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(54) DYNAMICALLY DISPLAYING CURRENT STATUS OF TASKS

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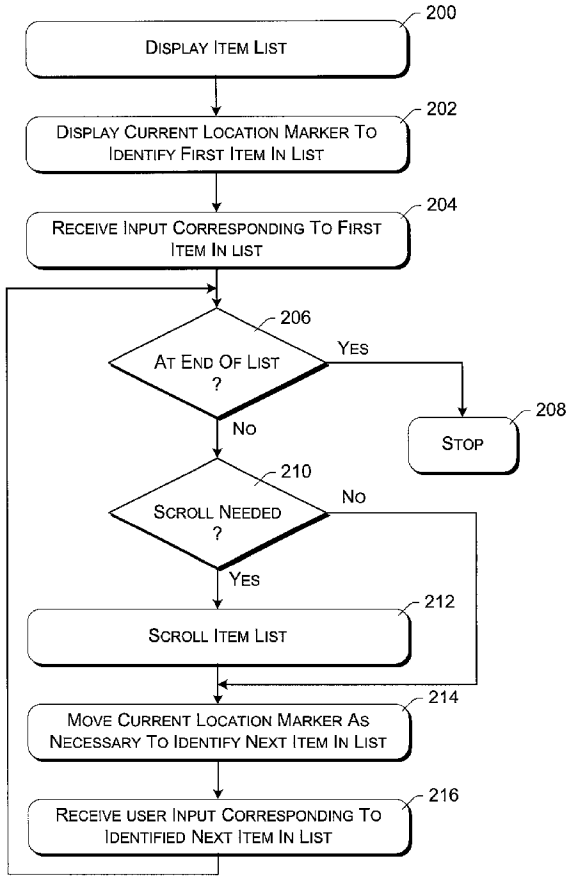
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(57) **ABSTRACT**

The current status of a list of tasks to be performed is dynamically displayed. The tasks may be performed by a user (e.g., data entered by the user, words spoken by the user, actions taken by the user, and so forth) or alternatively by a computer (e.g., the steps it follows in carrying out a programmed task). At least a portion of the list is displayed at any given time along with an indication of which task is the next task to be performed. As the tasks are completed, the current status of the progression through the items on the list is dynamically updated so as to readily inform the user (or someone else) as to what the current task is that needs to be performed, as well as what tasks have already been performed and/or what tasks remain to be performed.



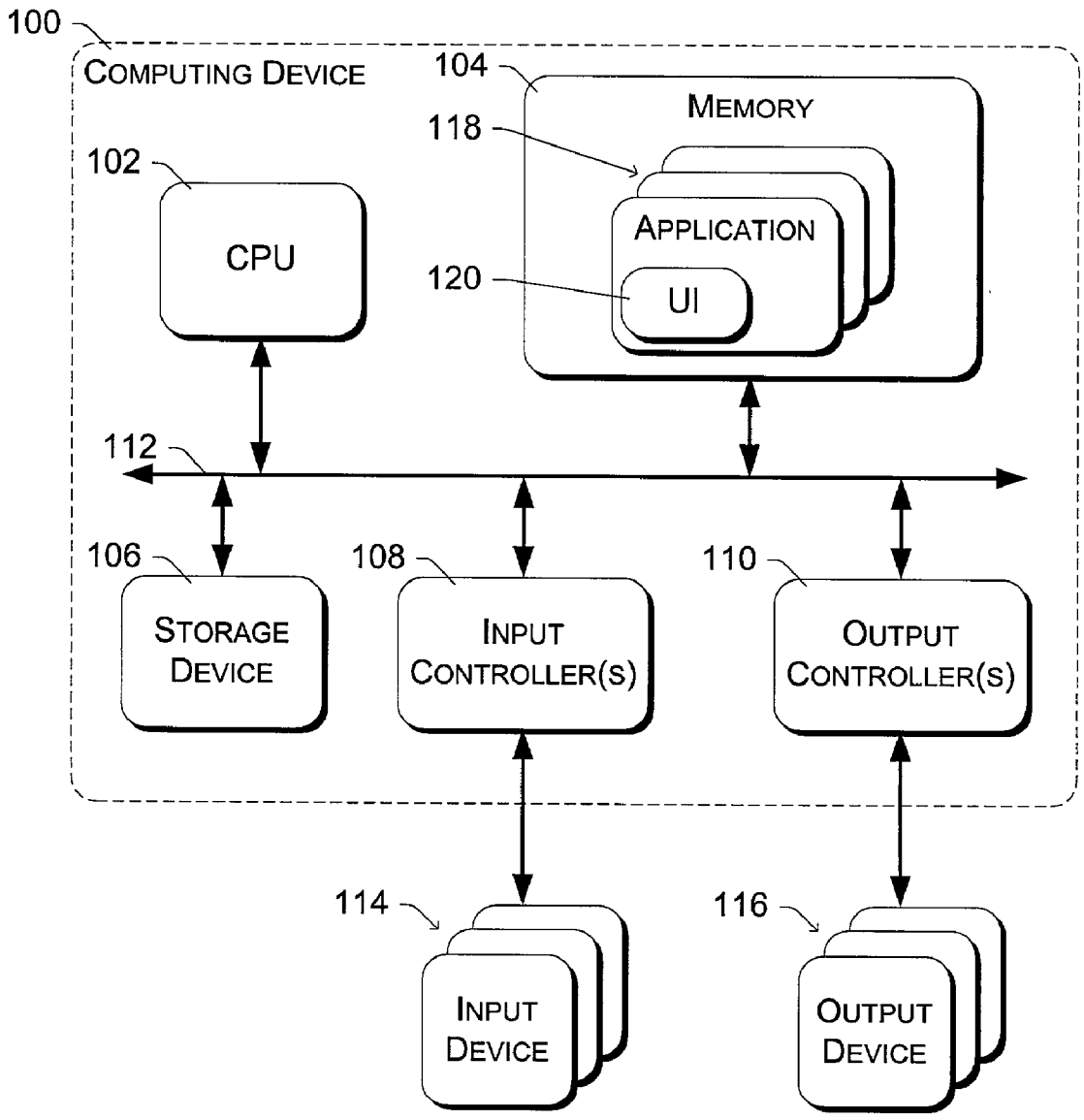

100
COMPUTING DEVICE
104
MEMORY
118
102
CPU
APPLICATION
120
UI
112
106
STORAGE DEVICE
108
INPUT CONTROLLER(S)
110
OUTPUT CONTROLLER(S)
114
INPUT DEVICE
116
OUTPUT DEVICE

