APPENDIX 1

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APPLICANTS

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ADDRESS

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TITLE

GEOGRAPHIC - TEMPORAL SIGNIFICANT MESSAGING

U.S. DEPT. OF COMM./ PAT. & TM—PTO-436L (Rev.12-94)

PARTS OF APPLICATION FILED SEPARATELY

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Jean B. Jeanglaude
Assistant Examiner

CLAIMS ALLOWED

Total Claims	Print Claim
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DRAWING

Sheets Drwg.	Figs. Drwg.	Print Fig.
3	4	4

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ISSUE TICKLE

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PATENT APPLICATION SERIAL NO. 08/822024

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PATENT APPLICATION TRANSMITTAL LETTER	DOCKET NO. PF01297NA

Box: Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Transmitted herewith for filing is the patent application of: **Alain Charles Louis Briancon, Terence Edward Sumner,**

For: **GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING**

Enclosed are:

(1) Transmittal Letter to PTO;
(2). **3** sheet(s) of drawings and **20**page(s) of specification;
(3) A Declaration and Power of Attorney;
(4) Assignment Document with PTO 1595 Assignment Transmittal;
(5) Information Disclosure Statement;
(6) PTO 1449 with references; and
(8) Return postcard.

CLAIMS AS FILED

FOR	NUMBER FILED	NUMBER EXTRA	RATE	FEE
TOTAL CLAIMS	21-20	1	X $22.00	22.00
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICANTS:	**Briancon, et al.**	EXAMINER:	**Jeanglaude, J.**
SERIAL NO.:	**08/822,024**	GROUP:	**2735**
FILED:	**March 24, 1997**		
ENTITLED:	**GOEGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING**		

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Respectfully submitted,
Briancon, et al.

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08/822024

GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING

Field of the Invention

This invention relates in general to selective call messaging devices and more specifically to messaging devices that process messages logically for a user in the context of space and time.

Background of the Invention

Information services can be temporal as well as spatial in nature. Sending information about highway traffic for example is relevant to a pager user only if the user is in or near the market where the traffic problem exists and if the message is read within several hours of the report of the traffic problem. For instance, if the pager receives the message "635 backed up to stadium" while in Dallas and then the user arrives in Denver, the user reading this information would not obtain any value from this message. Likewise, if the user receives the same message, but reads the message 5 hours later, the message would be of little value and occupy memory space that could be used for other more pertinent messages. A pager that accounts for the temporal nature of messages is described in U.S. Patent No. 5,225,826, assigned to Motorola, Inc. and entitled "Variable Status Receiver", this patent hereby incorporated by reference. Thus, a need exists for an intelligent messaging device that is able to distinguish messages that are solely spatially sensitive or both time and space sensitive and that further logically processes such messages in accordance with the actions of the user.

Summary of the Invention

In a first aspect of the present invention, a method processing spatially sensitive information at a selective call receiver comprises the steps of receiving the spatially sensitive information along with an associated identifier and storing the spatially sensitive information if the associated identifier is valid. When a change is detected in the associated identifier as the selective call receiver roams from a first area to a second area, the selective call receiver process the spatially sensitive information.

In a second aspect of the present invention, a messaging device for receiving a plurality of messages with a portion of the messages having a relevancy status comprises a selective call receiver for receiving the plurality of messages, the relevancy status for the portion of the plurality of messages, and updates to the relevancy status, a memory for storing at least a portion of the plurality of messages and the updates to the relevancy status, and a processor for processing the portion of the plurality of messages that have received updates to the relevancy status.

In a third aspect of the present invention, a messaging device for receiving a plurality of messages having at least a portion with a location identifier comprises a selective call receiver for receiving the plurality of messages, the location identifier for the portion of the plurality of messages, and updates to the location identifier, a first memory location for storing a list of existing location identifiers, a second memory location for storing at least a portion of the plurality of messages, the location identifier for the portion of the plurality of messages, and the updates to the location identifiers, and a processor for processing the portion of the plurality of messages that have a location identifier by comparing the first memory location with the second memory location.

