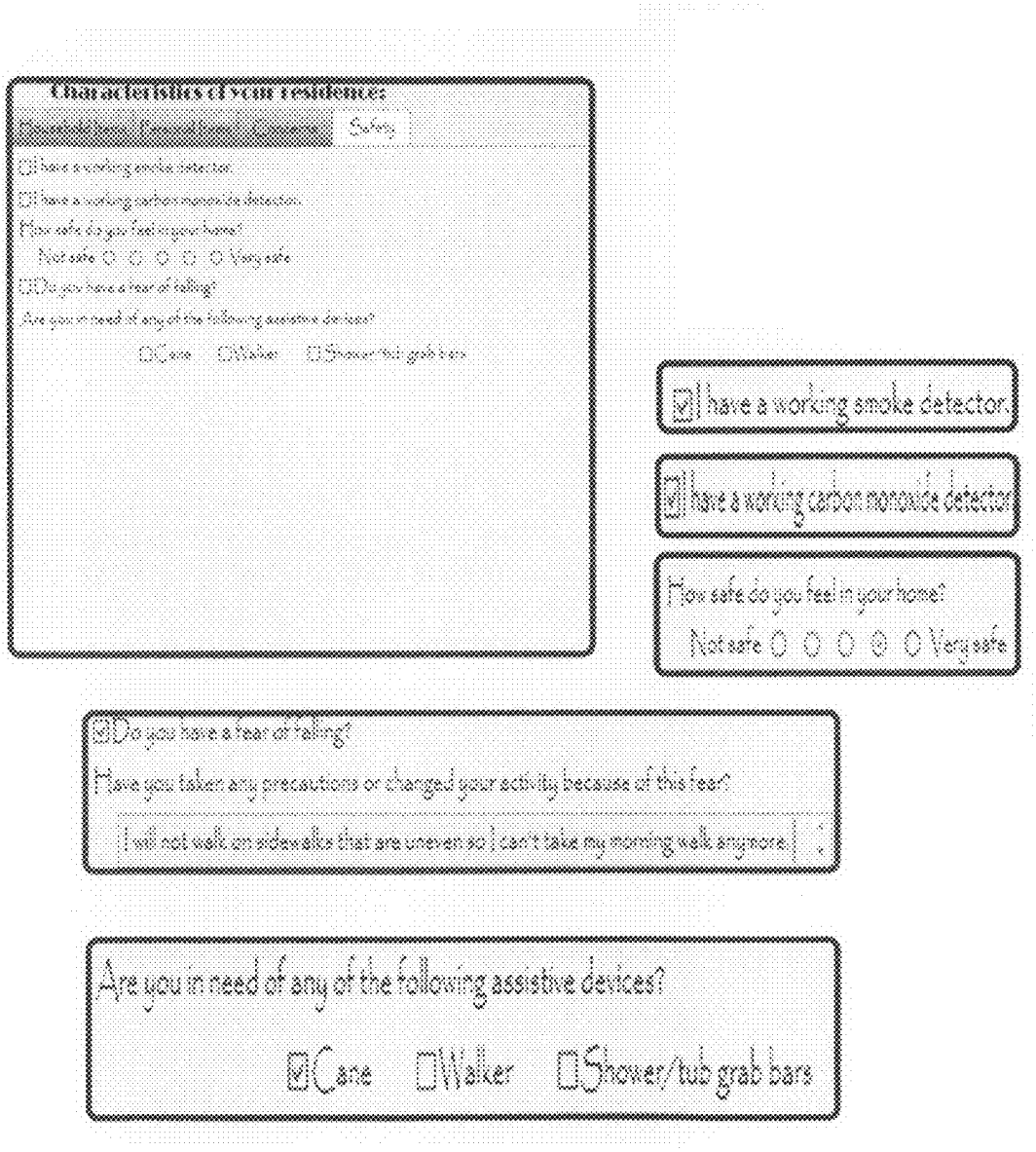

Characteristics of your residence:
Safety
☑ I have a working smoke detector.
☑ I have a working carbon monoxide detector.
How safe do you feel in your home?
Not safe ○ ○ ○ ◉ ○ Very safe
☑ Do you have a fear of falling?
Have you taken any precautions or changed your activity because of this fear?
I will not walk on sidewalks that are uneven so I can't take my morning walk anymore.
Are you in need of any of the following assistive devices?
☑ Cane ☐ Walker ☐ Shower/tub grab bars

