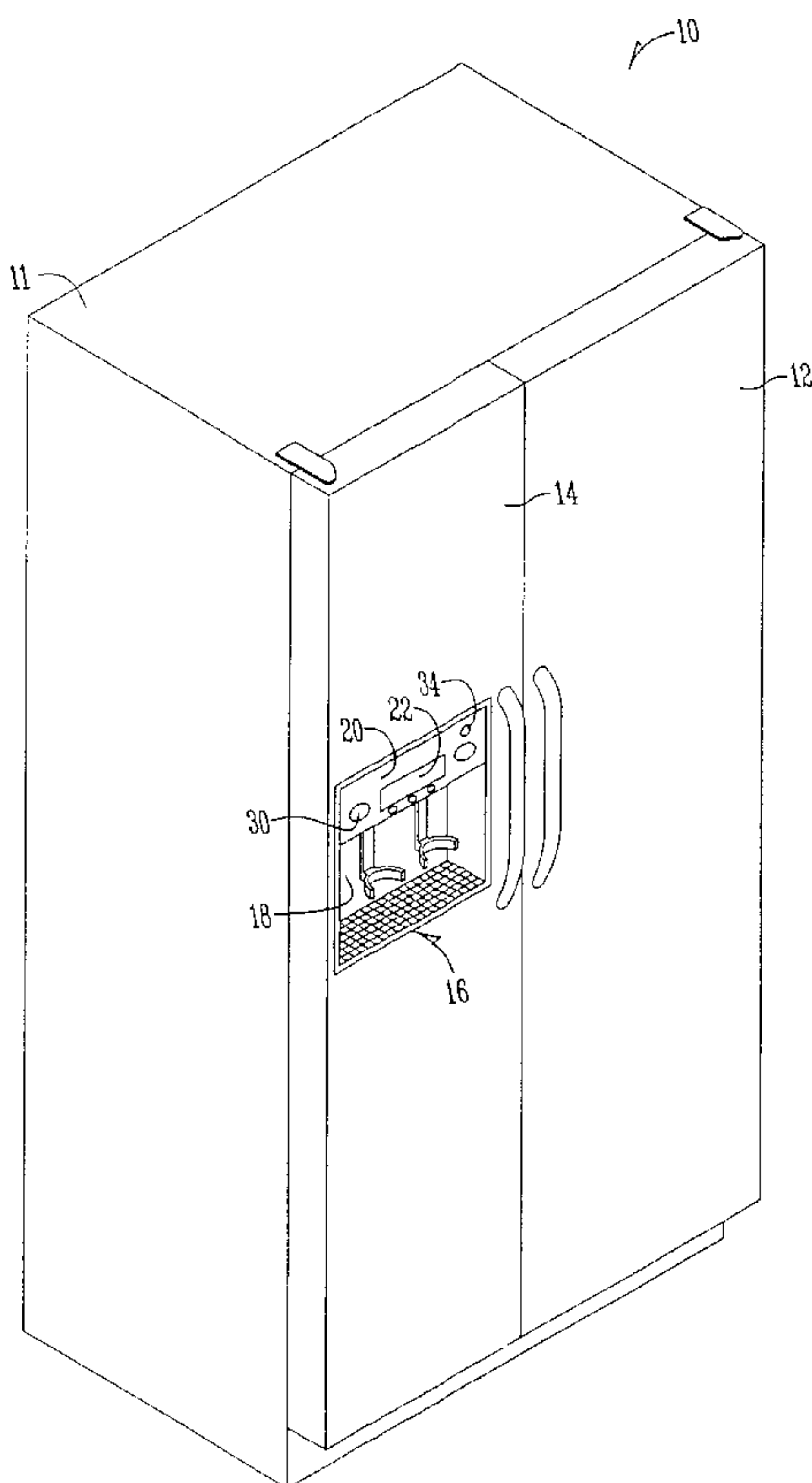




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(54) Titre : UNITE DE MESSAGERIE ELECTRONIQUE POUR REFRIGERATEUR  
 (54) Title: ELECTRONIC MESSAGE CENTER FOR A REFRIGERATOR



(57) **Abrégé/Abstract:**

A refrigerator (10) adapted for playing and recording voice messages is disclosed. The refrigerator (10) includes a cabinet (11) for enclosing a refrigerating compartment (13,15), the cabinet (11) having a door (14) for providing access to the refrigerating compartment (15), a message center (20) operatively connected to the cabinet(11). The message center includes a speaker, a microphone, and a display (22).

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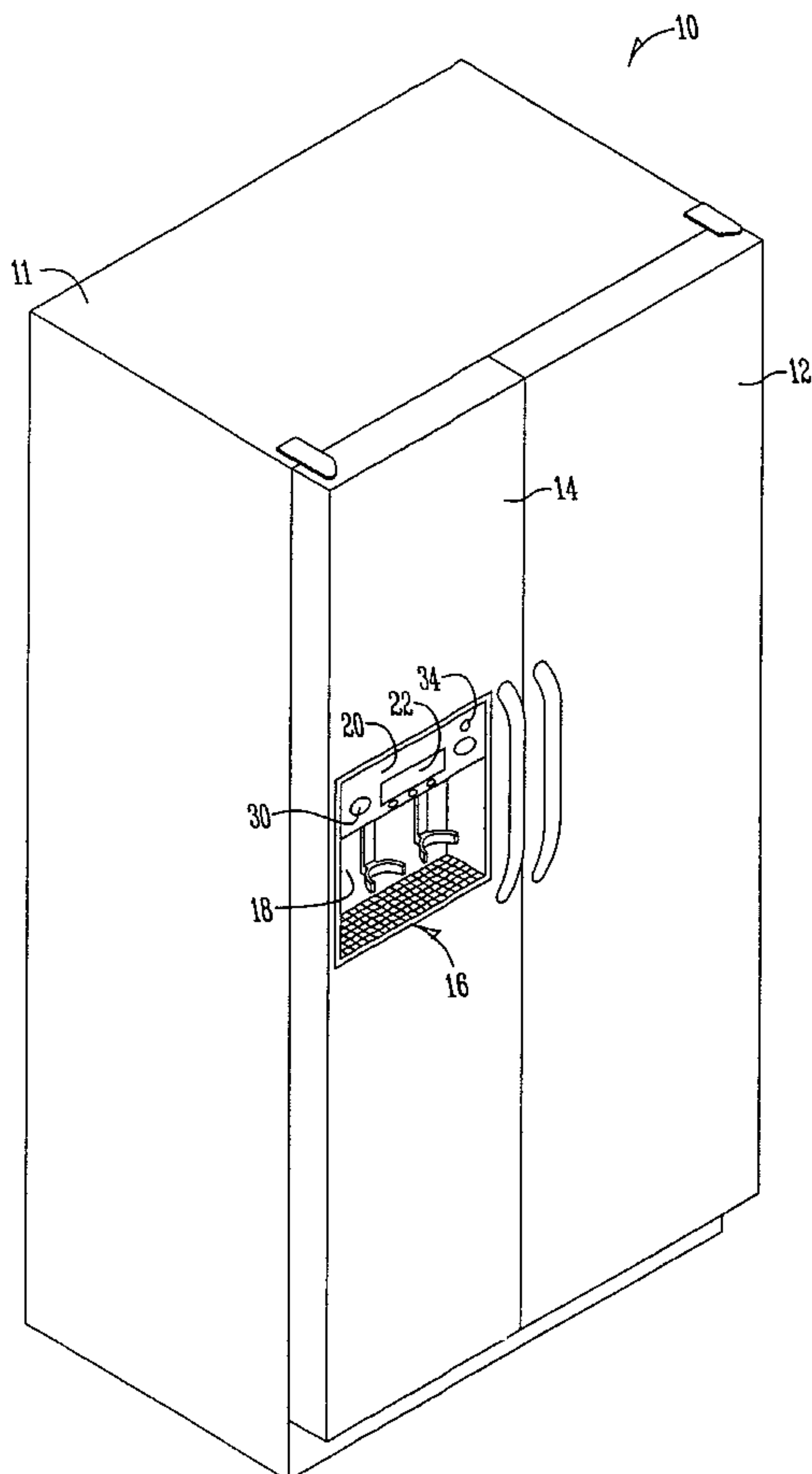
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(54) Title: ELECTRONIC MESSAGE CENTER FOR A REFRIGERATOR