Fig. 1

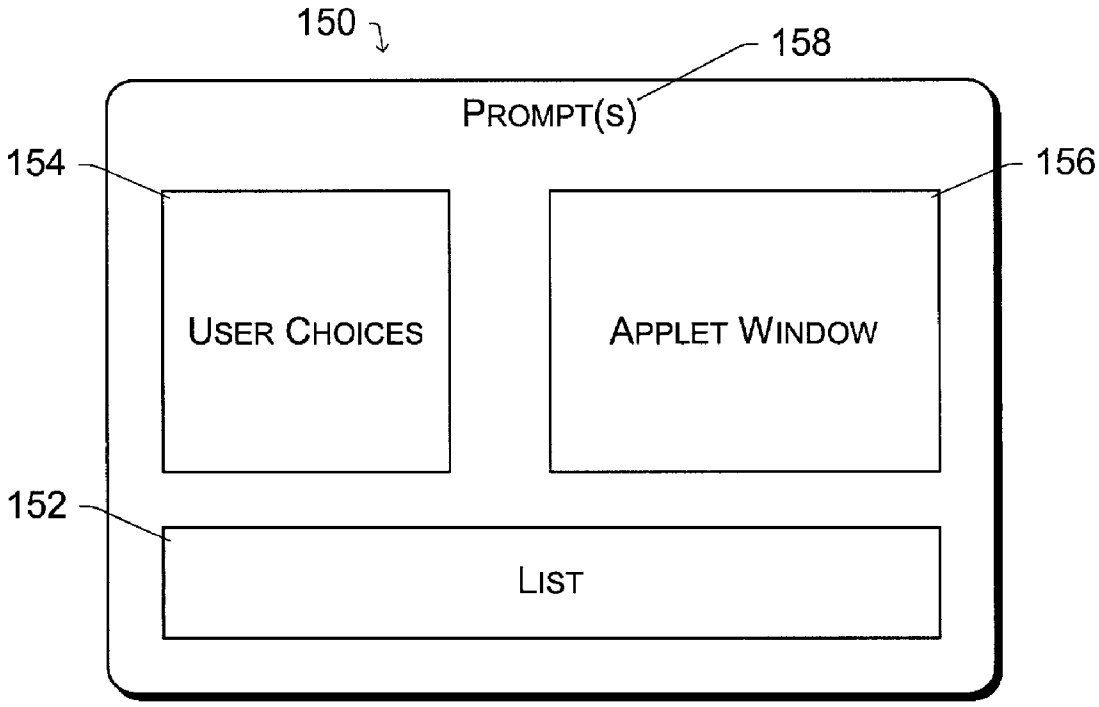


Fig. 2

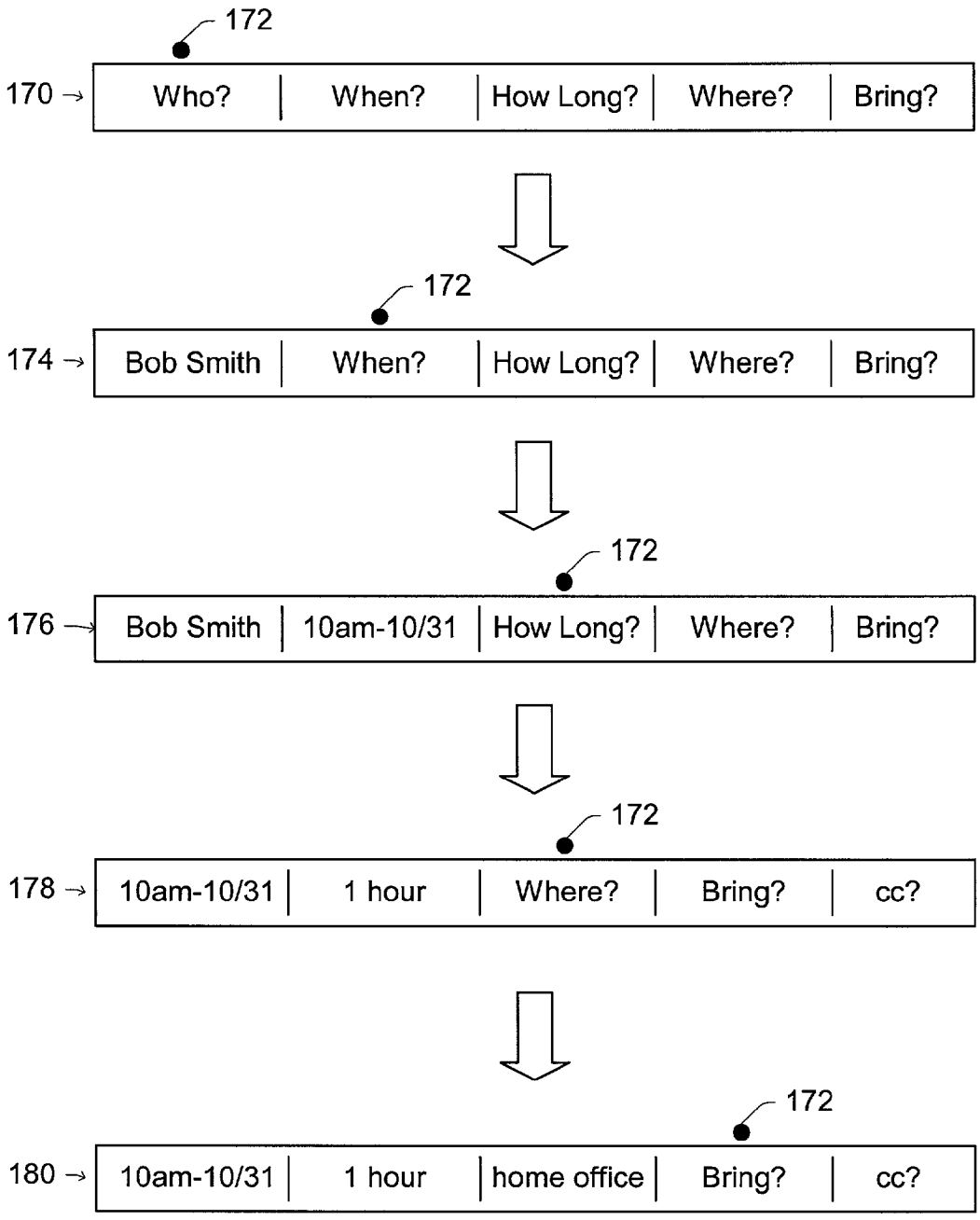

172
170
Who?
When?
How Long?
Where?
Bring?
172
174
Bob Smith
When?
How Long?
Where?
Bring?
172
176
Bob Smith
10am-10/31
How Long?
Where?
Bring?
172
178
10am-10/31
1 hour
Where?
Bring?
cc?
172
180
10am-10/31
1 hour
home office
Bring?
cc?