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Brief Description of the Drawings

FIG. 1 is a block diagram of a messaging device in accordance with the present invention.

FIG. 2 is a flow chart of an algorithm illustrating a method in accordance with the present invention.

FIG. 3 is a representation of locations used in system in accordance with the present invention.

FIG. 4 is another flow chart of an algorithm illustrating a method in accordance with the present invention.

Detailed Description

A messaging device for receiving a plurality of messages wherein at least a portion of the plurality of messages have a relevancy status comprises a selective call receiver for receiving the plurality of messages with the relevancy status as well as updates to the relevancy status. The messaging device further preferably comprises a memory for storing at least a portion of the plurality of messages and the updates to the relevancy status and a processor for processing the portion of the plurality of messages that have received updates to the relevancy status. Preferably the relevancy status is a location identifier or a valid time period indicator or a combination of location and time indicators. The location identifier is preferably selected from the group consisting of Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter colorcode or prohibited location indicator. Some of these identifiers will be used with Motorola's FLEX™ or ReFLEX™ roaming paging protocol. The relevancy status can make up a portion of a receiver's address or can be another part of the message received. In any event, the messaging device must be able to determine its location either

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explicitly (as with location identifiers) or implicity as can be contemplated within the scope of the present invention. (For example, if only a particular frequency or modulation scheme is used in a particular area, then the location of the received signal can be implicitly determined.) With respect to time and the processing of time-based decisions, the messaging device may have the ability to derive time from the over-the-air protocol it receives (again, such as Motorola's synchronized FLEX™ or ReFLEX™ protocols), but alternatively the messaging device may also derive time from a real time clock. Further, it is contemplated within the present invention that the messaging device can be a one-way or a two-way selective call receiver.

In accordance with the present invention and with reference to FIG. 1, a messaging device for receiving a plurality of messages that have a location identifier in at least a portion of the messages comprises a selective call receiver for receiving the plurality of messages as well as updates to the location identifiers. The messaging device further comprises a first memory location used for storing a list of existing location identifiers and a second memory location used for storing at least a portion of the plurality of messages, the associated location identifier for the portion of the plurality of messages, and the updates to the location identifiers. The messaging device further comprises a processor for processing the portion of the plurality of messages that have a location identifier by comparing the first memory location with the second memory location. Preferably the messaging device is a one-way selective call receiver or a two-way selective call transceiver and the processor stores a message and enables the display of the message if a match is found between the existing location identifiers and the location identifier associated with the message. Alternatively, if desired, the messaging device may be programmed to find prohibited location indicators. In such a case, a processor does not store (or does not display or does not display portions as desired of) a message if a match is found between the existing location identifiers and the location identifier

associated with the message. In another embodiment, the messaging device's processor can delete an existing message from the second memory if a match is found between the existing location identifiers and the location identifier associated with the message.

Again, FIG. 1 illustrates a selective call receiver 10 or alternatively a transceiver (with receiver 22 and transmitter 21) operatively constructed in accordance with the present invention. This receiver or transceiver is preferably associated with a paging system having a base station transmitter and terminal. The receiver responds to control data information from the base station terminal and in turn stores and provides data messages to a user during operation.

Radio frequency modulated selective call paging signals are received at antenna 20, demodulated by receiver 22 and decoded by decoder 24. Alternatively, the transceiver can further encode messages and/or control signals via encoder 23 and transmit messages or control signals via the transmitter 21 and antenna 20. Decoder 24 compares address signals within the selective call signal with at least one predetermined address signal stored within the code plug 26. In response to detecting an address assigned to the pager, a message signal following the address is processed. Status decoder 28 determines if the message signal includes status and timing information and stores the information in a status area 32 within message memory 30. If no initial status information is included, a default status is assigned to the message. The status decoder 28 may additionally make a decision on whether a message should be stored at all. Thus, the decoder 24 can decode a valid or target address, yet the status decoder 28 can still find an invalid status (such as invalid time or an invalid location) and direct the messaging device to not store the message (or alternatively store and not display the message). If the address and status is valid, then the message information is stored in a message area 34 within message memory where each message has a corresponding status signal. The pager also has a display 36 for displaying message information as well as time of