(57) Abstract: A refrigerator (10) adapted for playing and recording voice messages is disclosed. The refrigerator (10) includes a cabinet (11) for enclosing a refrigerating compartment (13,15), the cabinet (11) having a door (14) for providing access to the refrigerating compartment (15), a message center (20) operatively connected to the cabinet(11). The message center includes a speaker, a microphone, and a display (22).

  
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TITLE: ELECTRONIC MESSAGE CENTER FOR A REFRIGERATOR

## BACKGROUND OF THE INVENTION

The present invention relates to refrigerators. More particularly, the present  
5 invention relates to refrigerators that are adapted to record and play back audio messages.

Refrigerators store food as their primary function. Yet, this is not the only role that  
refrigerators play in many installations. People often use refrigerators in other ways. For  
example, notes are sometimes stuck on the refrigerator using magnets or otherwise.  
Although a convenient location to place notes or reminders for one another, this can result  
10 in a cluttered appearance created by paper notes adhered to the refrigerator or stuck to the  
refrigerator by magnets.

Therefore, it is a primary object of the present invention to improve upon the state  
of the art.

It is a further object of the present invention to provide a refrigerator and a message  
15 center for a refrigerator that does not require the cluttered appearance created by paper  
notes adhered to the refrigerator or stuck to the refrigerator with magnets.

Another object of the present invention to provide a refrigerator with a message  
center that provides an indication if there are any messages.

It is a further object of the present invention to provide a refrigerator that is capable  
20 of recording and playing back audio messages.

These and/or other objects, features, and/or advantages of the present invention will  
be apparent from the following specification and claims.

## SUMMARY OF THE INVENTION

25 The present invention provides for an appliance, such as a refrigerator, adapted for  
playing and recording audio messages. According to one aspect of the invention, the  
refrigerator includes a cabinet for enclosing a refrigerating compartment, the cabinet  
having a door for providing access to the refrigerating compartment. The refrigerator also  
includes a user interface operatively connected to the cabinet. This interface includes a  
30 speaker, a microphone, and a display and is adapted for receiving and playing audio  
messages and to indicate the presence of new messages. Instead of communicating by

leaving notes that may or may not be seen, messages can be quickly recorded, stored and played back using the present invention.

According to another aspect of the invention, a display is used to display information about the voice messages. The same display can also be used for displaying refrigerator operation information. In addition, a message indicator can be used to indicate  
5 that one or more new messages are present. This alerts a user that they should check the messages.

#### BRIEF DESCRIPTION OF THE DRAWINGS

10 Figure 1 is a perspective view of one embodiment of a refrigerator of the present invention.

Figure 2 is a perspective view of the embodiment of Figure 1 showing the refrigerator with the doors open.

15 Figure 3 is a diagram of a user interface according to one embodiment of the present invention where the display illustrates water and ice dispensement refrigerator functions.

Figures 4, 5, and 6 are diagrams according to one embodiment of the present invention where the display shows message play back and record functions.

20 Figure 7 is a diagram of a user interface according to one embodiment of the present invention where the display illustrates air filter replacement information.

Figure 8 is a diagram of a user interface according to one embodiment of the present invention where the display illustrates water filter replacement information.

Figure 9 is a block diagram of the interrelated features and functions of the present invention.

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#### DETAILED DESCRIPTION OF THE DRAWINGS

Figure 1 provides a perspective view of a refrigerator 10 having a side by side configuration. The refrigerator 10 includes a housing or cabinet 11. There is a refrigeration compartment door 12 and a freezer compartment door 14 to provide access to  
30 the refrigerator and freezer compartments 13, 15 within the cabinet 11. The freezer compartment door 14 contains a water and ice dispenser, generally shown at 16. The

water and ice dispenser 16 include a lower receptacle 18 for receiving cups and dispensing water and ice. Above the receptacle 18 is an electronic message center 20. The message center 20 provides for storing and play back of audio messages. The message center 20 includes a display 22, one or more manual inputs such as button 30, and a message  
5 indicator 34 such as an LED.

Figure 2 illustrates the refrigerator 10 with an open refrigeration compartment door 12 and an open freezer compartment door 14. The open refrigeration compartment door 12 exposes the refrigeration compartment 13 within the cabinet 11. The open freezer door 14 exposes the freezer compartment 15 within the cabinet 11. Although it is preferable to  
10 place the message center 20 and receptacle 16 in the freezer compartment door 14, the present invention is not limited to any particular placement of either the water and ice dispenser 16 or the message center 20 or the various elements of the message center 20.

Figure 3 shows one view of the message center 20 and its accompanying user interface. The message center 20 includes a plurality of manual inputs, including buttons  
15 24, 26, and 28 as well as a menu button 30 and a message/play button 32. As shown in Figure 3, the display 22 is adapted for displaying refrigerator operation information. In particular, three icons are present. A first icon 36 is associated with dispensement of crushed ice. A second icon 38 is associated with dispensement of cubed ice. A third icon 40 is associated with dispensement of water. Each of the icons 36, 38, and 40 and its  
20 associated function is also associated with one of the buttons 24, 26, and 28, respectively such that pressing one of the buttons 24, 26, and 28, results in performing the associated refrigerator function. As shown, each of the icons 36, 38, and 40 also includes a textual label beneath it, "CRUSHED", "CUBED", and "WATER", respectively. The menu button 30 can be used to display any number of screens. Preferably, the use of the manual input  
25 buttons 24, 26, 28 is menu-driven so that the buttons allow for the selection of different functions based upon the currently displayed information on the display 22. Other display screens can provide for selecting a language in which to display information, setting date and time information, adjusting volume information, setting a timer, checking the status of a water filter, checking the status of an air filter, or other refrigerator functions.