Fig. 3

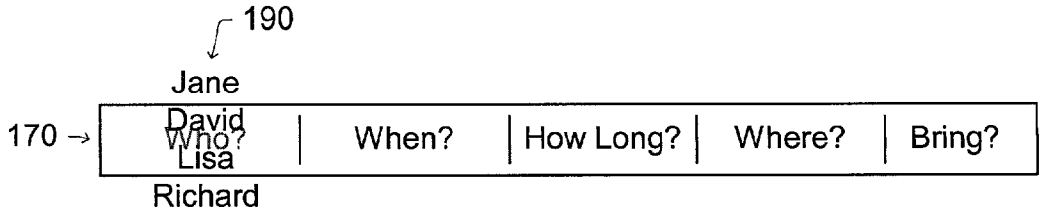

190
Jane
David
Lisa
Richard
170
Who?
When?
How Long?
Where?
Bring?

Fig. 4A

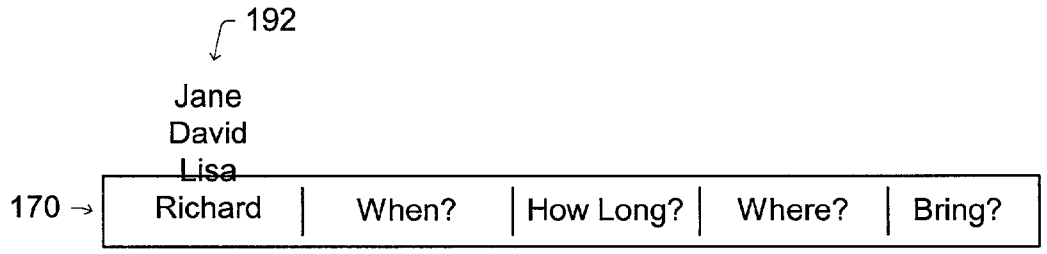

192
Jane
David
Lisa
Richard
170
When?
How Long?
Where?
Bring?

Fig. 4B

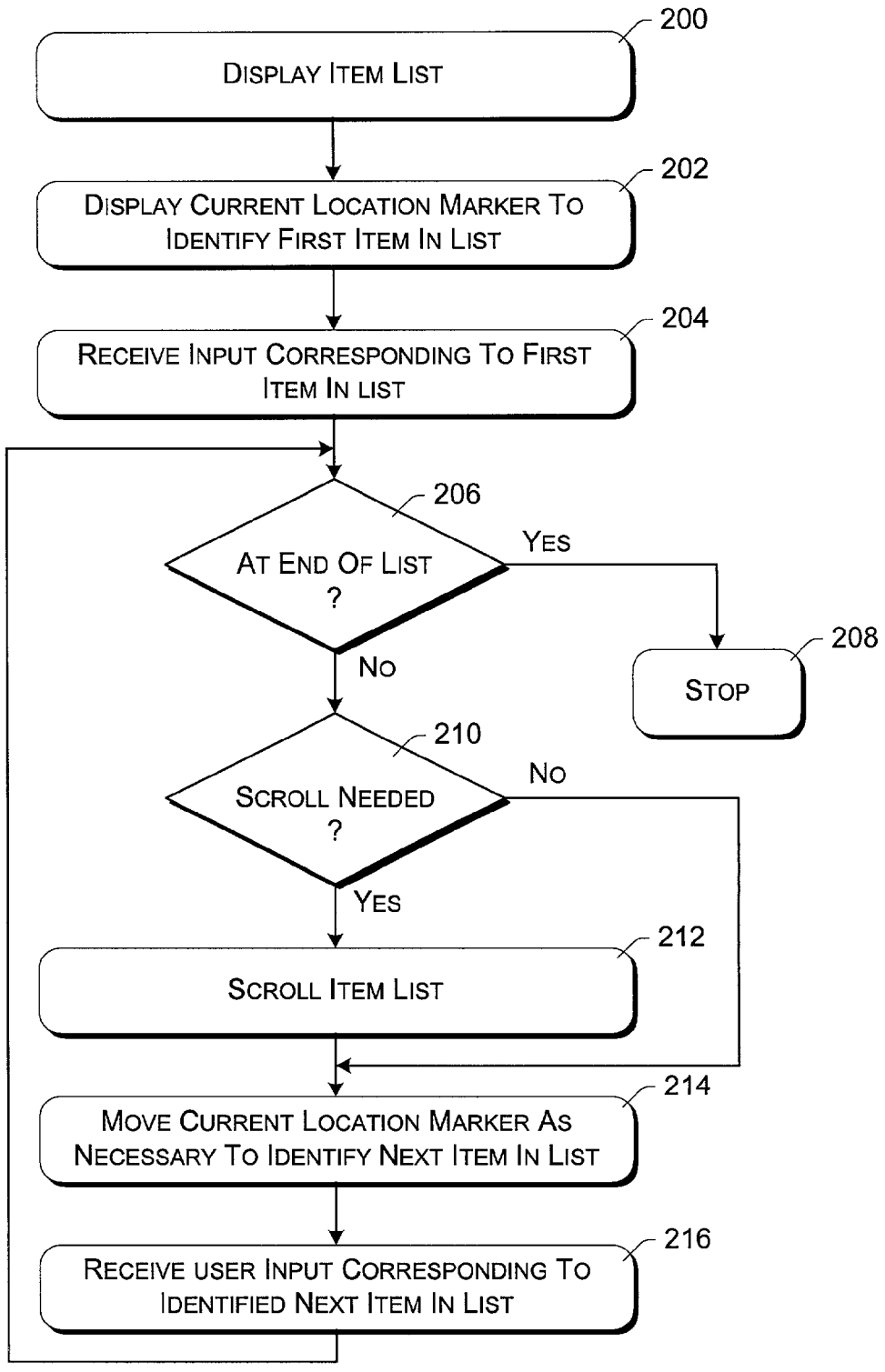

200
DISPLAY ITEM LIST
202
DISPLAY CURRENT LOCATION MARKER TO IDENTIFY FIRST ITEM IN LIST
204
RECEIVE INPUT CORRESPONDING TO FIRST ITEM IN LIST
206
AT END OF LIST ?
YES
208
STOP
NO
210
SCROLL NEEDED ?
NO
YES
212
SCROLL ITEM LIST
214
MOVE CURRENT LOCATION MARKER AS NECESSARY TO IDENTIFY NEXT ITEM IN LIST
216
RECEIVE USER INPUT CORRESPONDING TO IDENTIFIED NEXT ITEM IN LIST

Fig. 5

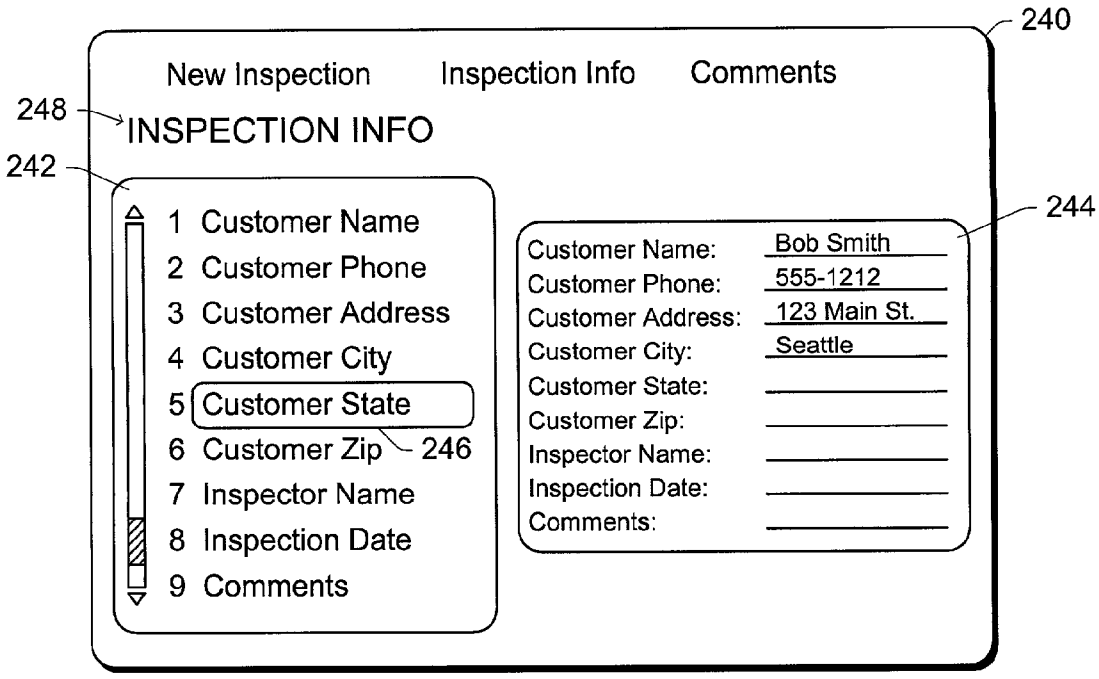

240
New Inspection
Inspection Info
Comments
248
INSPECTION INFO
242
1 Customer Name
2 Customer Phone
3 Customer Address
4 Customer City
5 Customer State
6 Customer Zip
246
7 Inspector Name
8 Inspection Date
9 Comments
244
Customer Name: Bob Smith
Customer Phone: 555-1212
Customer Address: 123 Main St.
Customer City: Seattle
Customer State:
Customer Zip:
Inspector Name:
Inspection Date:
Comments:

Fig. 6

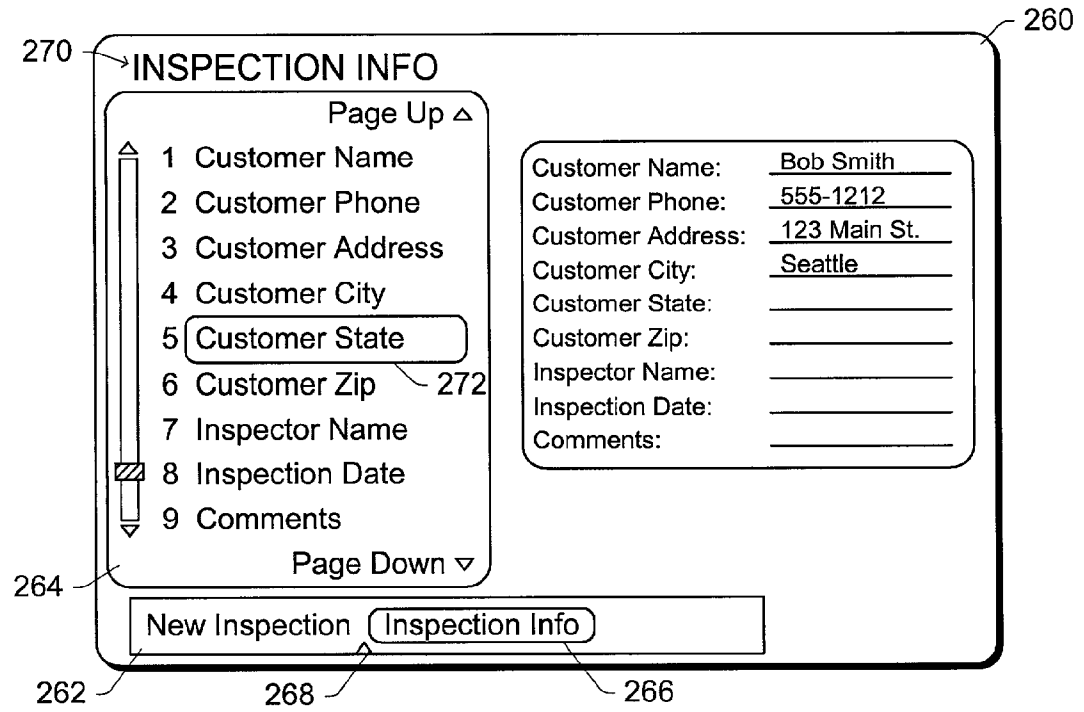

260
270
INSPECTION INFO
Page Up
1 Customer Name
2 Customer Phone
3 Customer Address
4 Customer City
5 Customer State
6 Customer Zip
272
7 Inspector Name
8 Inspection Date
9 Comments
Page Down
264
Customer Name: Bob Smith
Customer Phone: 555-1212
Customer Address: 123 Main St.
Customer City: Seattle
Customer State:
Customer Zip:
Inspector Name:
Inspection Date:
Comments:
New Inspection
Inspection Info
262
268
266