Fig. 11

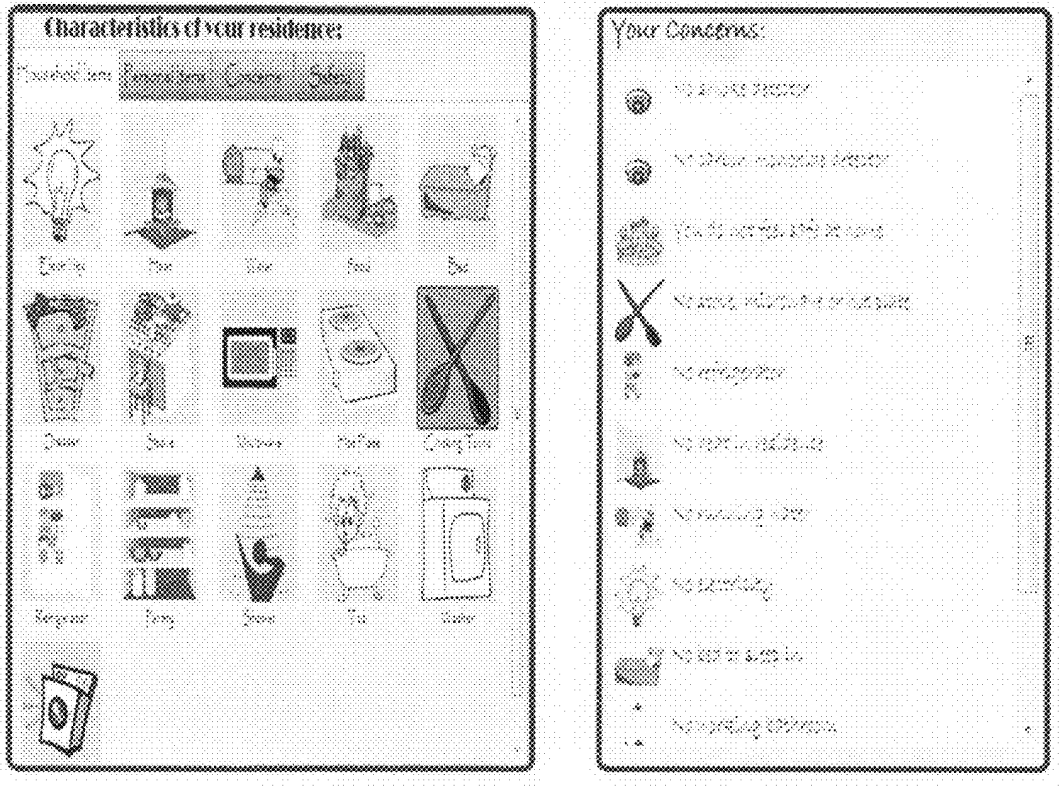


Fig. 12

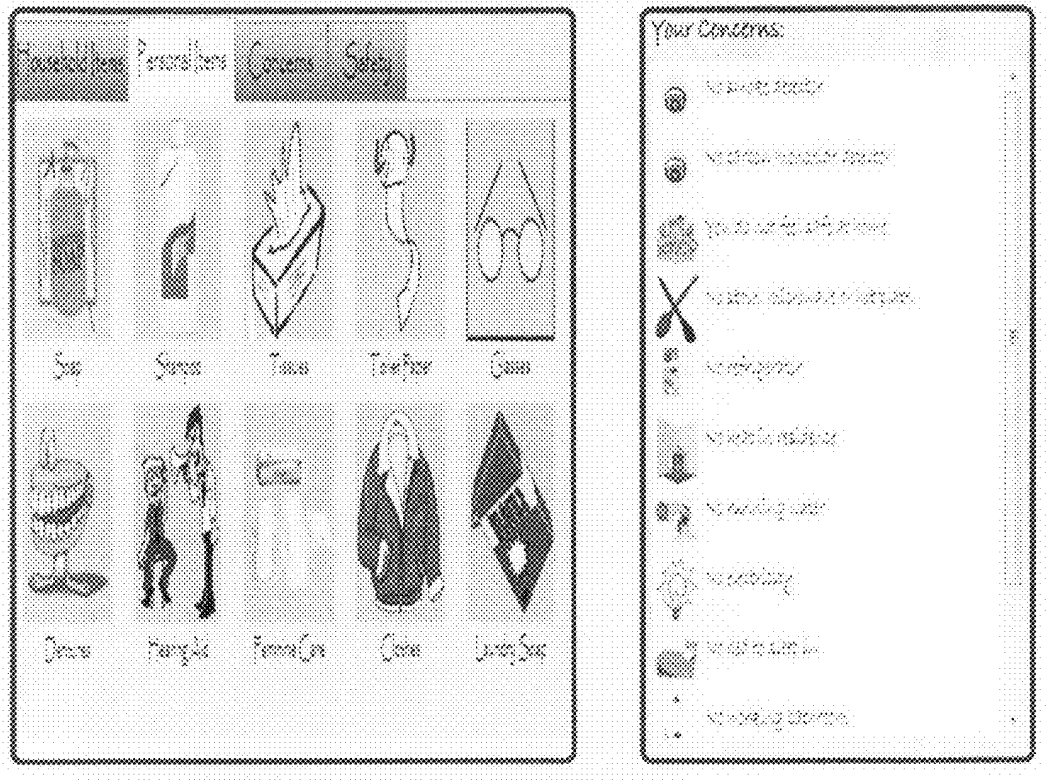


Fig. 13

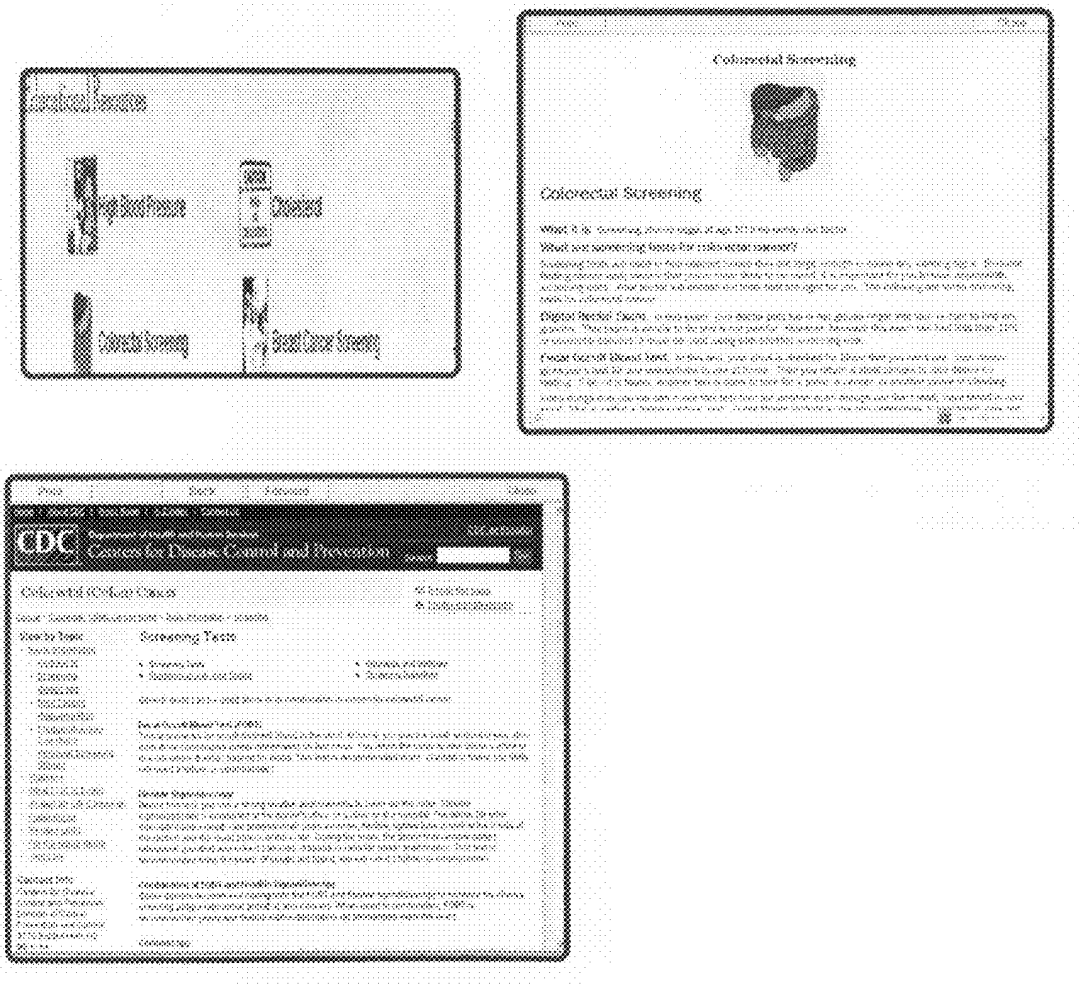
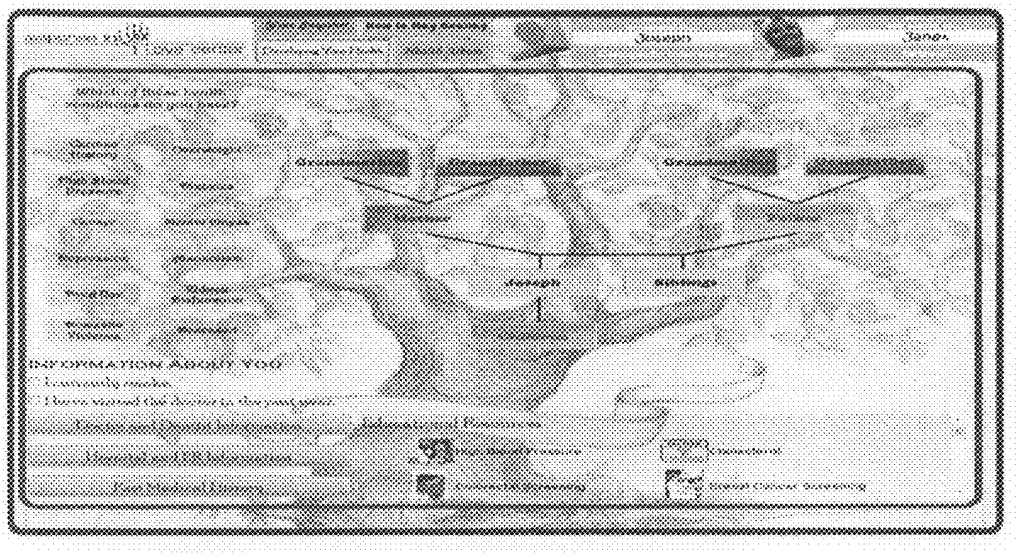