30 A message indicator 34 such as an LED is also shown. The message indicator is used to indicate the presence or absence of unlistened to messages. Also shown in Figure 3

is textual message status information 42 that extends across the top of the icons 36, 38, and 40. The message status information 42 provides a message date stamp indicating the date that the latest message was left and indicates that there are "5 MESSAGES" that have been stored in the message center 20. Other message status information can also be stored  
5 and/or displayed. For example, the electronic message center 20 is preferably programmed to retain the following information associated with each recorded message: (1) the weekday and time of day the message was recorded; (2) whether or not the message has been listened to or played back; and (3) whether or not the message has been recorded during the current user session.

10 To begin a user session, a user presses the message button 32. This action takes the electronic message center 20 out of the default mode as shown in Figure 3 and into a messaging mode such as is shown in Figure 4. At the start of the user session, the message with the oldest date stamp that has not been heard is automatically selected and played back. If all the messages have already been heard, the oldest message is played. If there  
15 are no user messages then the message "no messages" is played. Pressing the message button 32 plays the currently selected message.

Figure 4 illustrates one embodiment of the display 22 for the instance where there are multiple (in this case 5) messages recorded and the user is provided with the opportunity to listen to the next message, erase the previous message or record a new  
20 message. The "RECORD" icon 44 indicates that when the button 24 is pressed (button 24 is located immediately below and therefore associated with icon 44), the message center 20 will be actuated to record a message by the user. The present invention is in no way limited to any particular audio message, but contemplates that such messages might include messages about meals, food in the refrigerator, or any other message. The "ERASE" icon  
25 46 indicates that pressing a center button 26 results in erasing a message. The "NEXT" icon 48 indicates that pressing the associated right hand button 28 will play the next message.

Figure 5 illustrates a screen display for the message center 20 that is displayed when a user is recording a message into the message center 20. There is a "PLAY" icon 50  
30 which indicates that pressing the lower button 28 will play a message. The "STOP" icon 54 indicates that pressing button 24, will stop the current message from being recorded.

The "ERASE" icon 46 will erase the message being recorded. The message indicator 34 will blink to indicate the presence of messages that have been recorded in the message center 20 but have not yet been played back.

Figure 6 depicts an embodiment of the user interface for the display 22 of the message center 20 which is normally displayed during play back of the previously recorded message. The "NEXT" icon 48 indicates that pressing the associated button 28 will advance the play back to the next recorded message. The volume icon 58 graphically indicates the current volume for play back while the directional icons 60 and 62 indicate that pressing the buttons 24, 26 will adjust the volume of the play back downwardly or upwardly as desired.

Figure 7 illustrates another embodiment of the display 22 of the message center 20 which is adapted to provide a user interface for air filter replacement. The display 22 includes air filter information 65. This information can include the remaining capacity of an air filter and/or an estimated replacement date. Thus, the display 22 provides for the display of refrigerator operation information in addition to message recording and playback information.

Figure 8 illustrates another embodiment of the display 22 of the message center 20 is adapted to provide a user interface for water filter replacement. The display 22 includes water filter information 65. This information can include the remaining capacity of a water filter, an estimated order date by which the water filter should be ordered in order to obtain it prior to an estimated replacement date, and/or the estimated replacement date. This is another example of how the display 22 provides for the display of refrigerator operation information in addition to message recording and playback information.

Figure 9 provides a block diagram illustrating structure of the present invention. The refrigerator 10 includes a control unit 66. The control unit 66 preferably includes an intelligent control such as a microcontroller or processor, however, the present invention contemplates that any type of control unit can be used as may be appropriate in a particular design. The control unit 66 is electrically connected to a display 22. The display 22 can be used to display either refrigerator operations or functions or message center functions or operations. Preferably, the display 22 is a LCD panel type display, however, the present invention contemplates that other types of displays may be used, such as may be



appropriate or desirable in a particular application. The control unit 66 is also electrically connected to manual inputs 68. The manual inputs 68 can include the buttons 24, 26, 28, 30, and 32 (as shown in Figures 3-8). The manual inputs 68 need not be separate buttons, but can be incorporated into a touch screen display, or otherwise provided. The control  
5 unit 66 can also be used to control refrigerator functions. The control unit 66 is electrically connected to the refrigeration system 76 such that the control unit 66 can control the dispensement of ice, the dispensement of water, or other refrigerator functions. In addition, the control unit 66 is electrically connected to a microphone 70 used to transduce voice or other sound information. The control unit 66 is also electrically connected to a speaker 72  
10 which is used to transduce sound information to play back audio messages. The control unit 66 is also electrically connected to a memory 74. The memory 74 is used to store one or more audio messages. The present invention contemplates that message playback, record , and memory functions can be implemented in the control unit through use of integrated circuits such as, but not limited to, those available from Integrated Storage  
15 Devices, Inc. (ISD).