Fig. 7

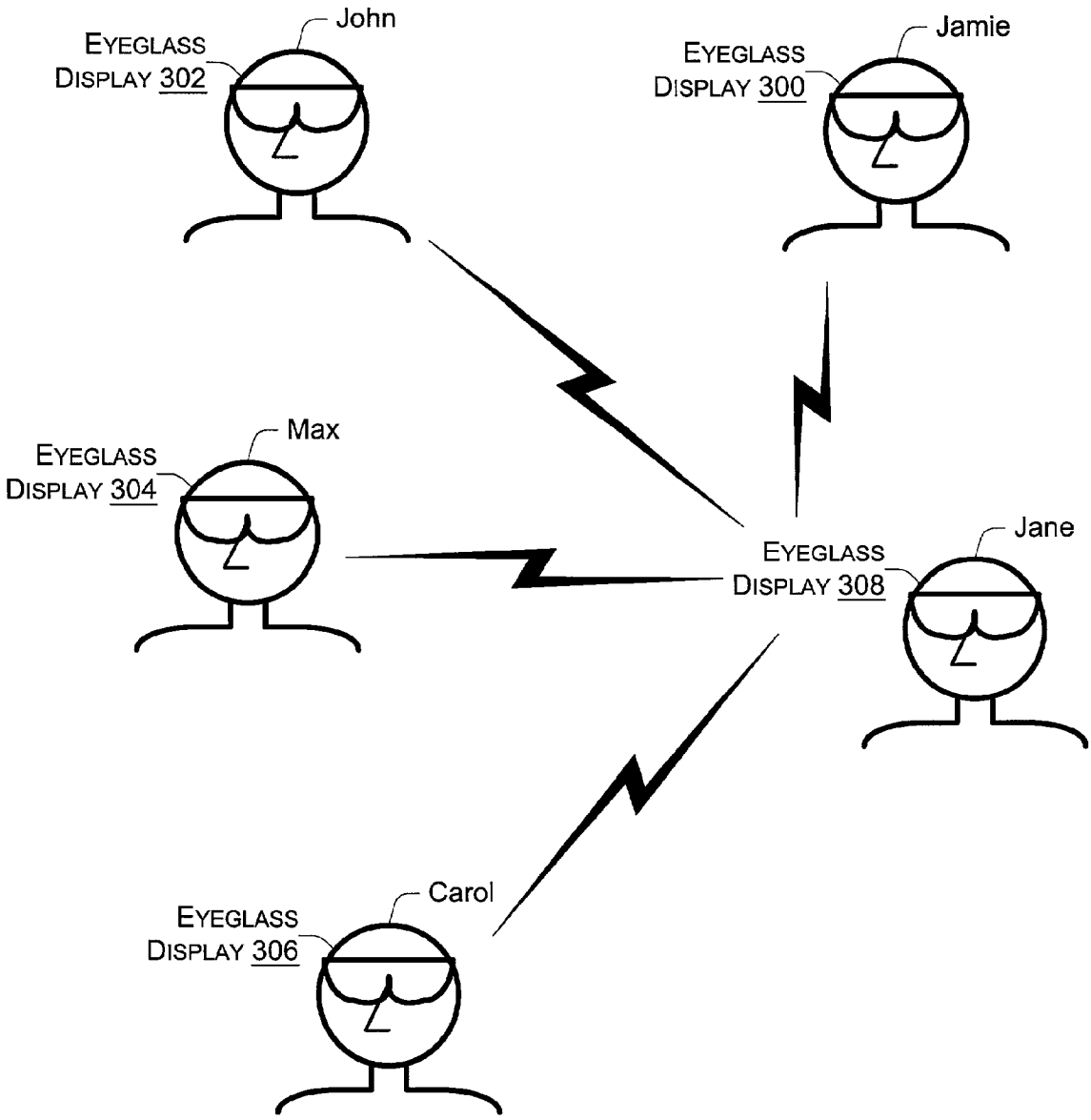

John
EYEGLASS DISPLAY 302
Jamie
EYEGLASS DISPLAY 300
Max
EYEGLASS DISPLAY 304
Jane
EYEGLASS DISPLAY 308
Carol
EYEGLASS DISPLAY 306

Fig. 8

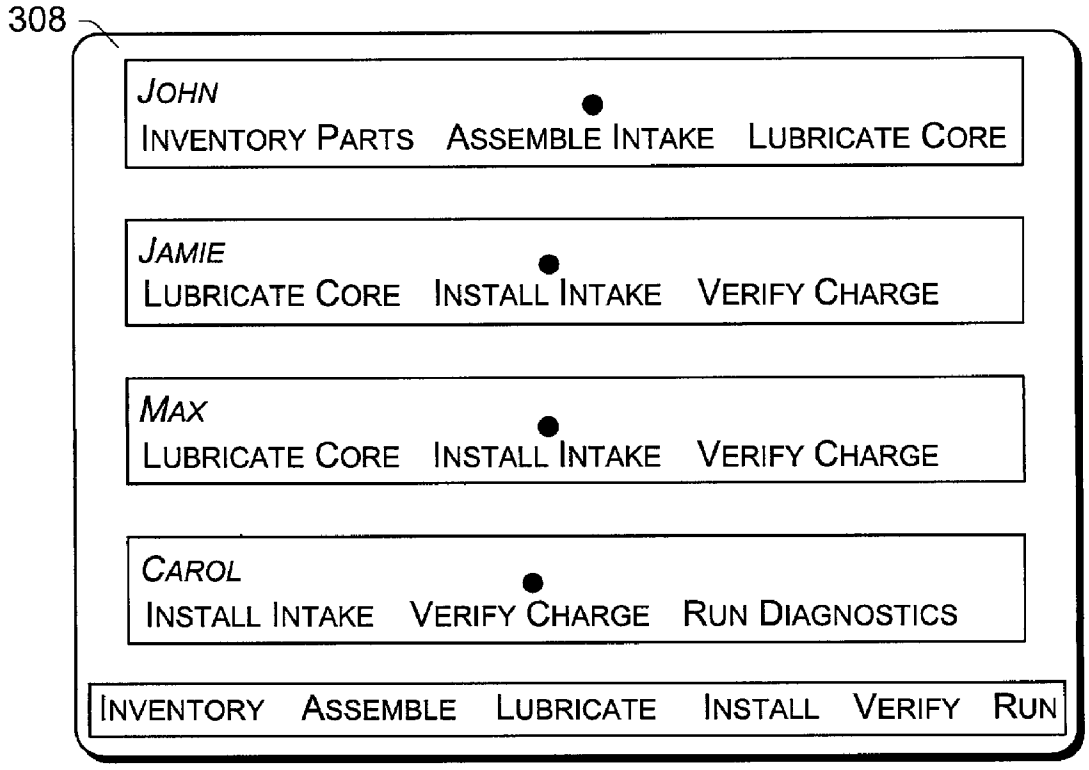

308
JOHN
INVENTORY PARTS
ASSEMBLE INTAKE
LUBRICATE CORE
JAMIE
LUBRICATE CORE
INSTALL INTAKE
VERIFY CHARGE
MAX
LUBRICATE CORE
INSTALL INTAKE
VERIFY CHARGE
CAROL
INSTALL INTAKE
VERIFY CHARGE
RUN DIAGNOSTICS
INVENTORY
ASSEMBLE
LUBRICATE
INSTALL
VERIFY
RUN

Fig. 9

DYNAMICALLY DISPLAYING CURRENT STATUS OF TASKS

RELATED APPLICATIONS

[0001] A claim of priority is made to U.S. Provisional Application No. 60/240,685, filed Oct. 16, 2000, entitled "Method for Dynamically Displaying the Current Status of Tasks".

TECHNICAL FIELD

[0002] The present invention is directed to graphical user interfaces and more particularly to dynamically displaying the current status of tasks.

BACKGROUND

[0003] As computers become increasingly powerful and commonplace, they are being used for an increasingly broad variety of tasks. For example, in addition to traditional activities such as running word processing and database applications, computers are increasingly becoming an integral part of users' daily lives. Programs to schedule activities, generate reminders, and provide rapid communication capabilities are becoming increasingly popular. Moreover, computers are increasingly present during virtually all of a person's daily activities. For example, hand-held computer organizers (e.g., PDAs) are increasingly common, and communication devices such as portable phones are increasingly incorporating computer capabilities. More recently, the field of wearable computers (e.g., with eyeglass displays) has begun to expand, creating a further presence of computers in people's daily lives.

[0004] Computers often progress through a particular series of steps when allowing a user to accomplish a particular task. For example, if a user desires to enter a new name and address to an electronic address book, the computer progresses through a series of steps prompting the user to enter the desired information (e.g., name, street address, city, state, zip code, phone number, etc.). On computers with large displays (e.g., typical desktop computers), sufficient area exists on the display to provide an informative and useable user interface (UI) that allows the user to enter the necessary data for the series of steps. However, problems exist when attempting to guide the user through the particular series of steps on smaller displays. Without the large display area, there is frequently insufficient room to provide the prompts in the same informative and useable manner.