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day information as determined by a time of day clock 38. Alternatively, a pager using Motorola's FLEX™ family of paging protocols can derive the time from the synchronized frame information inherently available from over the air messaging using the protocol itself and store the time information where appropriate. The time of day clock 38 may also provide day and date information and is capable of generating alarms in response to the time of day being equal to a time set by various functions of the pager. The status of messages stored in message memory may be changed by a characteristic analyzer and status controller 40 in response to the time of day clock 38 or in response to geographic information received in memory 30 or in response to a combination of the time and geographic information. Additionally, the status of a message stored in message memory can be changed under manual control from manual inputs 42 which may include a plurality of buttons for manually operating various functions of the pager. The device 40 is preferably a memory location containing at least an algorithm similar to the one outlined in FIG. 2 as will be described. Decoder 24 further analyzes the status assigned to a received message and the status of messages stored in the message memory 30 and determines which messages if any are to be deleted in order to store the message, or if the received message will be stored. It should also be understood that it is within contemplation of the present invention to have location and other identifiers determined by any source, not just from the same channels that provide the messaging information. Thus, if the device 10 further provided a means for a GPS received signal, such information could be used to provide processing of messages within context of location.

Referring to FIG. 2, an algorithm 50 in accordance with the present invention is shown. A selective call receiver or transceiver receives a new message and decodes or reads the new message at step 52. With particular reference to paging, receipt of messages are typically treated differently dependent upon whether a message is a personal message or an information services message. More likely than not, information

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services messages will only have a particular relevancy during a given period or for a particular geographic location. The present invention certainly contemplates that personal messages would be within the scope of the claimed invention, but information services messages are merely used here as a clear example. Thus, at step 54, the selective call receiver may detect if the message is an information services message. If not, the message can be treated as a personal message at step 56. If the message is an information services message, then the algorithm may determine if the message is a repeat message at step 58. If the message is a repeat message, then an inquiry is made to see if the original message was received without errors at step 60. If no errors existed in the original message, then the new message is not saved as shown in step 62. If errors existed in the original message at step 60, then several options could be implemented. A first option could include error correcting the original message with information from the repeat message. Another option could include storing the new message if the new message has less errors than the original message. Further, the original message could be deleted, particularly if no further repeats were expected. If the message is not a repeat message, then it is determined if the message is location sensitive at step 66. If the message is not location sensitive at step 66, then it is determined if the message is time sensitive at step 68. If the message is not time sensitive, then the message is stored at step 70. If the message is time sensitive, then it is determined if the message received exists within a valid time period at step 72. If the time appears valid, then the message is stored at step 70. If the time is invalid, then the message is not stored as shown at step 74. Alternatively (not shown), the message could be stored, but not displayed. In another alternative, the message is stored and only portions (that were considered valid) of the message is displayed.

If the message is location sensitive at step 66, then a match for a location identifier is sought at step 76. Alternatively, a subzone or sub-location match may be sought as well as shown in step 78. The location

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identifier and sub-locations can come in many variants including Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter colorcode as well as prohibited location indicator to name a few. If no location match is indicated, then the message will not be stored at step 74. If a location match is indicated, then an inquiry into time validity is done at step 68 as previously described above.

Operationally, a method 80 (with reference to FIG. 4) of processing spatially sensitive information at a selective call receiver in accordance with the present invention preferably comprises the steps of receiving (82) the spatially sensitive information along with an associated identifier and storing (88) the spatially sensitive information if the associated identifier is valid. If at decision block 84, it is determined that the identifier is invalid, then the message is not stored (86). Then, the method continues by detecting a change in the associated identifier at decision block 90 as the selective call receiver roams from a first area to a second area. If a change is detected, then, the spatially sensitive information is processed at step 92. Preferably, such processing includes deleting at least a portion of the spatially sensitive information which is not relevant to the second area. Alternatively, processing of such messages could include storing a message and deleting such message until a later time when the memory management scheme of the pager determines that the message should be deleted. A memory management scheme could include automatically deleting at least portions of the spatially sensitive information when the memory of the selective call receiver is filled beyond a threshold level and otherwise deleting such portions of the spatially sensitive information when the user prompts the selective call receiver to display a message or delete messages or portions thereof upon other events at the messaging device as could be reasonably contemplated. In another alternative, the selective call

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receiver could delete at least portions of the spatially sensitive information when a user prompts the selective call receiver to display at least portions of the spatially sensitive information.