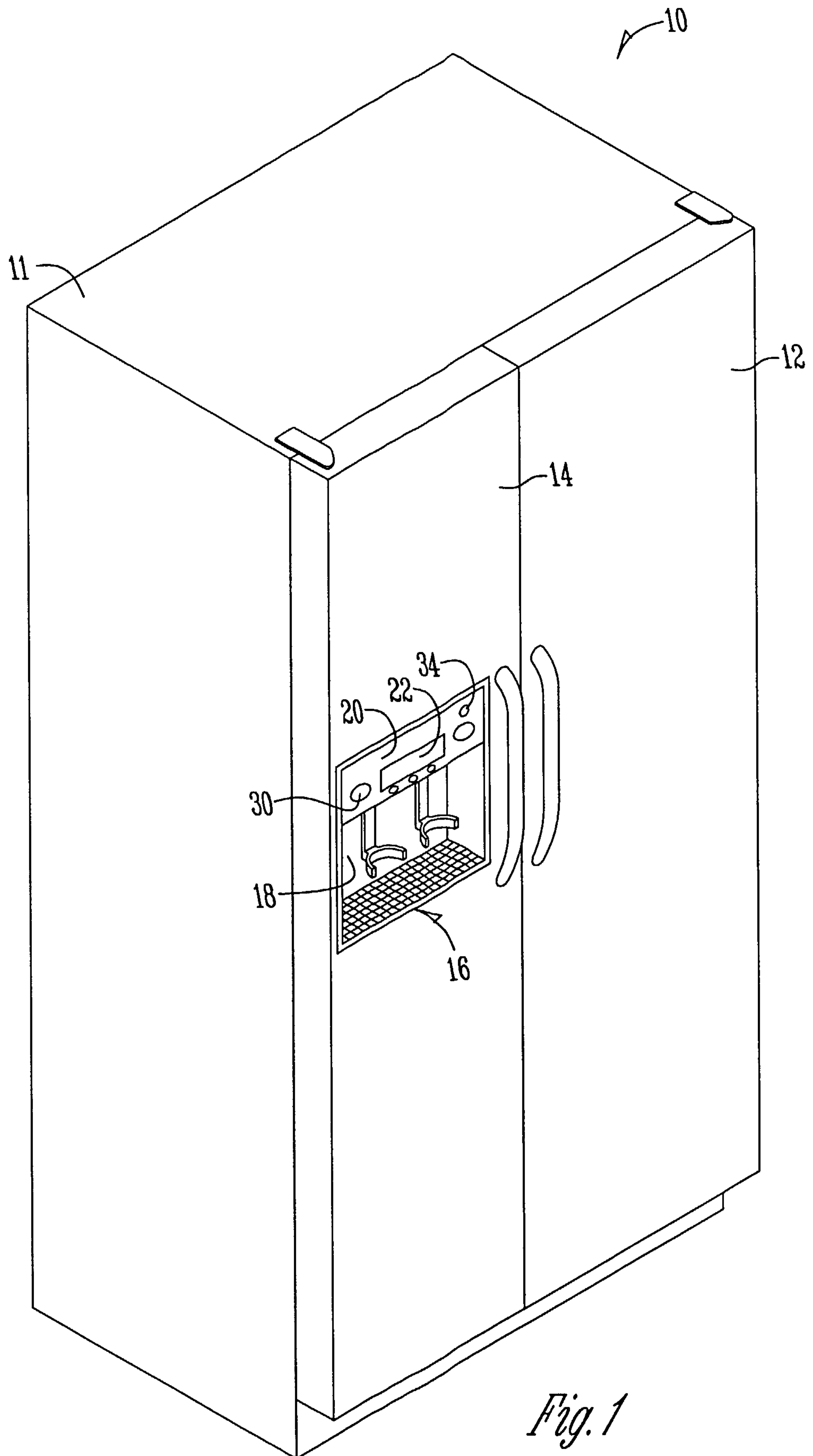
Thus, an electronic message center for a refrigerator has been disclosed. The present invention contemplates variations including the type of display, the type of refrigerator functions performed, the placement of the display, the number and placement of manual inputs, the type of and placement of a message indicator, and other variations  
20 within the spirit and scope of the invention. Also, the message center can be incorporated into other appliances and be used in conjunction with the functions of a particular appliance.

1. A refrigerator (10) adapted for playing and recording voice messages comprising: a cabinet (11) enclosing a refrigerating compartment (13), the cabinet having a door (12) for providing access to the refrigeration compartment; a message center (20) built into the cabinet and comprising a control unit (66), a refrigeration system (76) operatively connected to the refrigerating compartment for performing a plurality of refrigeration functions, a display (22) for displaying message information and refrigerator operation information, a speaker (72), a microphone (70), a memory (74) and a manual input system (24,26,28,30, and 32); the control unit being electrically connected to the refrigeration system, the display, the speaker, the microphone, the memory and the manual input system; the control unit responding to manual manipulation of the manual input system to record in the memory a voice message spoken into the speaker; the control unit responding to manual manipulation of the manual input system to play on the speaker an audio reproduction of the voice message recorded in the memory; the control unit responding to manual manipulation of the manual input system to cause the refrigeration system to perform one or more of the plurality of refrigeration functions; and the control unit responding to manual manipulation of the manual input system to cause a plurality of separate groups of indicia to be displayed on the display.

2. The refrigerator claimed in claim 1 and further comprising the control unit is responsive to manual manipulation of the manual input system to record a plurality of separate messages in memory, and further wherein the control unit plays the separate messages stored in memory one at a time on the speaker in response to manual manipulation of the manual input system.

3. The refrigerator claimed in claim 1 and further comprising a message indicator (34) on the message center electrically connected to the control unit to change from a first visual signal when one or more messages are stored in the memory to a second visual signal when no messages are stored in the memory.

4. The refrigerator claimed in claim 1 wherein the control unit is responsive to manipulation of the manual input system to cause the display to create a visual display of the number of messages stored in memory.
5. The refrigerator claimed in claim 1 wherein the manual input system includes a plurality of input buttons.
6. The refrigerator claimed in claim 4 wherein the control unit is convertible between a default mode and a message mode in response to manual manipulation of one of the buttons and displays the different groups of indicia on the display when in the default mode and the message mode.
7. The refrigerator claimed in claim 6 wherein at least one of the plurality of buttons causes the control system to perform the recording of the message while the control unit is in a first one of the plurality of modes, and the one button causes the control unit to perform the playing of the message while the control unit is in a second one of the plurality of modes.
8. The refrigerator claimed in claim 7 wherein the one button causes the control unit to cause the refrigeration system to perform a first function of the plurality of functions while the control system is in the default mode.
9. The refrigerator claimed in claim 1 wherein the control unit causes the display to display indicia relating to the audio message stored within the memory.