Fig. 14



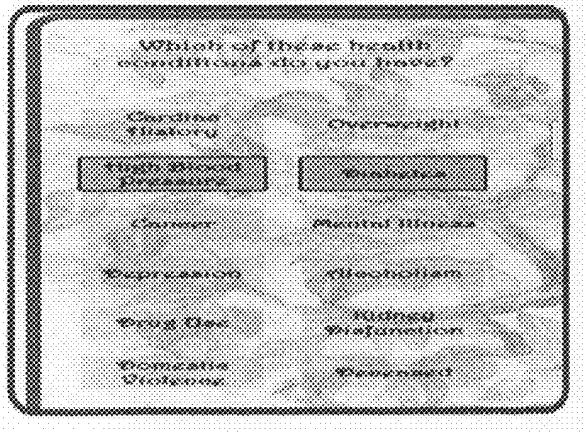


Fig. 15

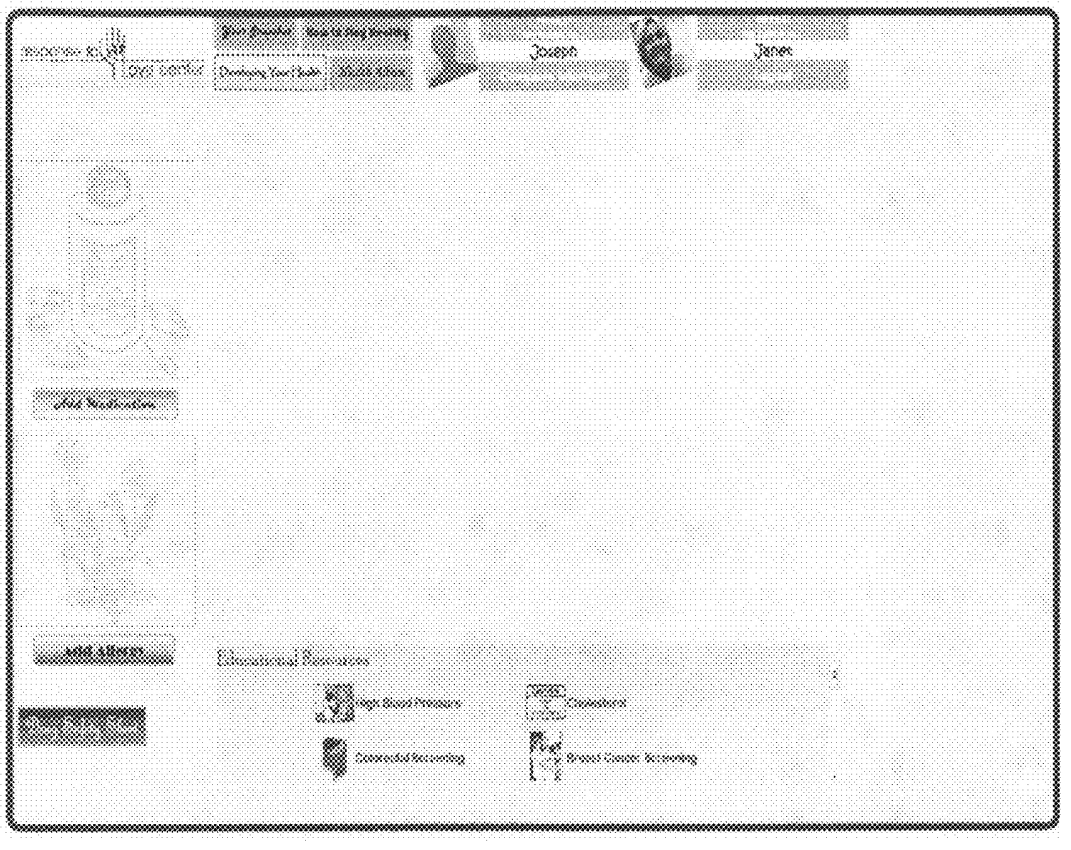


Fig. 16

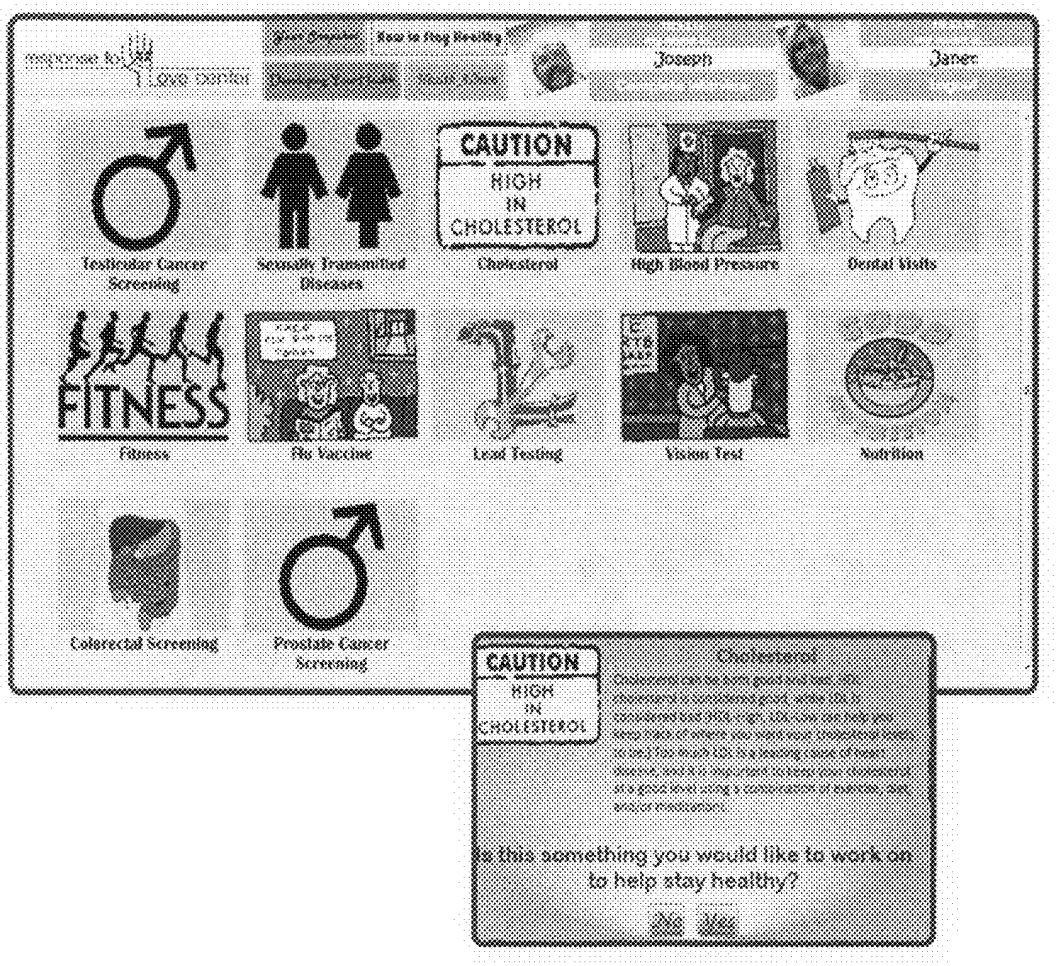

Joseph
Janet
CAUTION
HIGH
IN
CHOLESTEROL
Testicular Cancer Screening
Sexually Transmitted Diseases
Cholesterol
High Blood Pressure
Dental Visits
FITNESS
Fitness
Flu Vaccine
Lead Testing
Vision Test
Nutrition
Colorectal Screening
Prostate Cancer Screening
CAUTION
HIGH
IN
CHOLESTEROL
Is this something you would like to work on to help stay healthy?