[0005] Additionally, the nature of many new computing devices with small displays (e.g., PDAs and wearable computers) is that the computing devices are transported with the user. However, traditional computer programs are not typically designed to efficiently present information to users in a wide variety of environments. For example, most computer programs are designed with a prototypical user being seated at a stationary computer with a large display device, and with the user devoting full attention to the display. In that environment, the computer program can be designed with the assumption that the user's attention is predominately on the display device. However, many new computing devices with small displays can be used when the user's attention is more likely to be diverted to some other task (e.g., driving, using machinery, walking, etc.). Many traditional computer programs, designed with large display devices in mind, frequently do not allow the user to quickly and easily reorient him-or her-self to the task being carried out by the computer. For example, if the user is performing a task by following a series of steps on a wearable computer, looks away from the display to focus his or her attention on crossing a busy intersection, and then returns to the task, it would be desirable for the user to be able to quickly and easily reorient him- or her-self to the task (in other words, readily know what steps he or she has accomplished so far and what the next step to be performed is).

[0006] Accordingly, there is a need for new techniques to display the current status of tasks to a user.

SUMMARY

[0007] Dynamically displaying current status of tasks is described herein.

[0008] According to one aspect, a list of items corresponding to tasks that are to be performed are displayed. The tasks may be performed by a user (e.g., data entered by the user, words spoken by the user, actions taken by the user, and so forth) or alternatively by a computer (e.g., the steps followed in carrying out a programmed task). At least a portion of the list is displayed at any given time along with an indication of which task is the next task to be performed. As the user progresses through the set of tasks, the current status of his or her progression through the corresponding items on the list is dynamically updated so as to readily inform the user (or someone else) as to what the current task is that needs to be performed, as well as what tasks have already been performed and/or what tasks remain to be performed.

[0009] According to another aspect, only a subset of the list of items is displayed at any given time. The list is scrolled through as the tasks are performed so that different items are displayed as part of the subset as tasks are performed.

[0010] According to another aspect, multiple lists of tasks to be performed by multiple individuals (or computing devices) are displayed on a display of the user. As the multiple individuals (or computing devices) finish the tasks in their respective lists, an indication of such completion is forwarded to the user's computer, which updates the display to indicate the next task in the list to be displayed. The user is thus able to monitor the progress of the multiple individuals (or computing devices) in carrying out their respective tasks.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention is illustrated by way of example and not limitation in the figures of the accompanying drawings. The same numbers are used throughout the figures to reference like components and/or features.

[0012] **FIG. 1** illustrates an exemplary computing device such as may be used in accordance with certain embodiments of the invention.

[0013] **FIG. 2** illustrates an exemplary user interface display in accordance with certain embodiments of the invention.

[0014] **FIG. 3** illustrates an exemplary display of an item list and current location marker such as may be used in accordance with certain embodiments of the invention.

[0015] **FIGS. 4A and 4B** illustrates different ways in which the prompt in a sequence can be changed.

[0016] **FIG. 5** is a flowchart illustrating an exemplary process for displaying the current status of tasks in accordance with certain embodiments of the invention.

[0017] **FIGS. 6 and 7** illustrate alternative displays of the item list and current location identifiers with reference to a sequence of tasks to be completed in order to record a new inspection (e.g., a building inspection).

[0018] **FIG. 8** illustrates an exemplary distributed environment in which the status of tasks being performed by multiple users can be monitored.

[0019] **FIG. 9** illustrates an exemplary group of lists that may be displayed for the distributed environment of **FIG. 8**.

DETAILED DESCRIPTION

[0020] Dynamically displaying the current status of tasks is described herein. A list of items or prompts that is to be traversed by a user in a particular order is displayed to the user (e.g., a set of tasks the user is to perform in a particular sequence as part of his or her job, a set of words to be spoken, a list of questions or fields to be answered, and so forth). At least a portion of the list is displayed at any given time along with an indication of which item in the list is the next item that the user needs to handle (e.g., the next task to perform, the next word to speak, the next question to answer, and so forth). As the user progresses through the list of tasks, the current status of his or her progression through the prompts on the list is dynamically updated so as to readily inform the user as to what the current task is that needs to be performed, as well as what tasks have already been performed and/or what tasks remain to be performed.

[0021] **FIG. 1** illustrates an exemplary computing device **100** such as may be used **18** in accordance with certain embodiments of the invention. Computing device **100** represents a wide variety of computing devices, such as wearable computers, personal digital assistants (PDAs), handheld or pocket computers, telephones (e.g., cell phones), laptop computers, gaming consoles or portable gaming devices, desktop computers, Internet appliances, etc. Although the dynamic displaying of current status of tasks described herein is particularly useful if computing device has a small display, any size display may be used with the invention.

[0022] Computing device **100** includes a central processing unit (CPU) **102**, memory **104**, a storage device **106**, one or more input controllers **108**, and one or more output controllers **110** (alternatively, a single controller may be used for both input and output) coupled together via a bus **112**. Bus **112** represents one or more conventional computer buses, including a processor bus, system bus, accelerated graphics port (AGP), universal serial bus (USB), peripheral component interconnect bus (PCI), etc.

[0023] Memory **104** may be implemented using volatile and/or non-volatile memory, such as random access memory (RAM), read only memory (ROM), Flash memory, electronically erasable programmable read only memory (EEPROM), disk, and so forth. Storage device **106** is typically implemented using non-volatile "permanent" memory, such as ROM, EEPROM, magnetic or optical diskette, memory cards, and the like.

[0024] Input controller(s) **108** are coupled to receive inputs from one or more input devices **114**. Input devices **114** include any of a variety of conventional input devices, such as a microphone, voice recognition devices, traditional qwerty keyboards, chording keyboards, half qwerty keyboards, dual forearm keyboards, chest mounted keyboards, handwriting recognition and digital ink devices, a mouse, a track pad, a digital stylus, a finger or glove device to capture user movement, pupil tracking devices, a gyropoint, a trackball, a voice grid device, digital cameras (still and motion), and so forth.

[0025] Output controller(s) **110** are coupled to output data to one or more output devices **116**. Output devices **116** include any of a variety of conventional output devices, such as a display device (e.g., a hand-held flat panel display, an eyeglass-mounted display that allows the user to view the real world surroundings while simultaneously overlaying or otherwise presenting information to the user in an unobtrusive manner), a speaker, an olfactory output device, tactile output devices, and so forth.

[0026] One or more application programs **118** are stored in memory **104** and executed by CPU **102**. When executed, application programs **118** generate data that may be output to the user via one or more of the output devices **116** and also receive data that may be input by the user via one or more of the input devices **114**. For discussion purposes, one particular application program is illustrated with a user interface (UI) component **120** that is designed to present information to the user including dynamically displaying the current status of tasks as discussed in more detail below.

[0027] Although discussed herein primarily with reference to software components and modules, the invention may be implemented in hardware or a combination of hardware, software, and/or firmware. For example, one or more application a**5** specific integrated circuits (ASICs) could be designed or programmed to carry out the invention.

[0028] **FIG. 2** illustrates an exemplary user interface display in accordance with certain embodiments of the invention. User interface display **150** can be, for example, the display generated by user interface **120** of **FIG. 1**. UI display **150** includes an item or prompt list portion **152**, a user choices portion **154**, and an applet window portion **156**. Additional labels or prompts **158** may also be included (e.g., a title for the task being handled, the current time, the amount of time left to finish the task, etc.). List portion **152** displays a list that prompts the user of tasks that are to be handled by the user in a particular order. An indication is also made to the user within list portion **152** of where the user currently is in that list (that is, what the next item or task is that needs to be handled by the user), and also identifies items or tasks (if any) that have already been handled by the user as well as future items or tasks (if any) that need to be handled by the user. The manner in which an item or task is handled by the user is dependent on the nature of the list, as discussed in more detail below.

[0029] User choices portion **154** displays the options for the user to select from based on the next item or task in the list that needs to be handled by the user. For example, assume that the list in portion **152** is a list prompting the user regarding what information needs to be gathered in order for the user to set up a meeting with a potential customer. The list of prompts in list portion **152** could be a list of tasks the

user must perform—that is, a list of information that needs to be collected (e.g., the customer's name, the location of the meeting, the time of the meeting, and so forth). If we further assume that the current task that needs to be handled by the user is entry of the location of the meeting, user choices portion **154** could display the various permissible inputs for the location of the meeting (e.g., at the user's main office, at a remote office, at the customer's facility, and so forth).

[**0030**] By way of another example, the item list may be a list of prompts for the information to be verbally input by the user in each step, with user choices portion **154** displaying a list of which words can be spoken in each step.

[**0031**] Applet window portion **156** displays additional information clarifying or amplifying the choices in user choices portion **154** (or the current item or task in item list portion **152**). Following the previous example, if the current task that needs to be handled by the user is entry of the location of the meeting, applet window portion **156** could display additional descriptive information for one or more of the permissible inputs for the location of the meeting (e.g., a street address, a distance from the user's home, a map flagging the locations of the various meeting locations, and so forth).