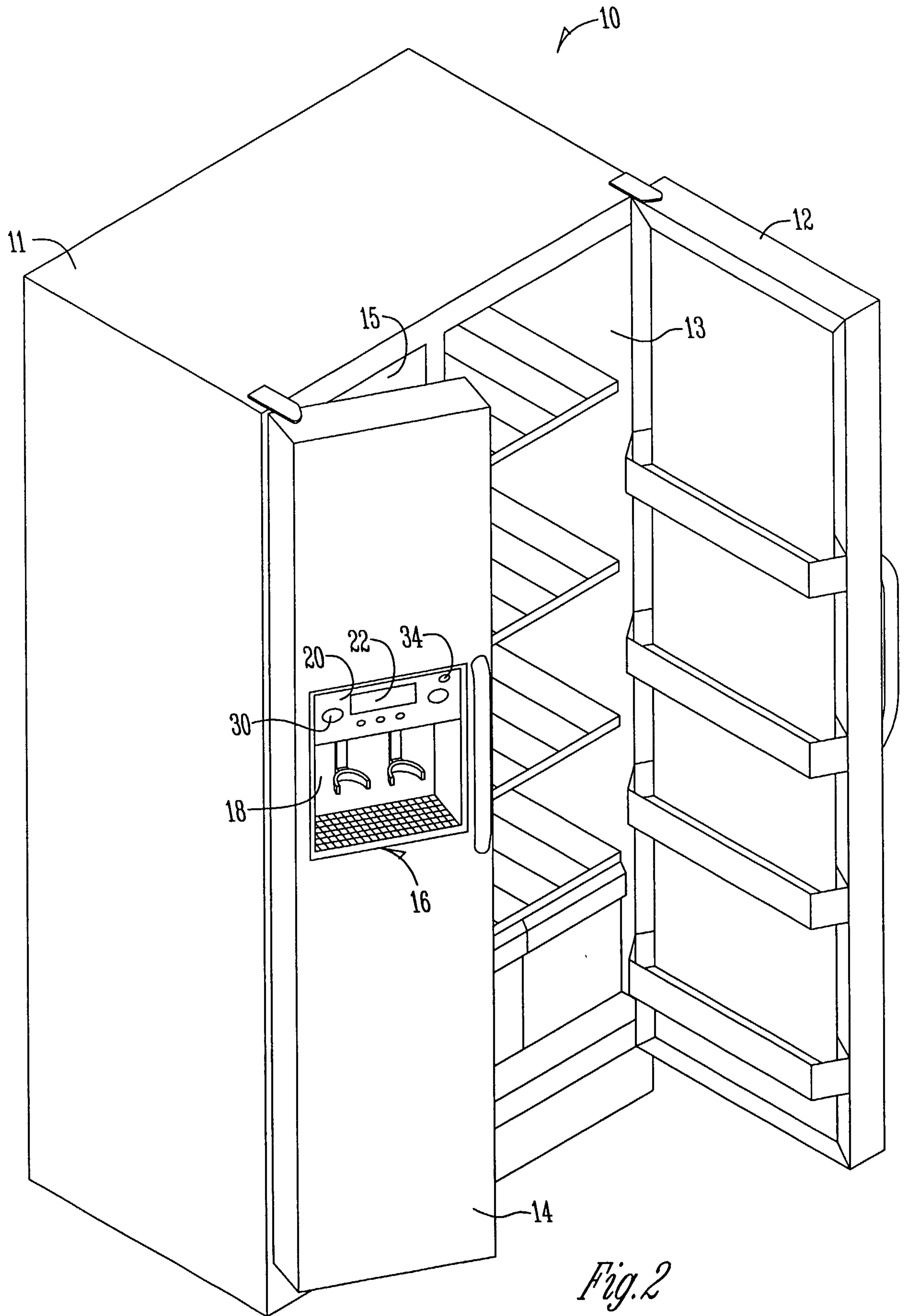


Fig. 2

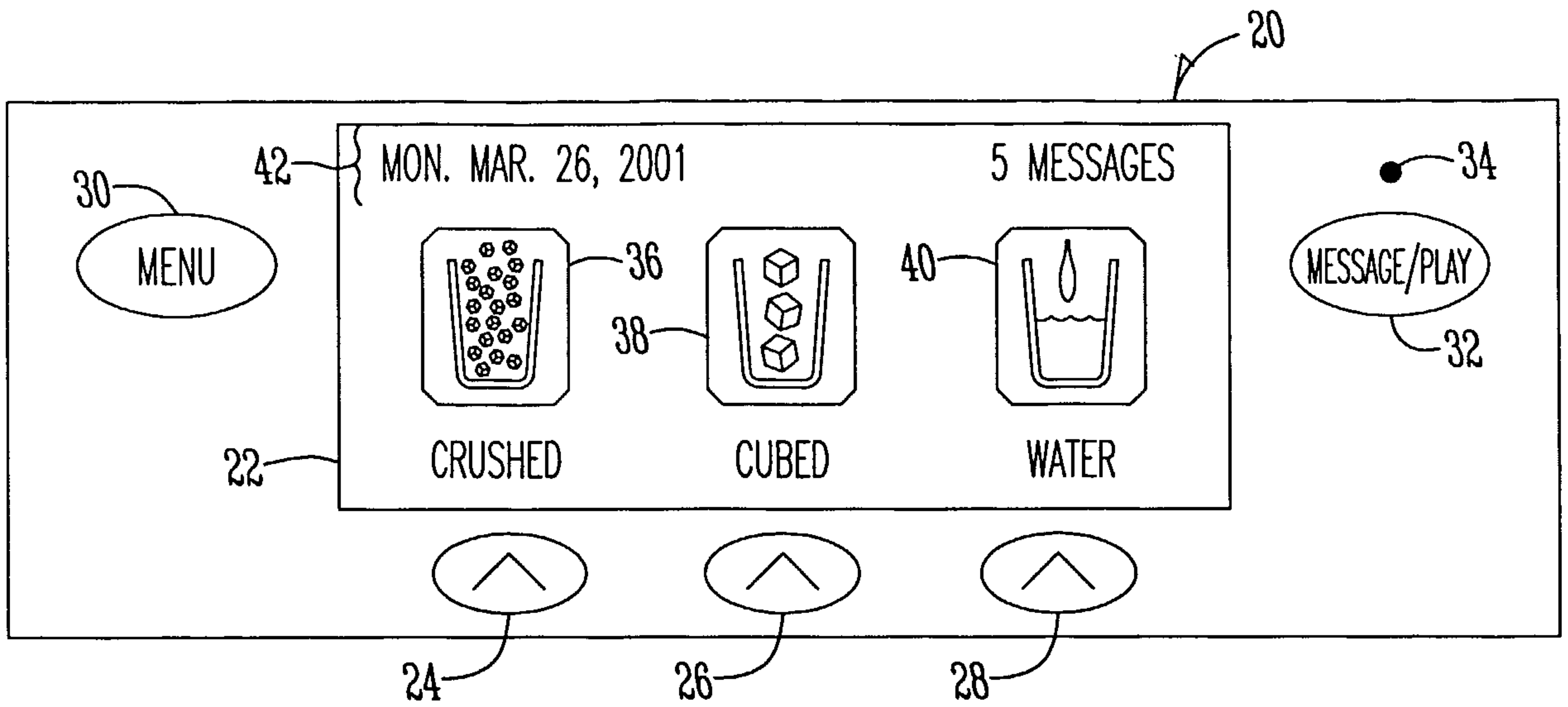


Fig. 3