Fig. 17

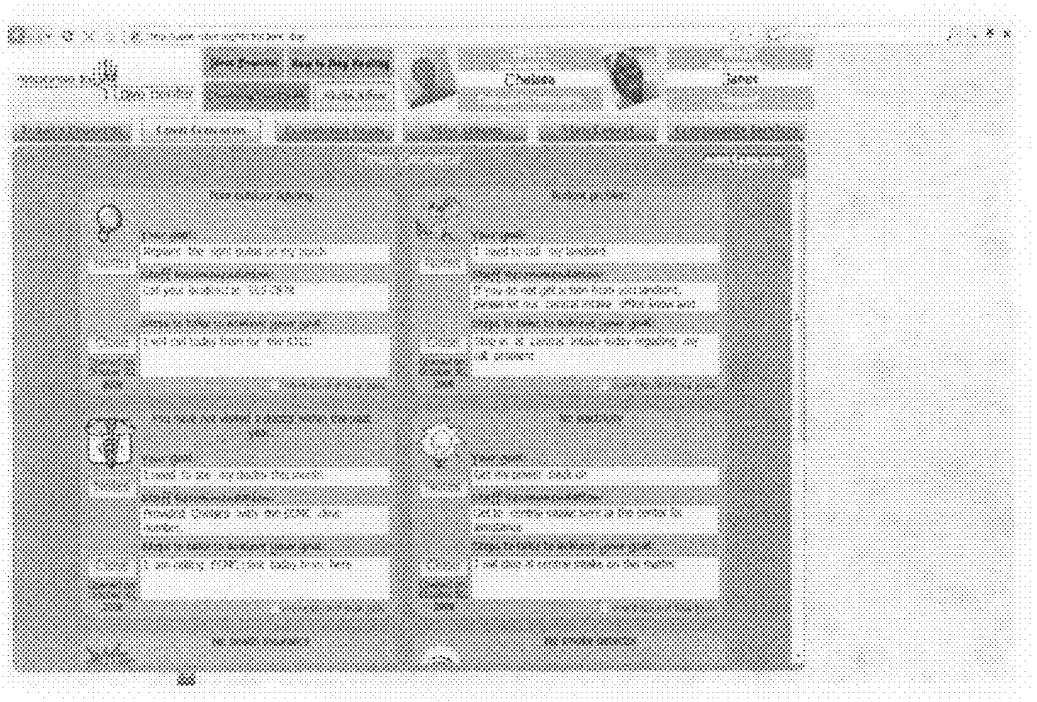


Fig. 18

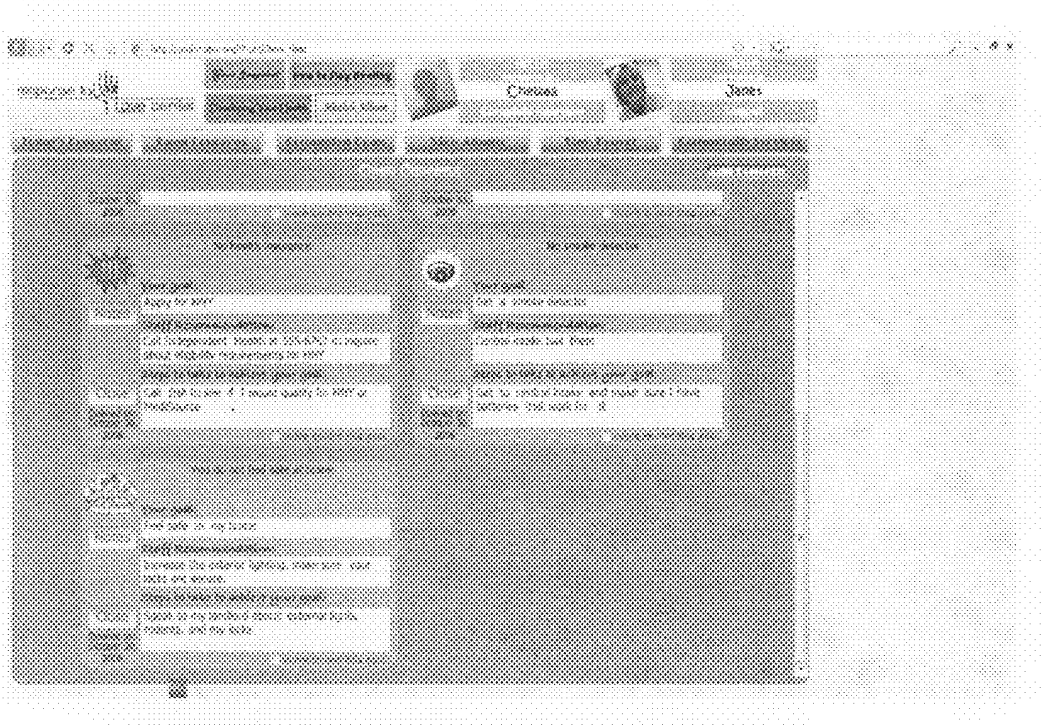


Fig. 19

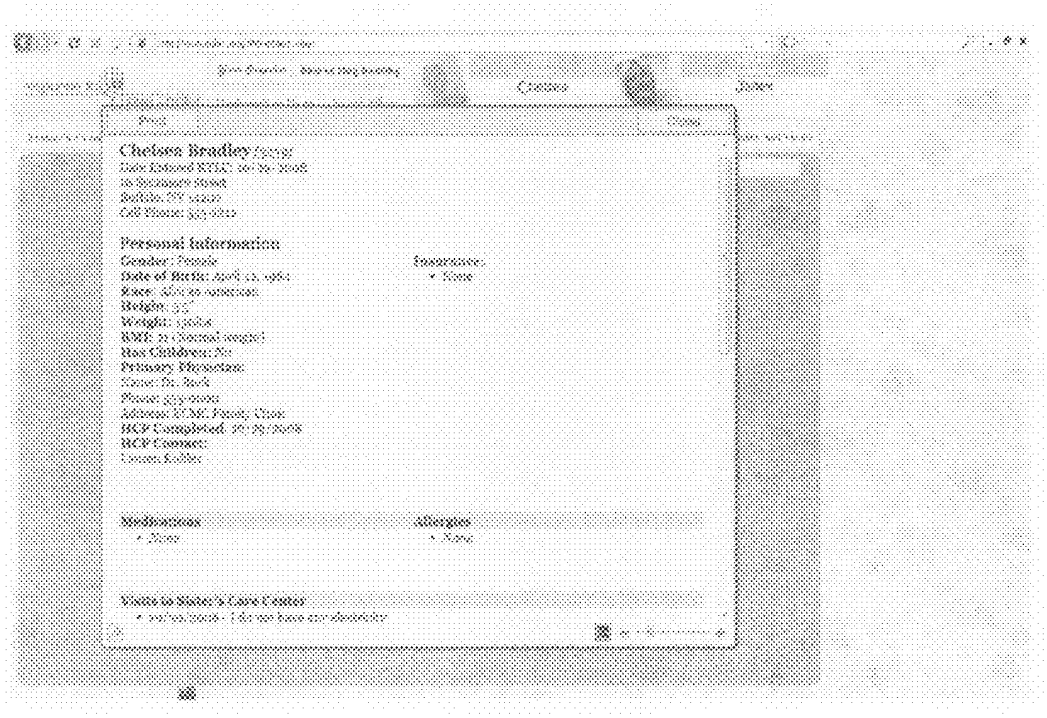


Fig. 20

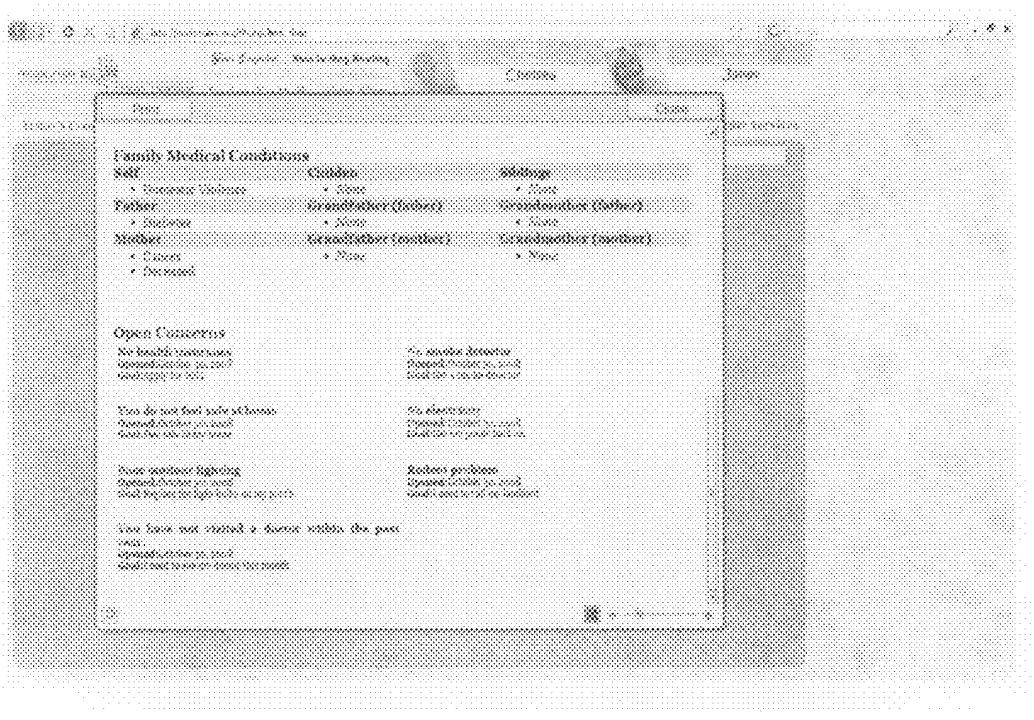


Fig. 21

ELECTRONIC HEALTH RECORD SYSTEM AND METHOD FOR AN UNDERSERVED POPULATION

REFERENCE TO COMPUTER PROGRAM LISTING APPENDIX

The present application includes a computer program listing appendix on compact disc. Two duplicate compact discs are provided herewith. Each compact disc contains an ASCII text file of the computer program listing as follows:

Size (bytes)	File Name	Last Updated
DIR	./	
1,899	YPOH.sln	Mar. 27, 2007
DIR	./Client	
3,352	app.config	May 27, 2007
563	App.xaml	Apr. 25, 2007
342	App.xaml.cs	Apr. 25, 2007
32,755	Client.csproj	May 3, 2007
330	CustomEnums.cs	Jul. 16, 2008
19,660	DataConverters.cs	Apr. 26, 2007
1,371	GenericConcern.cs	Jul. 16, 2008
735	Host.xaml	Jul. 16, 2008
2,603	Host.xaml.cs	Jul. 16, 2008
184	ICommitable.cs	Apr. 25, 2007
228	IConcern.cs	Jun. 1, 2007
19,042	Login.xaml	Jun. 12, 2007
9,993	Login.xaml.cs	Jun. 12, 2007
8,898	Main.xaml	May 3, 2007
11,315	Main.xaml.cs	May 3, 2007
9,213	Resources.xaml	Apr. 27, 2007
56,144	SessionData.cs	Apr. 27, 2007
574	Settings.cs	Jun. 18, 2007
798	USStates.cs	May 8, 2007
DIR	./Client/Content	
10,926	Developing.xaml	Jun. 12, 2007
2,699	Developing.xaml.cs	Jun. 12, 2007
15,230	DevelopingEnvironment.xaml	Jun. 12, 2007
16,123	DevelopingEnvironment.xaml.cs	Jun. 12, 2007
20,365	DevelopingFamily.xaml	Jun. 18, 2007
10,717	DevelopingFamily.xaml.cs	Jun. 18, 2007
9,986	DevelopingMedications.xaml	Jun. 12, 2007
8,968	DevelopingMedications.xaml.cs	Jun. 12, 2007
19,987	DevelopingMental.xaml	Jun. 1, 2007
21,037	DevelopingMental.xaml.cs	Jun. 1, 2007
12,953	DevelopingPhysical.xaml	Jun. 12, 2007
19,369	DevelopingPhysical.xaml.cs	Jun. 12, 2007
5,436	HealthAlbum.xaml	Apr. 25, 2007
26,201	HealthAlbum.xaml.cs	Apr. 25, 2007
9,526	HTSH.xaml	Jul. 16, 2008
4,154	HTSH.xaml.cs	Jul. 16, 2008
35,969	Snapshot.xaml	May 1, 2007
24,840	Snapshot.xaml.cs	May 1, 2007
DIR	./Client/Content/Album	
7,852	IndexCard.xaml	Jun. 12, 2007
8,181	IndexCard.xaml.cs	Jun. 12, 2007
DIR	./Client/Content/Mental	
24,539	Abuse.xaml	Jun. 1, 2007
6,831	Abuse.xaml.cs	Jun. 1, 2007
14,256	AlcoholScreening.xaml	Jun. 1, 2007
7,409	AlcoholScreening.xaml.cs	Jun. 1, 2007
6,618	CAGE.xaml	Jun. 1, 2007
3,008	CAGE.xaml.cs	Jun. 1, 2007
20,023	PHQ9.xaml	Jun. 1, 2007
6,265	PHQ9.xaml.cs	Jun. 1, 2007
DIR	./Client/Controls	
2,564	AccessKeyScoper.cs	Jun. 8, 2007
2,531	Education.xaml	May 11, 2007
1,494	Education.xaml.cs	May 11, 2007
2,606	WebBrowserControl.cs	Jun. 8, 2007
1,987	WebBrowserControl.designer.cs	Jun. 8, 2007
380	WebCam.xaml	Jun. 8, 2007
3,112	WebCam.xaml.cs	Jun. 8, 2007
DIR	./Client/Properties	