[**0032**] The list displayed in list portion **152** is a list of items that is to be traversed by a user in a particular order. This can be a list of task prompts regarding tasks that the user is to perform, a list of tasks prompts regarding tasks to be performed by another user or computer, and so forth. Any of a wide variety of lists can be displayed, such as a set of tasks the user is to perform in a particular sequence as part of his or her job (this can be used, for example, to assist in training users to do their jobs), a set of tasks the user is to perform in a particular sequence in order to assemble or install a product he or she has purchased, a set of words to be spoken (e.g., queues as to what voice inputs the user is to make in order to carry out a task), a list of questions or fields to be answered, and so forth. Alternatively, the list of items may be a list of tasks or steps to be performed by a computer or computer program. Such a list can be used, for example, by a user to track the process of the computer or program in carrying out the particular sequence of steps. Additionally, depending on the nature of the sequence of tasks being performed, multiple lists of items may be displayed (e.g., a multi-tiered item list).

[**0033**] Situations can arise in which the list of items or prompts is too large to be displayed in its entirety. In such situations, only a portion of the list is displayed (e.g., centered on the item or prompt for the next task to be performed). This subset of the steps to be performed is then scrolled as tasks are completed, resulting in a dynamic list display that changes when a task is completed.

[**0034**] By displaying the list of prompts (or at least a portion thereof), the user is able to readily identify the status of the set of tasks being performed (in other words, the user is also able to obtain a feel for where he or she is (or where the user or computer being monitored is) in progressing through the sequence of tasks). The user is able to quickly identify one or more previous tasks (if any) in the sequence, as well as one or more future tasks (if any) in the sequence. Such information is particularly helpful in reorienting the user to the sequence of tasks if his or her attention has been diverted away from the sequence. For example, the user's attention may be diverted away from the sequence to answer questions from another employee. After answering the question, the user can look back at display **150** and quickly reorient him- or her-self into the sequence of tasks being performed.

[**0035**] Item lists may be a set of predetermined items, such as a particular set of steps to be followed to assemble a machine or a set of words to be uttered to carry out a task for a speech-recognizing computer. Alternatively, item lists may be dynamic, changing based on the user's current location, current activity, past behavior, etc. For example, computer **100** of **FIG. 1** may detect where the user is currently located (e.g., in his or her office, in the assembly plant, which assembly plant, etc.), and provide the appropriate instructions to perform a particular task based on that current location. Additional information regarding detecting the user's current context (e.g., current location, current activity, etc.) can be found in a co-pending U.S. patent application Ser. No. 09/216,193, entitled "Method and System For Controlling Presentation of Information To a User Based On The User's Condition", which was filed Dec. 18, 1998, and is commonly assigned to Tangis Corporation. This application is hereby incorporated by reference.

[**0036**] **FIG. 3** illustrates an exemplary display of an item list and current location marker such as may be used in accordance with certain embodiments of the invention. Assume that the sequence of items on the list is a set of prompts regarding information that needs to be supplied by the user in order to schedule a meeting. In the illustrated example, this list includes the following information: who the meeting is with (who), the date and time for the meeting (when), the duration of the meeting (how long), the location of the meeting (where), an indication of any materials to bring to the material (bring), and an indication of anyone else that should be notified of the meeting (cc).

[**0037**] **FIG. 3** illustrates an example item list displayed in list portion **152** of **FIG. 2**. Initially, the item list **170** is displayed, including the following prompts: "who?", "when?", "how long?", "where?", and "bring?". The prompts in list **170** provide a quick identification to the user of what information he or she needs to input for each task in the sequence of tasks for scheduling a meeting. Due to the limited is display area, list **170** does not include the prompts for each step in the sequence, but rather scrolls through the prompts as discussed in more detail below. A current location marker **172** is also illustrated in **FIG. 3** to identify to the user what the current step is in the sequence. Assuming the meeting scheduling process has just begun, the first step in the sequence is to identify who the meeting is with (who), which is identified by current location marker **172** being situated above the prompt "who?". In the illustrated example, location marker **172** is a circle or ball. Alternatively, other types of presentation changes may be made to alter the appearance of a prompt (or area surrounding a prompt) in order to distinguish the current step from other steps in the sequence. For example, different shapes other than a circle or ball may be used for a location marker, the text for the prompt may be altered (e.g., a different color, a different font, a different size, a different position on screen (e.g., slightly higher or lower than other prompts in the list), and so forth), the display around the prompt may be altered (e.g., the prompt may be inverted so that it appears white on a black background rather than the more traditional black on

a white background, the prompt may be highlighted, the prompt may be encircled by a border, and so forth), etc. Those skilled in the art can easily determine a variety of alternate methods for marking the current step.

[0038] One additional presentation change that can be made to distinguish the current step from other steps in the sequence is to change the prompt itself. The prompt could be replaced with another prompt, or another prompt could be superimposed on the prompt for the current step. For example, the user may have a set of individuals that he or she typically meets with, and these may be superimposed on the "who?" prompt when it is the current step. FIGS. **4A- 4B** illustrates different ways in which the prompt in a sequence can be changed. **FIG. 4A** illustrates an example item list with the prompt for the current step in the sequence being superimposed with various input options. A list **190** is illustrated and the current step is to input who the meeting is to be with (the "who?" prompt). As illustrated, a set of common people that the user schedules meetings with (Jane, David, Lisa, and Richard) are superimposed on the "who?" prompt. The appearance of the underlying prompt "who?" may be changed (e.g., shadowed out, different color, etc.) in order for overlying input options to be more easily viewed. It is to be appreciated that the exact location of the superimposed set of input options can vary (e.g., the characters of one or more input options may overlap the prompt, or be separated from the prompt).

[0039] **FIG. 4B** illustrates an example item list with the prompt for the current step in the sequence being replaced by the set of input options. A list **192** is illustrated and the current step is to input who the meeting is to be with (the "who?" prompt). However, as illustrated, the "who?" prompt is replaced with a set of common people that the user schedules meetings with (Jane, David, Lisa, and Richard).

[0040] The user is thus given an indication of both the current step in the sequence as well as common responses to that step. The type of information that is superimposed on or replaces the prompt can vary based on the current step. For example, when the "when?" prompt is the current step it may have superimposed thereon the times that the user is available for the current day (or current week, and so forth).

[0041] Returning to **FIG. 3**, once the user enters the information identifying who the meeting is with (assume for purposes of this example the meeting is with Bob Smith), list **170** is changed to list **174** in which the prompt "who?" is replaced with the name "Bob Smith" and the current location marker **172** is changed to indicate the next prompt ("when?") is the current task that needs to be handled by the user. Assuming the user inputs that the meeting is to occur at 1Oam on October **31**, list **174** is changed to list **176** in which the prompt "when?" is replaced with the date and time of the meeting, and the current location marker **172** is changed to indicate the next prompt ("how long?") is the current task that needs to be handled by the user. Thus, as can be seen from lists **172, 174**, and **176**, the current location marker **172**"bounces" along the list from item to item, making the user readily aware of what the current task is that he or she should be performing (that is, which data he or she should be inputting in the present example).

[0042] Once the user inputs the duration of the meeting, list **176** is changed to list **178**. Given the limited display area, the user interface now scrolls the list so that the leftmost item is no longer shown but a new item is added at the right. Thus, the identification of "Bob Smith" is no longer shown, but a prompt for who else should be notified of the meeting ("cc?") is now shown. Once the user enters the location for the meeting ("home office"), list **178** is changed to list **180** and current location marker **172** is changed to indicate the next prompt ("bring?") is the current task that needs to be handled by the user. Thus, as can be seen with lists **176, 178**, and **180**, current location marker **172** may not be moved in response to an input but the list may be scrolled.

[0043] Thus, as can be seen in **FIG. 3**, the item list provides a series of prompts identifying what tasks (if any) in the sequence have already been performed and what tasks (if any) remain to be performed. For those tasks that have already been performed, an indication is made in the list as to what action was taken by the user for those tasks (e.g., what information was entered by the user in the illustrated example). Thus, the user can readily orient him- or her-self to the sequence of steps, even if his or her attention is diverted from the display for a period of time. Alternatively, the prompts in the list need not be changed when the user enters the data (e.g., "who?" need not be replaced by "Bob Smith"). The data input by the user can alternatively be displayed elsewhere (e.g., in applet window portion **156**).

[0044] One advantage of the item lists described herein is that the lists present the multiple steps or items in a concise manner - these steps or items can also be referred to as idioms. When these idioms are presented together in a sequence, the provide more information to the user than when presented in independent form. For example, the idiom "bring?" by itself does not present as much information to the user as the entire sequence of idioms "who?", "when?", "how long?", "where?", and "bring?".