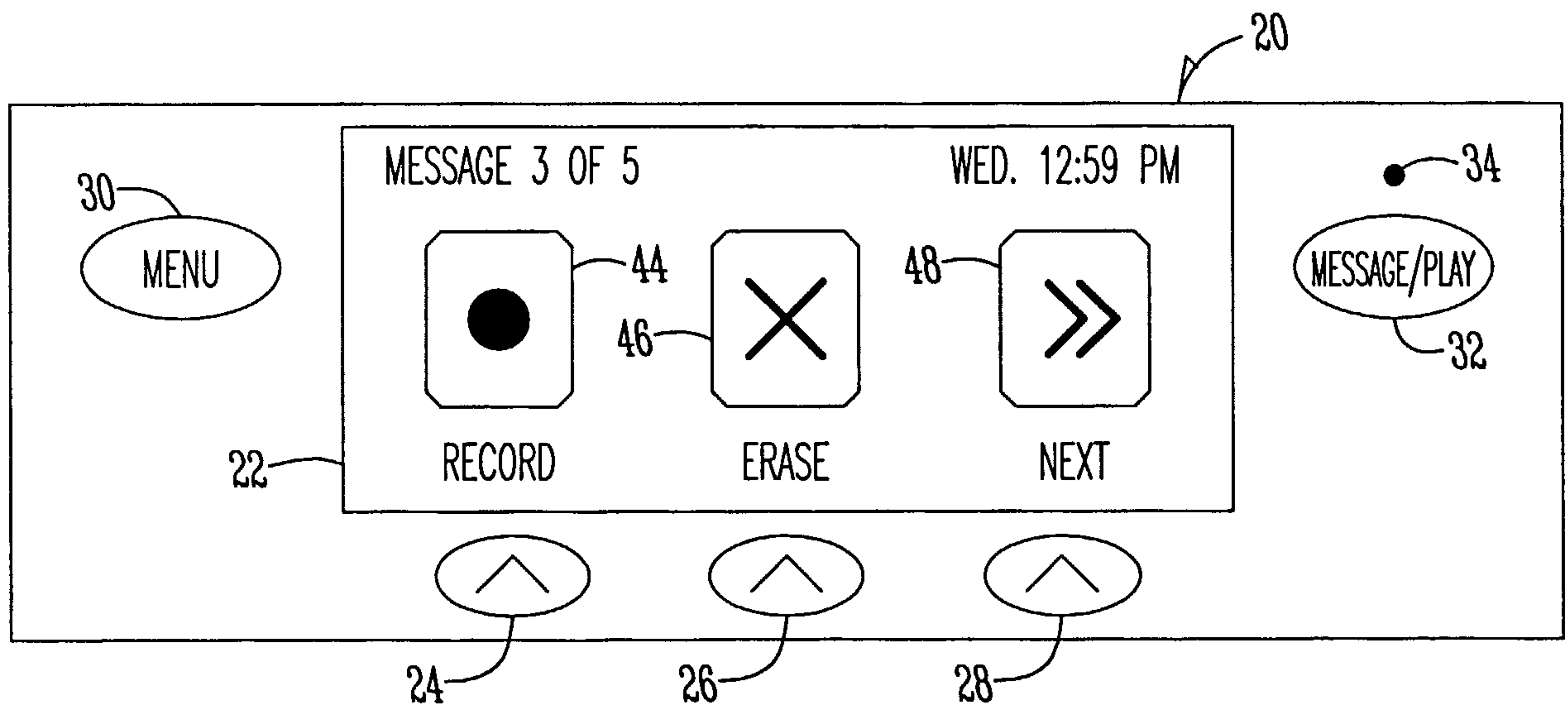


Fig. 4

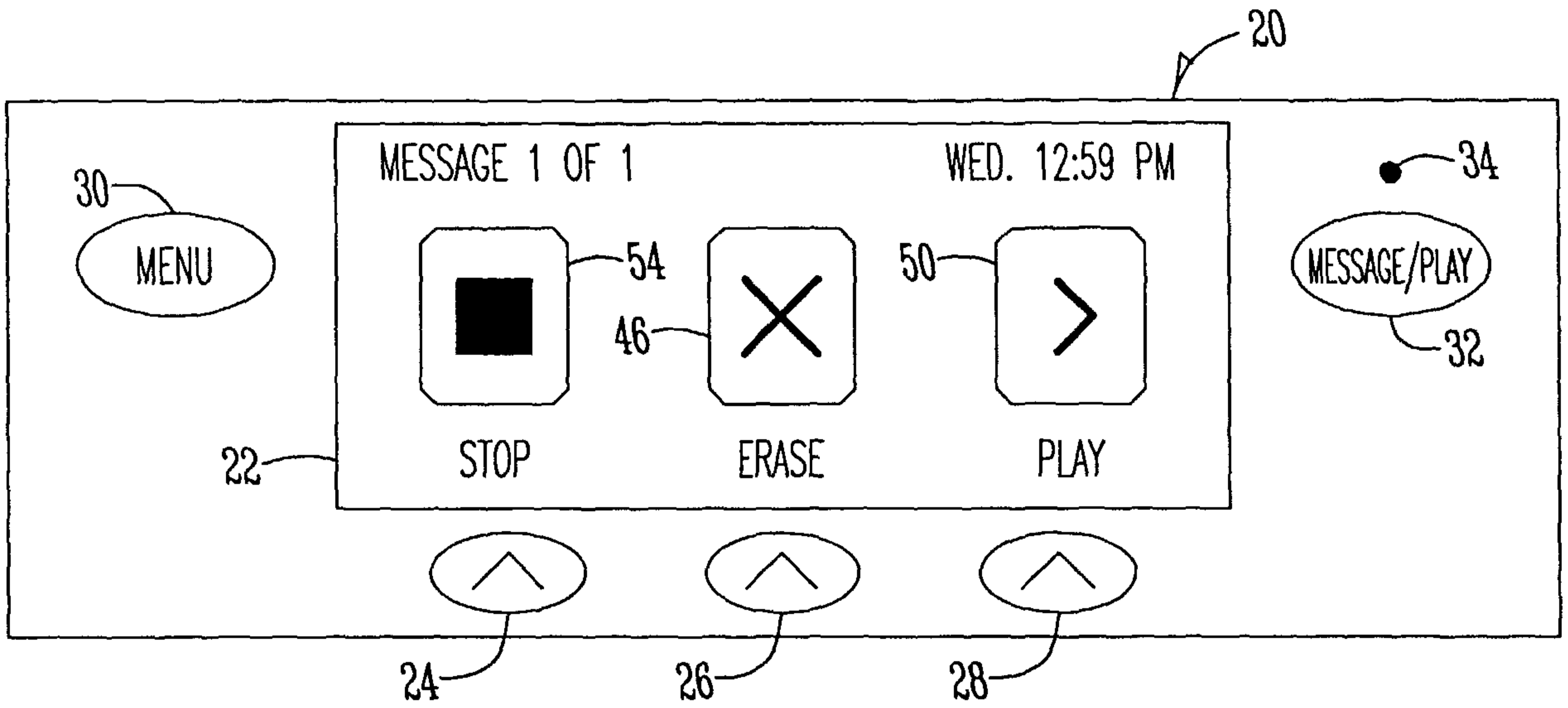


Fig. 5