-continued

Size (bytes)	File Name	Last Updated
2,286	AssemblyInfo.cs	Apr. 25, 2007
3,923	Resources.Designer.cs	May 11, 2007
1,091	Settings.Designer.cs	Jun. 9, 2007
DIR	./Client/Service References/Service.ClientSearch	
666	Client.Service.ClientSearch.ClientSearchObject.datasource	Jun. 8, 2007
387	ClientSearch.disco	Jun. 8, 2007
3,363	ClientSearch.wsdl	Jun. 8, 2007
914	ClientSearch.xsd	Jun. 8, 2007
2,398	ClientSearch1.xsd	Jun. 8, 2007
1,028	ClientSearch2.xsd	Jun. 8, 2007
2,331	configuration.svcinfo	Jun. 8, 2007
5,767	Reference.cs	Jun. 8, 2007
2,451	Reference.svcmap	Jun. 8, 2007
DIR	./Client/Service References/Service.Education	
654	Client.Service.Education.EducationObject.datasource	Jun. 8, 2007
2,283	configuration.svcinfo	Jun. 8, 2007
381	Education.disco	Jun. 8, 2007
5,466	Education.wsdl	Jun. 8, 2007
1,231	Education.xsd	Jun. 8, 2007
1,953	Education1.xsd	Jun. 8, 2007
2,398	Education2.xsd	Jun. 8, 2007
8,404	Reference.cs	Jun. 8, 2007
2,418	Reference.svcmap	Jun. 8, 2007
DIR	./Client/Service References/Service.Main	
632	Client.Service.Main.BMIObject.datasource	Jun. 8, 2007
640	Client.Service.Main.ConcernObject.datasource	Jun. 8, 2007
652	Client.Service.Main.DevelopFamilyObject.datasource	Jun. 8, 2007
648	Client.Service.Main.EnvironmentObject.datasource	Jun. 8, 2007
654	Client.Service.Main.PhysicalHealthObject.datasource	Jun. 8, 2007
650	Client.Service.Main.PrescriptionObject.datasource	Jun. 8, 2007
650	Client.Service.Main.UserSnapshotObject.datasource	Jun. 8, 2007
2,206	configuration.svcinfo	Jun. 8, 2007
371	Main.disco	Jun. 8, 2007
31,727	Main.wsdl	Jun. 8, 2007
15,435	Main.xsd	Jun. 8, 2007
2,398	Main1.xsd	Jun. 8, 2007
31,130	Main2.xsd	Jun. 8, 2007
1,382	Main3.xsd	Jun. 8, 2007
181,732	Reference.cs	Jun. 8, 2007
2,544	Reference.svcmap	Jun. 8, 2007
DIR	./Client/Service References/Service.Photo	
2,219	configuration.svcinfo	Jun. 8, 2007
373	Photo.disco	Jun. 8, 2007
4,103	Photo.wsdl	Jun. 8, 2007
2,398	Photo.xsd	Jun. 8, 2007
1,017	Photo1.xsd	Jun. 8, 2007
1,383	Photo2.xsd	Jun. 8, 2007
2,666	Reference.cs	Jun. 8, 2007
2,374	Reference.svcmap	Jun. 8, 2007
DIR	./Client/Service References/Services.Prevention	
658	Client.Service.Prevention.PreventionObject.datasource	Jun. 8, 2007
2,299	configuration.svcinfo	Jun. 8, 2007
383	Prevention.disco	Jun. 8, 2007
5,534	Prevention.wsdl	Jun. 8, 2007
2,398	Prevention.xsd	Jun. 8, 2007
2,036	Prevention1.xsd	Jun. 8, 2007
2,265	Prevention2.xsd	Jun. 8, 2007
10,590	Reference.cs	Jun. 8, 2007
2,429	Reference.svcmap	Jun. 8, 2007
DIR	./Client/Service References/Service.StaffLogin	
658	Client.Service.StaffLogin.StaffLoginObject.datasource	Jun. 8, 2007
2,299	configuration.svcinfo	Jun. 8, 2007
6,192	Reference.cs	Jun. 8, 2007
2,429	Reference.svcmap	Jun. 8, 2007
383	StaffLogin.disco	Jun. 8, 2007
3,255	StaffLogin.wsdl	Jun. 8, 2007
970	StaffLogin.xsd	Jun. 8, 2007
2,398	StaffLogin1.xsd	Jun. 8, 2007

-continued

Size (bytes)	File Name	Last Updated
763	StaffLogin2.xsd	Jun. 8, 2007
DIR	./Server	
3,414	App.config	
113	ClientSearch.svc	Jun. 8, 2007
4,179	ClientSearch.svc.cs	Jun. 8, 2007
23,639	Concern.cs	Jun. 8, 2007
42,185	DevelopEnvironment.cs	Jun. 8, 2007
39,392	DevelopFamily.cs	Jun. 8, 2007
4,820	DevelopMain.cs	Jun. 8, 2007
43,998	DevelopMentalHealth.cs	Jun. 8, 2007
17,840	DevelopPhysicalHealth.cs	Jun. 8, 2007
33,499	DevelopPrescriptions.cs	Jun. 8, 2007
107	Education.svc	Jun. 8, 2007
11,786	Education.svc.cs	Jun. 8, 2007
356	IClientSearch.cs	Jun. 8, 2007
545	IEducation.cs	Jun. 8, 2007
395	IMain.cs	Jun. 8, 2007
411	IPhoto.cs	Jun. 8, 2007
564	IPrevention.cs	Jun. 8, 2007
355	IStaffLogin.cs	Jun. 8, 2007
1,341	Log.cs	Jul. 16, 2008
97	Main.svc	Jun. 8, 2007
12,520	Main.svc.cs	Jun. 8, 2007
99	Photo.svc	Jun. 8, 2007
2,585	Photo.svc.cs	Jun. 8, 2007
109	Prevention.svc	Jun. 8, 2007
18,532	Prevention.svc.cs	Jun. 8, 2007
1,158	Program.cs	Jun. 8, 2007
7,123	Server.csproj	Jun. 8, 2007
1,387	Settings.cs	Jun. 8, 2007
109	StaffLogin.svc	Jun. 8, 2007
3,168	StaffLogin.svc.cs	Jun. 8, 2007
58,339	UserSnapshot.cs	Jun. 8, 2007
3,161	Web.config	Jun. 8, 2007
2,182	YPOHServiceHost.cs	Jun. 8, 2007
DIR	./Server/Data	
12,907	Database.cs	Jun. 8, 2007
612	Format.cs	Jun. 8, 2007
888	ParamObject.cs	Jun. 8, 2007
DIR	./Server/Properties	
1,393	AssemblyInfo.cs	Jun. 8, 2007
DIR	./Old	
6,697	PictureOfHealth.mxml	Dec. 1, 2006
981	StringMatchingChecker.mxml	Dec. 1, 2006
DIR	./Old/myComponent	
2,481	AddMemberPopup.mxml	Nov. 17, 2006
2,016	AddNewClient.mxml	Nov. 17, 2006
11,075	BasicInfo.mxml	Oct. 10, 2006
15,501	Copy of Sidebar.mxml	Nov. 17, 2006
860	CreateNew.mxml	Oct. 10, 2006
32,506	DevelopingScreen.mxml	Dec. 1, 2006
19,417	DevelopingSubScreen.mxml	Nov. 28, 2006
1,763	LoginBox.mxml	Dec. 1, 2006
2,444	PantryVoucher.mxml	Oct. 10, 2006
18,883	Sidebar.mxml	Nov. 28, 2006
7,468	SnapshotScreen.mxml	Dec. 1, 2006
DIR	./Old/PHPScript	
1,122	addClient.php	Nov. 28, 2006
814	addDevelopingInfo.php	Nov. 28, 2006
0	getClientInfo.php	Nov. 28, 2006
787	getClients.php	Nov. 28, 2006
879	getClientSnapshotInfo.php	Nov. 28, 2006
854	login.php	Nov. 28, 2006
1,039	photoUpload.php	Nov. 28, 2006
904	updateClientDevelopingInfo.php	Nov. 28, 2006
883	updateClientSnapshotInfo.php	Nov. 28, 2006
1,075	writeuser.php	Nov. 28, 2006
DIR	./Old/PoHScripts	
5,742	Handlers.as	Dec. 1, 2006
5,712	SnapshotHandlers.as	Dec. 1, 2006
1,056	StringHelper.as	Nov. 17, 2006
2,281	StringMatcher.as	Dec. 1, 2006

The computer program listing appendix is hereby expressly incorporated by reference in the present application.

FIELD OF THE INVENTION

The invention relates generally to a system and method for generating, managing, and monitoring electronic health records, in particular, for an underserved population. More specifically, the present invention addresses personal and environmental factors affecting health and uses an easy to understand graphical format for presenting and gathering information.

BACKGROUND OF THE INVENTION

Systems for eliciting information from patients regarding physical symptoms are known. It would be desirable to expand the scope and nature of information obtained from patients regarding factors affecting health of the patients.

SUMMARY OF THE INVENTION

The invention broadly comprises a system for managing electronic health records, including: an interface element in at least one specially programmed general-purpose computer for receiving first data regarding at least one environmental condition related to a patient, second data regarding at least one symptom of the patient related to physical or mental health of the patient, and background data for the patient; a memory element for the at least one specially programmed general-purpose computer for storing the first, second, and background data; and a processor in the at least one specially programmed general-purpose computer for: generating, using the first, second, and background data, information regarding at least one concern applicable to the physical or mental health of the patient; and generating, using the first, second, and background data, at least one action item for addressing the at least one concern. The interface element is for transmitting at least a portion of the information regarding the at least one concern for the physical or mental health of the patient and the at least one action item for display and receiving third data regarding compliance with the at least one action item.

In one embodiment, the at least one action item includes an action item directed to an environmental condition from the at least one environmental condition; the processor is for generating a graphical presentation including at least one inquiry, in the form of a pictorial display, regarding compliance of the patient with the action item directed to an environmental condition; and the interface element is for transmitting the graphical presentation for display on a graphical user interface (GUI) and receiving data regarding compliance of the patient with the action item directed to an environmental condition via a GUI on which the graphical presentation is displayed.