[0045] The use of item lists as described herein also allows an individual to "zoom" in on (and thus gain more information about) a particular task. For example, with reference to **FIG. 3**, the user is able to select and zoom in on the "where?" prompt and have additional information about that task displayed (e.g., the possible locations for the meeting). The user is able to "backtrack" through the list (e.g., by moving a cursor to the desired item and selecting it, or using a back arrow key or icon, or changing the current location marker (e.g., dragging and dropping the location marker to the desired item), etc.) and see this additional information for tasks already completed. Alternatively, the "backtracking" may be for navigational rather than informational purposes. Moving back through the list (whether by manipulation of the location marker or in some other manner) may also be used to accomplish other types of operations, such as defining a macro or annotation.

[0046] Additionally, by displaying the prompts for future items, the speed of handling of the sequence of the items by the user can potentially be increased. For example, the user can see the prompt for the next one or more items in the list and begin thinking about how he or she is going to handle that particular item even before the computing device is finished processing the input for the item he or she just handled.

[0047] According to another embodiment, multiple location markers are displayed along with the item list—one marker identifying the current item to be handled by the user and another marker identifying the current item being pro-

cessed by the computing device. Situations can arise where the user can input data quicker than it can be processed by the computing device. For example, the user may be able to talk at a faster rate than the computing device is able to analyze the speech.

[0048] The use of two such markers can allow the user to identify if the computing device is hung up on or having difficulty processing a particular input (e.g., identify a particular word spoken by the user, misrecognition of the input, improper parsing, etc.), the user can identify this situation and go back to the task the computing device is having difficulty processing and re-enter the speech.

[0049] **FIG. 5** is a flowchart illustrating an exemplary process for displaying the current status of tasks in accordance with certain embodiments of the invention. The process of **FIG. 5** is carried out by the user interface of a computing device (e.g., interface **120** of **FIG. 1**), and may be performed in software. Although **FIG. 5** is discussed with reference to a location marker, it is to be appreciated that any of the presentation changes discussed above an be used to identify items in the list.

[0050] Initially, an item list is displayed (act **200**), which is a sequence of items or prompts for the user to follow. A current location marker is also displayed to identify the first item in the list (act **202**), and input corresponding to the first item in the list is received (act **204**). The nature of this input can vary depending on the sequence of tasks itself (e.g., it may be data input by a user, an indication from another computer program that the task has been accomplished, etc.). A check is then made as to whether the end of the list has been reached (at **206**). If the end of the list has been reached then the process stops (act **208**), waiting for the next sequence of tasks to begin or for the user to backtrack to a previously completed task.

[0051] However, if the end of the list has not been reached, then a check is made as to whether scrolling of the list is needed (act **210**). Whether scrolling of the list is needed can be based on a variety of different factors. For example, the user interface may attempt to make sure that there are always at least a threshold number of prompts before and/or after the current location marker, the user interface may attempt to make sure that the current task remains as close to the center of the item list as is possible but that no portions of the item list be left empty, etc. These factors can optionally be user-configurable preferences, allowing the user to adjust the display to his or her particular likes and/or dislikes (e.g., the user may prefer to see more future tasks than previous tasks).

[0052] If scrolling is needed, then the item list is scrolled by one item (or alternatively more items) in the appropriate direction (act **212**). The amount that the item list is scrolled can vary (e.g., based on the sizes of the different items in the list). The appropriate direction for scrolling can vary based on the activity being performed by the user and the layout of the list (e.g., in the example of **FIG. 3**, the scrolling is from right to left when progressing forward through the list, and left to right when backtracking through the list). Regardless of whether the ordered item list is scrolled, after act **210** or **212** the current location marker is moved as necessary to identify the next item in the list that is to be handled by the user (act **214**). In some situations, movement of the current location marker may not be necessary due to the scrolling performed (e.g., as illustrated with reference to lists **176** and **178** in **FIG. 3**). At some point after the current location marker is moved (if necessary), user input is received corresponding to the identified next item in the list (act **216**). The process then returns to determine whether the end of the list has been reached (act **206**).

[0053] The item list and current location identifier or marker can be displayed in a wide variety of different manners. **FIGS. 6 and 7** illustrate alternative displays of the item list and current location identifiers with reference to a sequence of tasks to be completed in order to record a new inspection (e.g., a building inspection). In the exemplary display **240** of **FIG. 6**, an item list portion **242** and an applet window portion **244** are illustrated. The item list portion **242** includes a list of tasks that are to be handled by the user, each of which is information to be entered by the user. Once entered, the information is displayed in applet window portion **244**. A current location marker **246** advances down the list in portion **242** to identify the current information that the user needs to input (the customer's state in the illustrated display). Additional information is displayed at the top of display **240**, including a prompt **248** identifying a type of information being entered by the user (inspection information).

[0054] In the exemplary display **260** of **FIG. 7, a** multi-tiered item list is displayed including list portion **262** and list portion **264**. In list portion **262**, prompts for the overall process of recording a new inspection are listed, including selecting a new inspection option and then entering inspection information. Two current location markers **266** and **268** are illustrated, each providing a visual indication of where in the overall process the current user is (inspection info in the illustrated display). A prompt **270** provides a further identification to the user of where he or she is in the overall process. List portion **264** includes prompts for the process of entering inspection information, with a current location marker **272** providing a visual indication of where in the inspection information entry process the user currently is (customer state in the illustrated display).

[0055] In addition to tracking the status of tasks being performed by a single user, the dynamic displaying of the current status of tasks of the present invention can further be used to track the status of tasks being performed by multiple users. In this situation, information indicating the status of tasks being performed by multiple users is communicated back to the computing devices of one or more other users, who in turn can view the status information of multiple users on a single display.

[0056] **FIG. 8** illustrates an exemplary distributed environment in which the status of tasks being performed by multiple users can be monitored. In the illustrated example, multiple users Jamie, John, Max, and Carol each have a wearable computer with an eyeglass display **300**, **302**, **304**, and **306**, respectively. An item list is displayed on the eyeglass display for each of these users, with a current location marker to identify to the respective users where they are in the task sequences they are performing. Information regarding their current location is also communicated to another computing device of their supervisor Jane, who is also wearing an eyeglass display **308**. The information communicated to Jane's computer can be simply an identification of the current location (e.g., Jane's **1**s com-

puter may already be programmed with all of the tasks in the list), or alternatively the entire (or at least a portion of) the item list. The information for one or more of the users Jamie, John, Max, and Carol can then be displayed on display **308**, allowing Jane to keep track of the status of each of the users Jamie, John, Max, and Carol in performing their tasks. This allows Jane, as the supervisor, to see if people are proceeding through their tasks too quickly or too slowly (e.g., a user may be having difficulty and need assistance), to know when the individual users will be finished with their tasks, etc. If a multi-tiered item list is being used, then the supervisor can also zoom in on the particular step of a user and get additional information regarding where the user is stuck.

[**0057**] **FIG. 9** illustrates an exemplary group of lists that may be displayed on eyeglass display **308** of **FIG. 8**. Assume that each of the users John, Jamie, Max, and Carol are each performing a machine assembly process involving the following tasks: inventory the necessary parts, assemble an intake, lubricate a core part of the machine, install the assembled intake, verify that the batteries are fully charged, and then run a diagnostic program. The tasks in the machine assembly process are illustrated in a portion **310** of display **308** in an abbreviated form. Alternatively, the tasks illustrated in portion **310** may not be abbreviated, or may be represented in some other manner (e.g., as icons). A separate item list is displayed on display **308** for each of the users along with a corresponding current ii location marker in the shape of a ball or circle. Thus, as illustrated in **FIG. 9**, the viewer of display **308** can readily identify that John is at the "assemble intake" step, Jamie and Max are both at the "install intake" step, and Carol is at the "verify charge" step. Thus, the supervisor viewing display **308** can quickly and easily determine, based on the item list and current location markers, that each of Jamie, Max, and Carol is proceeding normally through the assembly process, but that John is hung up on the "assemble intake" step, so the supervisor can check with John to see if he is experiencing difficulties with this step.

[**0058**] Conclusion

[**0059**] Although the description above uses language that is specific to structural features and/or methodological acts, it is to be understood that the invention defined in the appended claims is not limited to the specific features or acts described. Rather, the specific features and acts are disclosed as exemplary forms of implementing the invention.

1. One or more computer-readable media storing a computer program that, when executed by one or more processors, causes the one or more processors to:

display a subset of a plurality of steps in an order to be performed by a user;

altering an appearance of a current step in the subset of steps that needs to be performed by the user to distinguish the current step from other steps in the subset;

allowing the user to input data corresponding to the current step; and

scrolling, in response to user input of data corresponding to the current step, the plurality of steps so that a new subset of the plurality of steps is presented to the user.

2. One or more computer-readable media as recited in claim 1, wherein the computer program further causes the one or more processors to:

alter, in response to user input of data corresponding to the current step, the appearance of another step as necessary to identify the new current step in the subset of steps that needs to be performed by the user.