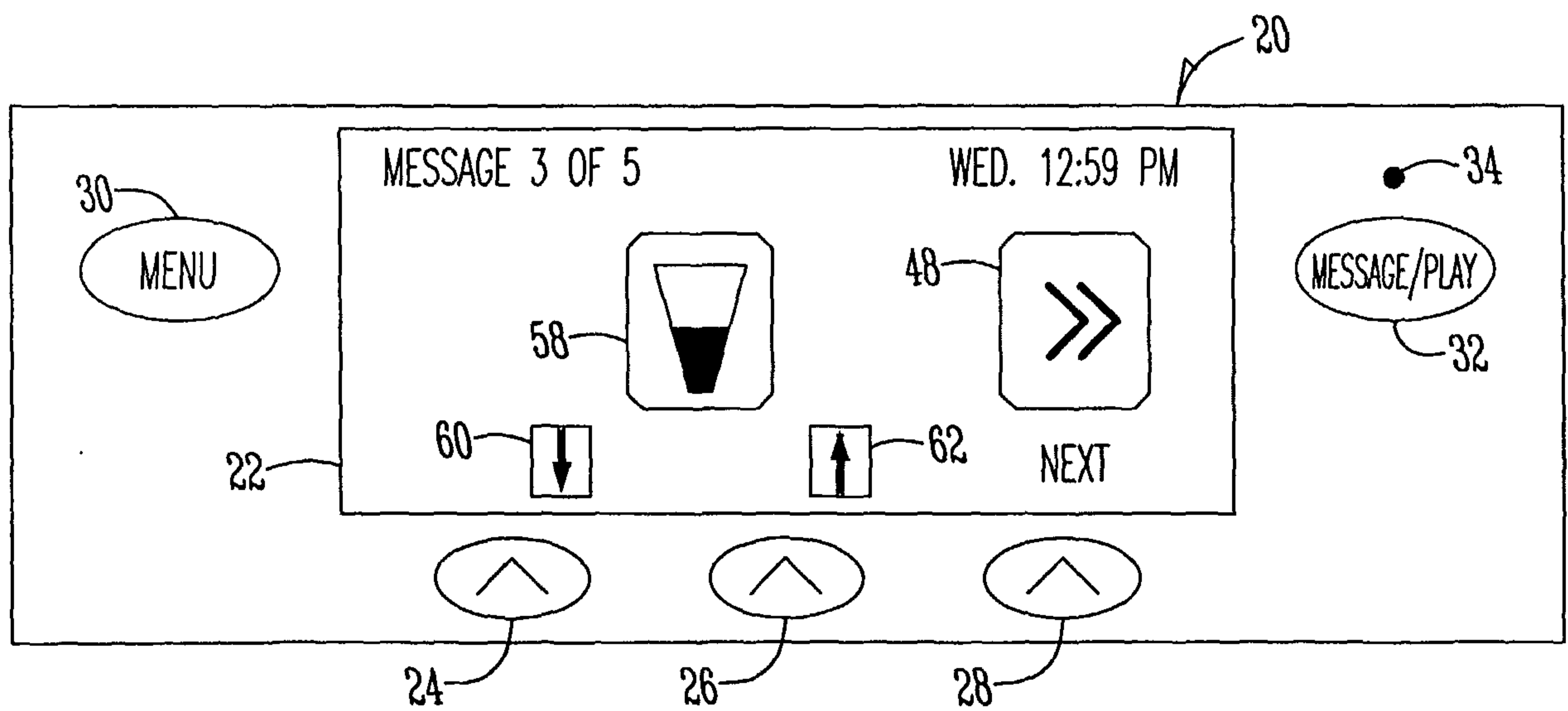


Fig. 6

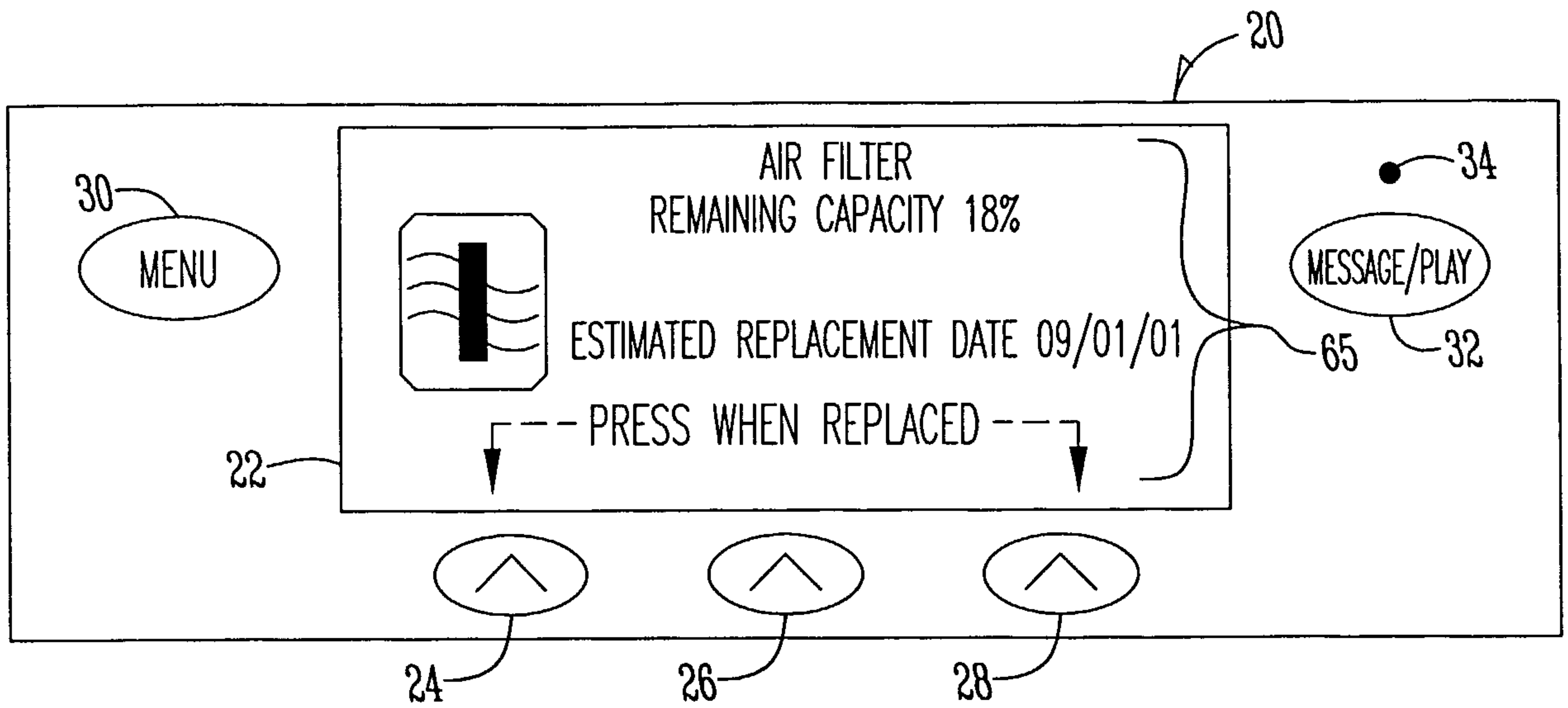


Fig. 7