In another embodiment, the processor is for generating a graphical presentation including a plurality of inquiries, in the form of respective pictorial displays, regarding a plurality of respective environmental conditions; and the interface element is for transmitting the graphical presentation for display on a GUI and receiving at least a portion of the first data via a GUI on which the graphical presentation is displayed. In a further embodiment, the at least one environmental condition is selected from the group consisting of whether the patient is homeless, the type of residence in which the patient lives, conditions in the vicinity of the patient's residence, utilities for and infrastructure of the patient's residence, household items associated with the patient's residence, personal items belonging to the patient, transportation options available to the patient, and personal safety issues.

In one embodiment, the at least one action item addresses an environmental condition from the at least one environmental condition. In another embodiment, the processor is for generating an inquiry as to whether the patient wishes further information regarding the at least one health concern; the interface element is for transmitting the inquiry for display and receiving an affirmative response to the inquiry, including a request for further information regarding a health concern from the at least one health concern; the processor is for generating information regarding the health concern, the information regarding the health concern more detailed than the information regarding the at least one concern for the physical or mental health of the patient; and the interface element is for transmitting the information regarding the health concern.

The invention further broadly comprises a method for managing electronic health care records.

It is a general object of the present invention to provide a system and a method for generating, managing, and monitoring electronic health records, in particular, for an underserved population. More specifically, the present invention is intended to addresses personal and environmental factors affecting health and uses an easy to understand graphical format for presenting and gathering information.

These and other objects and advantages of the present invention will be readily appreciable from the following description of preferred embodiments of the invention and from the accompanying drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and mode of operation of the present invention will now be more fully described in the following detailed description of the invention taken with the accompanying drawing figures, in which:

FIG. **1** is a schematic block diagram of a present invention system for managing electronic health records;

FIG. **2** is a flow chart of a present invention method for managing electronic health records; and,

FIGS. **3-21** include screen captures illustrating a present invention system and method.

DETAILED DESCRIPTION OF THE INVENTION

At the outset, it should be appreciated that like drawing numbers on different drawing views identify identical, or functionally similar, structural elements of the invention. While the present invention is described with respect to what is presently considered to be the preferred aspects, it is to be understood that the invention as claimed is not limited to the disclosed aspects.

Furthermore, it is understood that this invention is not limited to the particular methodology, materials and modifications described and as such may, of course, vary. It is also understood that the terminology used herein is for the purpose of describing particular aspects only, and is not intended to limit the scope of the present invention, which is limited only by the appended claims.

Unless defined otherwise, all technical and scientific terms used herein shall include the same meaning as commonly understood to one of ordinary skill in the art to which this invention belongs. Although any methods, devices or materials similar or equivalent to those described herein can be used in the practice or testing of the invention, the preferred methods, devices, and materials are now described.

It should be understood that the use of "or" in the present application is with respect to a "non-exclusive" arrangement, unless stated otherwise. For example, when saying that "item x is A or B," it is understood that this can mean one of the following: 1) item x is only one or the other of A and B; and 2) item x is both A and B. Alternately stated, the word "or" is not used to define an "exclusive or" arrangement. For example, an "exclusive or" arrangement for the statement "item x is A or B" would require that x can be only one of A and B.

FIG. **1** is a block diagram for present invention system **100** for managing electronic health records. System **100** includes: processor **102**, interface element **104**, and memory element, or unit, **106** of at least one specially programmed general-purpose computer **108**. The interface element is for receiving data **110** regarding at least one environmental condition **112** related to a patient (not shown), data **114** regarding at least one symptom of the patient related to physical or mental health of the patient, and background data **116** for the patient. The memory element stores data **110**, **114**, and **116**.

The processor is for generating, using data **110**, **114**, and **116**, information **118** regarding at least one concern **120** applicable to the physical or mental health of the patient. For example, using data **110**, **114**, and **116**, the processor identifies concern **120** and then generates information **118**, which is descriptive of the health concern. It should be understood that the concern may be directly related to the patient, for example, a physical or mental symptom or condition, or can be directed to a situation or condition in which the patient finds them self or that otherwise impacts the patient's well-being, as further described infra. The processor also generates, using data **110**, **114**, and **116**, at least one action item **122** for addressing the at least one concern. The interface element is for transmitting at least a portion of information **118** and action item **122** for display, for example, on graphical user interface (GUI) **124**, and receiving data **126** regarding compliance with the at least one action item, for example, from GUI **124**. Data **126** is stored in the memory element. The patient can directly input data **126** in the system in response to pictorial or graphic displays on the GUI or a health care provider can obtain the information from the patient and input the information.

By interface element, we mean any combination of hardware, firmware, or software in a computer used to enable communication or data transfer between the computer and a device, system, or network external to the computer. The interface element can connect with the device, system, or network external to the computer, for example, GUI **124**, using any means known in the art, including, but not limited to a hardwire connection, an optical connection, an Internet connection, or a radio frequency connection. Processor **102**, interface element **104**, and memory element **106** can be any processor, interface element, or memory element, respectively, or combination thereof, known in the art.

Computer **108** can be any computer or plurality of computers known in the art. In one embodiment, the computer is located in a health care location with which system **100** is associated, for example, location **130**. In another embodiment (not shown), all or parts of the computer are remote from retail locations with which system **100** is associated. In a further embodiment, computer **108** is associated with a plurality of health care locations with which system **100** is associated. Thus, the computer provides the functionality described supra and infra for more than one health care location.

In one embodiment, the at least one action item includes action item **132** directed to environmental condition **134** from the at least one environmental condition; the processor is for generating graphical presentation **136** including at least one

inquiry **138**, including a pictorial display, regarding compliance of the patient with action item **132**; and, the interface element is for transmitting the graphical presentation for display on a GUI, for example, GUI **124**, and receiving data **142** regarding compliance of the patient with action item **132**, for example, as displayed via a GUI **124**. Data **142** is stored in the memory element.

In another embodiment, the processor is for generating graphical presentation **144** including a plurality of inquiries **146**, including respective pictorial displays, regarding a plurality of respective environmental conditions **150**; and the interface element is for transmitting graphical presentation **144** for display on a GUI, for example, GUI **124**, and receiving at least a portion of data **110** via a GUI on which the graphical presentation is displayed, for example, GUI **124**. That is, condition **112** is selected from conditions **150**.

In one embodiment, environmental conditions **150** include, but are not limited to whether the patient is homeless, the type of residence in which the patient lives, conditions in the vicinity of the patient's residence, utilities for and infrastructure of the patient's residence, household items associated with the patient's residence, personal items belonging to the patient, transportation options available to the patient, and personal safety issues.

In another embodiment, the processor is for generating inquiry **152** as to whether the patient wishes further information regarding the at least one health concern and the interface element is for transmitting the inquiry for display, for example, on GUI **124**, and receiving affirmative response **154**, for example, via GUI **124**, to the inquiry. The affirmative response includes request **156** for further information regarding health concern **158** from health concerns **120**. Response **154** is stored in the memory element. The processor generates information **160** regarding health concern **158**, information **160** more detailed than information **118**. The interface element transmits information **160**, for display, for example, on GUI **124**.

It should be understood that various storage and removal operations, not explicitly described above, involving memory **106** and as known in the art, are possible with respect to the operation of system **100**. For example, outputs from and inputs to the general-purpose computer can be stored and retrieved from the memory elements and data generated by the processor can be stored in and retrieved from the memory.

FIG. **2** is a flow chart illustrating a present invention computer-based method for managing electronic health records. Although the method in FIG. **2** is depicted as a sequence of numbered steps for clarity, no order should be inferred from the numbering unless explicitly stated. The method starts at Step **200**. Step **202** receives, using an interface element in at least one specially programmed general-purpose computer, first data regarding at least one environmental condition related to a patient, second data regarding at least one symptom of the patient related to physical or mental health of the patient, and background data for the patient; step **204** stores the first, second, and background data in a memory element for the at least one specially programmed general-purpose computer; step **206** generates, using a processor in the at least one specially programmed general-purpose computer and the first, second, and background data, information applicable to at least one concern with respect to the physical or mental health of the patient; step **208** generates, using the processor and the first, second, and background data, at least one action item for addressing the at least one concern; step **210** transmits, using the interface element, at least a portion of the information regarding at least one concern for the physical or mental health of the patient and the at least one action item for display; and step **212** receives, using the interface element, third data regarding compliance with the at least one action item.

In one embodiment, the at least one action item includes an action item directed to an environmental condition from the at least one environmental condition, step **214**, generates, using the processor, a graphical presentation including at least one inquiry, including a pictorial display, regarding compliance of the patient with the action item directed to an environmental condition; and step **216** transmits, using the interface element, the graphical presentation for display on a graphical user interface (GUI). Receiving the third data includes receiving data regarding compliance of the patient with the action item directed to an environmental condition via a GUI on which the graphical presentation is displayed.

In another embodiment, step **218** generates, using the processor, a graphical presentation including a plurality of inquiries, with respective pictorial displays, regarding a plurality of respective environmental conditions; and step **220** transmits, using the interface element, the graphical presentation for display on a GUI. Then, receiving the first data includes receiving at least a portion of the first data via a GUI on which the graphical presentation is displayed.