3. One or more computer-readable media as recited in claim 1, wherein altering the appearance of the current step comprises marking the current location with a ball.

4. One or more computer-readable media as recited in claim 1, wherein altering the appearance of the current step comprises displaying the current step differently than other steps in the subset.

5. One or more computer-readable media as recited in claim 1, wherein altering the appearance of the current step comprises replacing the current step with a set of one or more input options for the current step.

6. One or more computer-readable media as recited in claim 1, wherein altering the appearance of the current step comprises superimposing, on the current step, a set of one or more input options for the current step.

7. One or more computer-readable media as recited in claim 1, wherein the computer program further causes the one or more processors to:

replace, in the subset, the display of the current step with a display of the input data.

8. One or more computer-readable media as recited in claim 1, wherein the computer program further causes the one or more processors to:

display a current processing marker that identifies which step in the subset of steps is currently being processed by the one or more processors.

9. One or more computer-readable media as recited in claim 1, wherein the one or more computer-readable media comprise a computer memory of a wearable computer.

10. A method comprising:

displaying a list of items to be handled by a user in a particular order;

identifying one item in the list of items that is the current item;

receiving a user input corresponding to the current item; and

updating, in response to receiving the user input, the identification of the one item that is the current item to indicate the next item in the list of items as the current item.

11. A method as recited in claim 10, wherein displaying the list of items comprises displaying at least one item corresponding to a task that has already been performed and at least one item corresponding to a task that still needs to be performed by the user.

12. A method as recited in claim 10, wherein displaying the list of items comprises displaying, after the user input is received, the user input in place of the corresponding item.

13. A method as recited in claim 10, wherein displaying the list of items comprises displaying only a subset of the list of items at any given time.

14. A method as recited in claim 13, further comprising scrolling through the list of items to display different subsets as items in the list are handled by the user.

15. A method as recited in claim 10, further comprising displaying a current processing marker identifying an item in the list of items corresponding to a current user input being processed.

16. A method as recited in claim 10, wherein the list of items comprises a list of tasks to be completed by the user, and wherein handling of an item by the user comprises the user completing the task.

17. A method as recited in claim 16, wherein the list of tasks comprises a list of prompts corresponding to data to be entered into the computer by the user.

18. A method as recited in claim 10, wherein the list of items comprises a list of prompts of words to be spoken by the user, and wherein handling of an item by the user comprises speaking one or more words corresponding to the prompt.

19. One or more computer-readable memories containing a computer program that is executable by a processor to perform the method recited in claim 10.

20. A method comprising:

displaying an identification of a plurality of users; and

for each of the plurality of users,

displaying a list of tasks to be performed by the user,

identifying one task in the list of tasks that is the current task that needs to be performed by the user, and

updating, in response to completion of the task by the user, the identification of the one task that is the current task that needs to be performed by the user to be the next task in the list of tasks.

21. A method as recited in claim 20, wherein displaying the list of tasks comprises displaying only a subset of the list of tasks to be performed by the user at any given time.

22. A method as recited in claim 21, further comprising scrolling through the list of tasks to display different subsets as tasks in the list are completed by the user.

23. A method as recited in claim 20, wherein the list of tasks comprises a list of actions to be taken by the user.

24. A method as recited in claim 20, wherein identifying one task that is the current task comprises displaying a geometric shape as a current location marker identifying the one task.

25. A method as recited in claim 20, wherein identifying one task that is the current task comprises displaying the one task differently than the other tasks in the list of tasks.

26. A method as recited in claim 20, further comprising:

receiving, for each of the plurality of users, an indication from each user's computer of the current task for that user.

27. One or more computer-readable memories containing a computer program that is executable by a processor to perform the method recited in claim 20.

28. A graphical user interface comprising:

a list portion identifying a list of a plurality of items to be handled by a user;

a user choices portion identifying information corresponding to a current item in the list; and

a current location marker that identifies one item of the list that is the current item to be handled by the user, wherein the current location marker is automatically updated to identify the next item in the list after the current item in the list has been handled by the user.

29. A graphical user interface as recited in claim 28, further comprising an applet window portion identifying information clarifying the information identified in the user choices portion.

30. A graphical user interface as recited in claim 29, wherein the user choices portion identifies information that is to be entered into a computer by the user, and wherein the applet window portion identifies information that has already been entered into the computer by the user.

31. A graphical user interface as recited in claim 28, wherein the list of a plurality of items comprises a list of words to be spoken by the user.

32. A graphical user interface as recited in claim 28, wherein the list of a plurality of items comprises a list of prompts of words to be spoken by the user, and wherein the user choices portion identifies, for each prompt, one or more words that can be spoken by the user to properly handle the prompt.

33. A graphical user interface as recited in claim 28, wherein the list portion further identifies information that has been entered by the user in handling previous items in the list.

34. A graphical user interface as recited in claim 28 implemented on a wearable computer.

35. A system comprising:

a display device;

a user interface component, coupled to the display device, causing a user interface to be displayed on the display device;

wherein the user interface includes a list portion in which a list of a plurality of items to be handled by a user are displayed;

wherein the user interface further includes a current location marker identifying one of the items in the list as the current item that needs to be handled by the user; and

wherein the user interface component further automatically updates the current location marker to identify a new item in the list in response to the user handling the current item in the list.

36. A system as recited in claim 35, wherein the user interface component further replaces, after the user has handled the current item, a user input in place of the current item.

37. A system as recited in claim 35, wherein the user interface includes only a subset of the list of the plurality of items at any given time.

38. A system as recited in claim 37, wherein the user interface component further scrolls through the list of items to display different subsets as items in the list are handled by the user.

39. A system as recited in claim 35, wherein the user interface component further displays, as part of the user interface, a current processing marker identifying an item in the list that is currently being processed by the system.

40. A system as recited in claim 35, wherein the list of a plurality of items comprises a list of a plurality of tasks to be completed by the user, and wherein handling of an item by the user comprises the user completing the task.

41. A system as recited in claim 40, wherein the list of tasks comprises a list of prompts corresponding to data to be entered into the system by the user.

42. A system as recited in claim 40, wherein the user interface component is implemented in software.

43. A method comprising:

displaying a list of tasks to be performed;

identifying one task in the list of tasks that is the current task needing to be performed;

receiving an input corresponding to the current task; and

updating, in response to receiving the input, the identification of the one task that is the current task to indicate that the next task in the list of tasks is the current task needing to be performed.

44. A method as recited in claim 43, wherein the displaying comprises displaying a list of tasks to be performed by a user.

45. A method as recited in claim 43, wherein the identifying comprises superimposing, on the display of the current task in the list, a set of one or more input options corresponding to the task.

46. A method as recited in claim 45, wherein the receiving comprises receiving, as the input corresponding to the current task, one of the input options from the set of one or more input options.

47. A method as recited in claim 43, wherein the receiving comprises receiving a user input.

48. A method as recited in claim 43, wherein the receiving comprises receiving an input from a computer component, wherein the input from the computer component indicates that the current task is completed.

49. A method as recited in claim 48, wherein the computer component comprises a processor executing a software program.

50. A method as recited in claim 48, wherein the computer component comprises a hardware component configured to carry out the current task.

51. A method as recited in claim 48, wherein the computer component comprises a remote computer.

52. A method as recited in claim 43, wherein displaying the list of tasks comprises displaying only a subset of the list of tasks at any given time.

53. A method as recited in claim 52, further comprising scrolling through the list of tasks to display different subsets as tasks in the list are performed by the user.

54. A method as recited in claim 43, further comprising displaying a current processing marker identifying a task in the list of tasks corresponding to a current input being processed by a computer performing the method.

55. One or more computer-readable memories containing a computer program that is executable by a processor to perform the method recited in claim 43.

56. A graphical user interface comprising:

a task list portion identifying a list of a plurality of tasks to be performed by a user; and

an indication in the task list portion of a current task to be performed, wherein the indication is changed, in response to the current task being performed, to indicate a next task in the list as the current task to be performed.

57. A graphical user interface as recited in claim 56, further comprising a user choices portion identifying information corresponding to the current task on the list to be performed.

58. A graphical user interface as recited in claim 56, further comprising:

a second task list portion identifying a list of a plurality of tasks to be performed by another user; and

an indication in the second task list portion of a current task to be performed by the other user, wherein the indication is changed, in response to the current task being performed by the other user, to indicate a next task in the list of tasks to be performed by the other use as the current task to be performed.

59. A system comprising:

means for displaying a list of items to be handled by a user in a particular order; and

means for identifying one item in the list of items that is the current item, for receiving a user input corresponding to the current item, and for updating, in response to receiving the user input, the identification of the one item that is the current item to indicate the next item in the list of items as the current item.

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