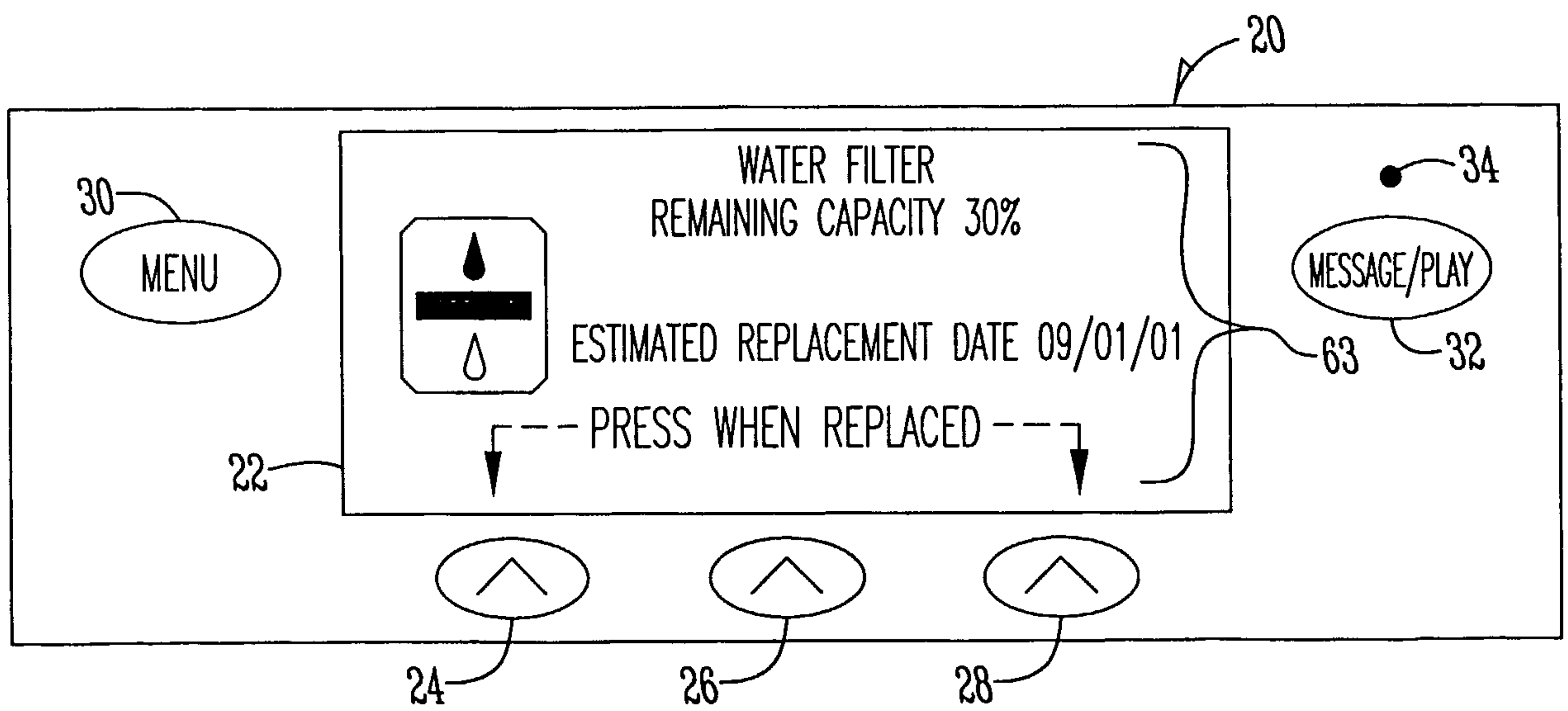


Fig. 8



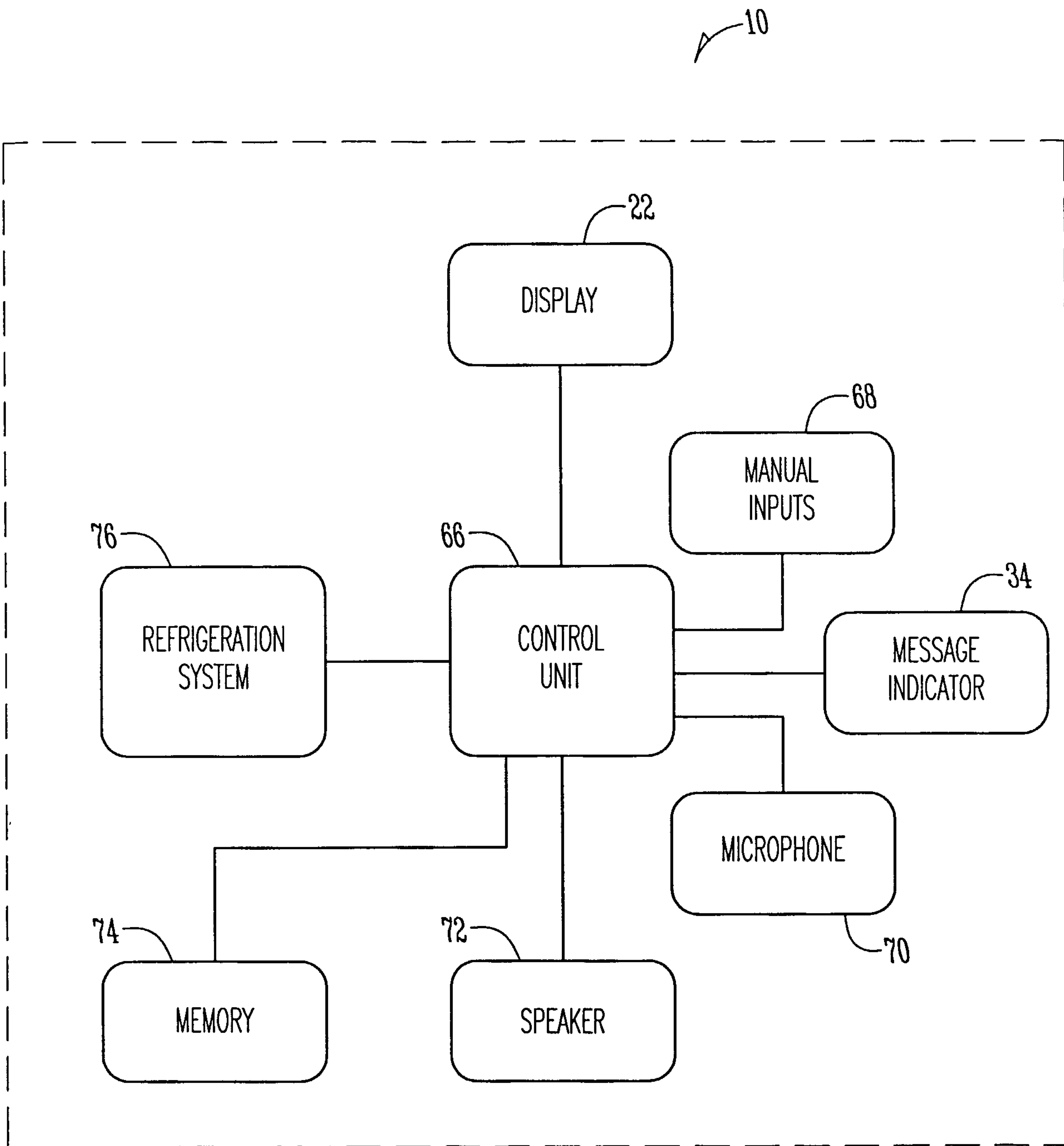


Fig. 9