In a further embodiment, the at least one environmental condition includes whether the patient is homeless, the type of residence in which the patient lives, conditions in the vicinity of the patient's residence, utilities for and infrastructure of the patient's residence, household items associated with the patient's residence, personal items belonging to the patient, transportation options available to the patient, and personal safety issues.

In one embodiment, the at least one action item addresses an environmental condition from the at least one environmental condition. In another embodiment, step **222** generates, using the processor, an inquiry as to whether the patient wishes further information regarding the at least one health concern; step **224** transmits, using the interface element, the inquiry for display; step **226** receives, using the interface element, an affirmative response to the inquiry, including a request for further information regarding a health concern from the at least one health concern; step **228** generates, using the processor, information regarding the health concern, the information regarding the health concern more detailed than the information regarding at least one concern for the physical or mental health of the patient; and step **230** transmits, using the interface element, the information regarding the health concern.

FIG. **3** includes one or more screen captures from a present invention system, hereinafter referred to as "the system," illustrating a procedure for entering a new patient in the system. This screen enables a user of the system, hereafter referred to as the "health coach," to start the process of entering a new client into the system and to show the client the Privacy Notice. In this scenario, Joseph, a new client, visits for the first time a clinic using the system. Janet, the health coach in this illustration, is able to review the Privacy Notice with Joseph. Janet's name and picture will appear on every page to reaffirm that she is legitimate. This allows Joseph to feel like he is in a secured environment. In subsequent screens (not shown) accessible from the screen in FIG. **3**, information, such as background data **116** is gathered for Joseph. In the descriptions that follow, Janet and Joseph are used as examples of a patient and health coach/health care provider, respectively.

FIG. **4** includes one or more screen captures from the system illustrating a procedure for gathering and entering further data regarding a new patient. For example, Joseph has

come to the clinic for the first time and Janet is obtaining and entering information, such as background data **116** for Joseph. A photograph of Joseph appears on the screen. In subsequent screens (not shown) accessible from the screen in FIG. **4**, information, such as demographics, insurance coverage, health care proxy, emergency contacts, and pets is gathered for Joseph.

FIG. **5** includes one or more screen captures from the system illustrating a procedure for gathering and entering data, for example, data **110**, regarding living conditions, or environmental conditions, for example, conditions **112**, for a new patient. For example, the data is regarding the types of transportation to which Joseph has access. Thus, this screen enables the coach to gather data regarding aspects of the patient's living arrangement that present a concern for the patient and may impact the physical, mental, or emotional health of the patient.

FIG. **6** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding the purpose of a patient's visit. Pictorially represented options and aspects, in the form of icons, include 'Living Conditions,' 'State of Mind, 'Physical Health,' 'Family History,' and Medications.' In the scenario shown, Joseph has clicked on 'State of Mind' icon and told Janet that he is feeling sad lately.

FIG. **7** includes one or more screen captures from the system illustrating a procedure for gathering and entering further data with respect to the 'State of Mind' option in FIG. **6**. Using this screen, the health coach is able to gather further information regarding the patient's mental and emotional health. The screen has pictorial representations of various mood/emotions that the patient can select. For example, Joseph selects the icon for 'Anxiety.' In response to the selection of this icon an appropriate icon for gauging the intensity of the mood is displayed to the right. For example, in FIG. **7**, faces illustrating levels of anxiety from 'calm' to 'scared' and a bar for choosing a level of intensity are displayed. Joseph has selected a level in the approximate mid-range of the bar.

FIG. **8** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's physical health and for generating and displaying applicable information. Janet returns to the screen in FIG. **6** and asks Joseph to click on the respective icon for another issue with which Joseph is concerned. Joseph selects the icon for 'Physical Health' to cause the screen in FIG. **8** to display. Thus, this interactive screen enables the client to select one or more physical complaints or concerns that they would like to discuss further with their health coach. The system gathers and enters this data, for example, as data **114**. When the mouse cursor is placed over pictorial representation **302** of the human body, areas specific to a region on the human body, for example, arm area **304** or leg area **306** are shaded. Once a region has been selected by the patient or the coach, a series of icons corresponding to the selected body part are displayed in field **308**, for example, for further discussion and documentation. In this case, Joe complains that his hand is hurting him and Janet selected area **304**, an area that closely resembles the area of Joe' concern. In addition, Joe or Janet type in field **310** information regarding the concern, for example: "My hand has been going numb when I write and sometimes it just aches."

FIG. **9** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's living conditions. Janet returns to the screen in FIG. **7** and asks Joseph to click on the respective icon for another issue with which Joseph is concerned. Joseph selects the icon for 'Living Conditions' to cause the screen in FIG. **9** to display. This screen enables the coach to gather information, for example, information **110**, regarding the patient's environment, or living, conditions, for example, conditions **112**. Field **312** pictorially represents possible types of housing that Joseph can view and select. If Joseph is homeless, this information is gathered and entered at this point. Tabs **314** are for general categories of characteristics for a residence. Field **316** is populated with icons according to the tab **314** selected. The tab for 'Household Items' is selected in FIG. **9** to generate the icons shown in field **316** in FIG. **9**.

FIG. **10** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's living conditions. To generate the screen shown in FIG. **10**, the tab for 'Concerns' in FIG. **9** is selected. Field **316** is populated with a series of questions and a section for entering information regarding needed repairs or other miscellaneous items. For example, concerns not listed in field **316** can be entered in this section. The respective boxes are checked for questions in field **316** that represent concerns for the patient. For example, the patient selected boxes for outside lighting, lead poisoning, and rodents and a notation regarding a water leak is made. The items associated with the checked boxes, and the notation regarding the leak, are added to a concerns list, in field **318** in FIG. **9**. Thus, this screen enables the coach to gather data regarding aspects of the patient's living arrangement that present a concern for the patient and may impact the physical, mental, or emotional health of the patient. The tab for 'Safety' is selected from tabs **314** to generate the screen in the next figure.

FIG. **11** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's living conditions. Field **316** is populated with a series of questions regarding potential safety issues. The respective boxes are checked for questions in field **316** that represent safety concerns for the patient. For example, boxes for a smoke detector and carbon monoxide detector are checked and a perceived safety level is selected. The items associated with the checked boxes and the perceived safety level are added to the concerns list in field **318**. Thus, this screen enables the coach to gather data regarding safety concerns for the patient that may impact the physical, mental, or emotional health of the patient. The tab for 'Household Items' is selected from tabs **314** to generate the screen in the next figure.

FIG. **12** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's living conditions. Field **316** is populated with a series of icons regarding household items. Respective icons are selected that represent household items that the patient does not have (that are a concern). For example, boxes for cooking tools, heat, electricity, and a refrigerator are checked. The items associated with the selected icons are added to the concerns list in field **318**. Thus, this screen enables the coach to gather data regarding household items that are lacking for the patient, present a concern for the patient and may impact the physical, mental, or emotional health of the patient. The tab for 'Personal Items' is selected from tabs **314** to generate the screen in the next figure.

FIG. **13** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's living conditions. Field **316** is populated with a series of icons regarding personal items. Respective icons are selected that represent personal items that the patient does not have (that are a concern). The items associated with the selected icons are added to the concerns list in field **318**. Thus, this screen enables the coach to gather data

regarding personal items that are lacking for the patient, present a concern for the patient and may impact the physical, mental, or emotional health of the patient. The icon for 'Colorectal Screening' is selected from the icons for 'Education Resources' in FIG. **9** to generate the screen in the next figure.

In one embodiment, in all or some of FIGS. **9-13**: some or all of the screens shown are presentation **144**, some or all of the inquiries are inquiries **146**, and all or some of the conditions displayed are conditions **150**.

FIG. **14** includes one or more screen captures from the system illustrating a procedure for addressing concerns a patient may have. Information regarding colorectal screening is displayed in fields **316**. For example, basic information regarding the screening and a website with more detailed information are presented.

FIG. **15** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's family history. Janet returns to the screen in FIG. **6** and selects the icon for 'Family History' to cause the screen in FIG. **15** to display. FIG. **15** is a pictorial representation of a possible family tree. This screen enables the coach to gather information regarding the patient's overall health conditions including access to health care and family medical history. For example, Joseph tells Janet that he has high blood pressure and diabetes and Janet selects corresponding icons accordingly. Icons also are displayed for obtaining the following for the patient: doctor and dentist information, hospital and emergency room information, and past medical history. When an icon for a member of the family tree is selected, for example, 'Mother,' icons related to possible health conditions, such as 'High Blood Pressure,' displayed to the left of the screen, can be selected to record health conditions associated with the selected member of the family tree. Note that the 'Educational Resources' icons, shown in FIG. **9** and described in FIG. **14**, also appear in this figure. In general, these icons are presented where appropriate through the system displays.

FIG. **16** includes one or more screen captures from the system illustrating a procedure for gathering and entering data regarding a patient's medications. Janet returns to the screen in FIG. **6** and selects the icon for 'Medications' to cause the screen in FIG. **16** to display. This screen enables the coach to gather information regarding the patient's medications and allergies. An icon for displaying drug safety information also is displayed. The 'Educational Resources' icons, shown in FIG. **9** also appear in this figure.

FIG. **17** includes one or more screen captures from the system illustrating a procedure for assessing a patient's understanding of preventative care. Janet returns to the screen in FIG. **6** and selects the tab for 'How to Stay Healthy' to cause the screen in FIG. **17** to display. As Joseph views the screen in FIG. **17**, Janet asks Joseph which subjects he is concerned with or wishes to receive more information about. For example, Joseph expresses an interest in cholesterol and Janet selects the cholesterol icon to display further information regarding the subject.

FIGS. **18** and **19** are screen captures from the system illustrating a procedure for summarizing a patient's visit. FIG. **18** shows the top portion of a display and FIG. **19** shows the screen in FIG. **18** scrolled down to show the rest of the display. Note that the name of the patient has changed in FIG. **18**. Janet and the patient, Chelsea, have gone through a process as described supra to gather data and identify concerns related to Chelsea. For example, from the screen shown in FIG. **6**, Janet selects the icon for 'Health Album' to cause the screen in FIG. **18** to display. The screen displays the concerns identified with respect to the patient, recommendations for addressing the concerns, and steps to implement the recommendations. In FIG. **18**, concerns associated with the patient's physical health (have not visited a doctor within the past year) and environmental, or living, conditions are shown. Thus, in addition to addressing the physical health or symptoms of the patient, environment or living conditions that could affect the physical, mental, or emotional health and well being of the patient are advantageously included. For example, the patient has identified problems with a porch light, smoke detector, and electrical service. In one embodiment, the recommendations and steps for implementation are inputted by the user of system **100**, for example, the health care provider. In one embodiment, system **100** automatically generates and displays recommendations and steps. In one embodiment, the recommendations or steps are produced by a combination of user input and automatic generation.

FIGS. **20** and **21** are screen captures from the system illustrating a procedure for summarizing a patient's visit. FIG. **20** shows the top portion of a display and FIG. **21** shows the screen in FIG. **20** scrolled down to show the rest of the display. Janet has selected the print option to display a printable summary of the information shown in FIGS. **18** and **19**. This summary shows that a full range of factors regarding the physical, mental, or emotional health and well being of the patient have been identified and addressed. For example, the patient's family history is shown as well as the open concerns shown in FIGS. **18** and **19**.

Thus, it is seen that the objects of the invention are efficiently obtained, although changes and modifications to the invention should be readily apparent to those having ordinary skill in the art, without departing from the spirit or scope of the invention as claimed. Although the invention is described by reference to a specific preferred embodiment, it is clear that variations can be made without departing from the scope or spirit of the invention as claimed.

What is claimed is:

1. A method for managing electronic health records, comprising:

receiving, using an interface element in at least one specially programmed general-purpose computer, first data regarding at least one environmental condition related to a patient, second data regarding at least one symptom of the patient related to physical or mental health of the patient, and background data for the patient;

storing the first, second, and background data in a memory element for the at least one specially programmed general-purpose computer;

generating, using a processor in the at least one specially programmed general-purpose computer and the first, second, and background data, information regarding at least one concern applicable to the physical or mental health of the patient;

generating, using the processor and the first, second, and background data, at least one action item for addressing the at least one concern;

storing, in the memory element, the at least one action item;

transmitting, using the interface element, at least a portion of the information regarding the at least one concern for the physical or mental health of the patient for display and the at least one action item for display;

receiving, using the interface element, third data regarding compliance with the at least one action item, the third data including information as to whether the at least one action item has been complied with; and,

when the at least one action item has not been complied with, transmitting, using the interface element, the at least one action item for display; or,

when the at least one action item has been complied with, modifying the stored at least one action item to indicate that the at least one action has been complied with; and,

transmitting for display, using the interface element, a message that the at least one action item has been complied with, wherein the at least one environmental condition is selected from the group consisting of conditions in the vicinity of the patient's residence, utilities for and infrastructure of the patient's residence, household items associated with the patient's residence, personal items belonging to the patient, transportation options available to the patient, and the patient's perceived level of safety in their residence.

2. The method of claim **1** wherein the at least one action item includes an action item directed to an environmental condition from the at least one environmental condition, the method further comprising:

generating, using the processor, a graphical presentation including at least one inquiry, in the form of a pictorial display, regarding compliance of the patient with the action item directed to an environmental condition; and,

transmitting, using the interface element, the graphical presentation for display on a graphical user interface (GUI), wherein receiving the third data includes receiving data regarding compliance of the patient with the action item directed to an environmental condition via a GUI on which the graphical presentation is displayed.

3. The method of claim **1** further comprising:

generating, using the processor, a graphical presentation including a plurality of inquiries, in the form of respective pictorial displays, regarding a plurality of respective environmental conditions; and,

transmitting, using the interface element, the graphical presentation for display on a GUI, wherein receiving the first data includes receiving at least a portion of the first data via a GUI on which the graphical presentation is displayed.

4. The method of claim **1** wherein the at least one action item addresses an environmental condition from the at least one environmental condition.

5. The method of claim **1** further comprising:

generating, using the processor, an inquiry as to whether the patient wishes further information regarding the at least one health concern;

transmitting, using the interface element, the inquiry for display;

receiving, using the interface element, an affirmative response to the inquiry, including a request for further information regarding a health concern from the at least one health concern;

generating, using the processor, information regarding the health concern, the information regarding the health concern more detailed than the information regarding the at least one concern for the physical or mental health of the patient; and,

transmitting, using the interface element, the information regarding the health concern.

6. The method of claim **1** wherein the at least one action items includes a plurality of action items, the method further comprising when a first action item from the plurality of action items has not been complied with and when a second action item from the plurality of action items has been complied with:

transmitting, using the interface element, the first action item for display;

modifying the stored second action item to indicate that the second action has been complied with; and,

transmitting for display, using the interface element, a message that the second action item has been complied with.

7. A system for managing electronic health records, comprising:

a processor in at least one specially programmed general-purpose computer for generating a graphical presentation including at least one inquiry, in the form of a pictorial display, regarding at least one environmental conditions related to a patient;

an interface element in the at least one specially programmed general-purpose computer for:

transmitting the graphical presentation for display on a GUI; and,

receiving first data regarding at least one respective environmental condition, from the plurality of respective environmental conditions, related to the patient, second data regarding at least one symptom of the patient related to physical or mental health of the patient, and background data for the patient; and

a memory element for the at least one specially programmed general-purpose computer for storing the first, second, and background data, wherein the processor is for:

generating, using the first, second, and background data, information regarding at least one concern with respect to the physical or mental health of the patient; and,

generating, using the first, second, and background data, at least one action item for addressing the at least one concern, wherein the interface element is for transmitting at least a portion of the information regarding at least one concern for the physical or mental health of the patient and the at least one action item for display and receiving third data regarding compliance with the at least one action item, wherein the at least one environmental condition is selected from the group consisting of the type of residence in which the patient lives, conditions in the vicinity of the patient's residence, utilities for and infrastructure of the patient's residence, household items associated with the patient's residence, personal items belonging to the patient, transportation options available to the patient, and the patient's perceived level of safety in their residence.

8. The system of claim **7** wherein:

the at least one action item includes an action item directed to an environmental condition from the at least one environmental condition;

the processor is for generating a graphical presentation including at least one inquiry, in the form of a pictorial display, regarding compliance of the patient with the action item directed to an environmental condition; and,

the interface element is for transmitting the graphical presentation for display on a graphical user interface (GUI) and receiving data regarding compliance of the patient with the action item directed to an environmental condition via a GUI on which the graphical presentation is displayed.

9. The system of claim **7** wherein

the interface element is for receiving at least a portion of the first data via the GUI on which the graphical presentation is displayed.

10. The system of claim **7** wherein the at least one action item addresses an environmental condition from the at least one environmental condition.

11. The system of claim **7** wherein:

the processor is for generating an inquiry as to whether the patient wishes further information regarding the at least one health concern;

the interface element is for transmitting the inquiry for display and receiving an affirmative response to the inquiry, including a request for further information regarding a health concern from the at least one health concern;

the processor is for generating information regarding the health concern, the information regarding the health concern more detailed than the information regarding at least one concern for the physical or mental health of the patient; and,

the interface element is for transmitting the information regarding the health concern.

12. A method for managing electronic health records, comprising:

receiving, using an interface element in at least one specially programmed general-purpose computer, first data regarding at least two environmental conditions related to a patient, second data regarding at least one symptom of the patient related to physical or mental health of the patient, and background data for the patient;

storing the first, second, and background data in a memory element for the at least one specially programmed general-purpose computer;

generating, using a processor in the at least one specially programmed general-purpose computer and the first, second, and background data, information regarding at least one concern applicable to the physical or mental health of the patient;

generating, using the processor and the first, second, and background data, at least one action item for addressing the at least one concern;

storing, in the memory element, the at least one action item;

transmitting, using the interface element, at least a portion of the information regarding the at least one concern for the physical or mental health of the patient for display and the at least one action item for display;

receiving, using the interface element, third data regarding compliance with the at least one action item, the third data including information as to whether the at least one action item has been complied with; and,

when the at least one action item has not been complied with, transmitting, using the interface element, the at least one action item for display; or,

when the at least one action item has been complied with, modifying the stored at least one action item to indicate that the at least one action has been complied with; and,

transmitting for display, using the interface element, a message that the at least one action item has been complied with, wherein the at least two environmental conditions are selected from the group consisting of the type of residence in which the patient lives, conditions in the vicinity of the patient's residence, utilities for and infrastructure of the patient's residence, household items associated with the patient's residence, personal items belonging to the patient, transportation options available to the patient, and the patient's perceived level of safety in their residence.

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