In another embodiment, a method of processing a message among a plurality of messages received over the air at a selective call receiver comprises the steps of receiving the plurality of messages wherein at least a portion of the messages have a relevancy status that includes a space/time indicator. The messages are stored if the relevancy status matches a stored relevancy status at the selective call receiver. When the space/time indicator changes, the method then tags the messages for processing and then the tagged messages are processed. Such change in the space/time indicator can be a change in location or a change in time beyond a predefined threshold period. Such processing could include the step of deleting messages that have an invalid space/time indicator.

Ten messages are provided below in a table as an example of how a selective call receiver might operate in accordance with an embodiment of the present invention. Each message in the table provides one or more bits of status information: Address (whether personal or information services); location identifiers, sub-location identifiers, time (either derived from the protocol or a real time clock); a spatial or time sensitive message or a message that is both time and space sensitive; and a stale time indicator. The target location identifier and the target sub-location identifier could be location identifiers already stored in memory (such as a look-up table) in the messaging device. The process column describes what process the messaging device performs based on the relevancy status received.

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	ADDR	LOC ID	SUB LOC ID	TIME	MESSAGE	TARGET LOC. ID	TARGET SUB LOC ID	STALE TIME	PROCESS
1	INFO	A	A1	1PM	10% off by showing pager before closing	A	A1	5PM	STORE/ ALERT
2	INFO	A	A1	10AM	sales force meeting @noon	A	A2	12:30	STORE/ ALERT
3	INFO	A	A1	10AM	sales force meeting @noon	B	B5	12:30	NO STORE/ NO ALERT
4	INFO	A	A1	10AM	sales force meeting @noon	A	A1	12:30	STORE/ ALERT 5 MINS B/F MEETING
5	INFO	A	A1	1PM	sales force meeting @noon	A	A1	12:30	DELETE OLD PAGE
6	INFO	NYC	NYC1	3AM 7/4/99	Avoid NYC, Riot 48hr curfew	NYC	NYC1	3AM 7/6/99	STORE/ ALERT
7	INFO	NYC	NYC3	3AM 7/4/99	Avoid NYC, Riot 48hr curfew	NYC	NYC1	3AM 7/6/99	STORE/ ALERT
8	INFO	MEX	MEX9	7AM 7/4/99	Avoid NYC, Riot 48hr curfew	NYC	NYC1	3AM 7/6/99	DO NOT DISPLAY & DELETE
9	OVERRIDE 1	MEX	MEX9	3AM 7/4/99	Avoid NYC, Riot 48hr curfew	NYC	NYC1	3AM 7/6/99	STORE/ AUTO DISPLAY
10	OVERRIDE 2	MEX	MEX9	3AM 7/4/99	Avoid NYC, Riot 48hr curfew	NYC	NYC1	3AM 7/6/99	STORE/ NO AUTO DISPLAY

In message 1, the location and sub-location identifiers match and the message received is during a valid time period, therefore the message is stored and the user is alerted. Message 1 represents an example of a message that a retail store could send to encourage customers to buy within a certain time period. In message 2, the sub-location does not match, but the messaging device can still be programmed to store and alert the user, particularly if the sub-location identifier appears to be adjacent to the target sub-location identifier. In message 3, the location identifiers do not match and therefore the message is preferably not stored. In message 4, the location identifiers match and the time is valid, but the pager is alternatively programmed to store the message and alert the user 5 minutes before the pertinent time as derived from the message. In this case, a meeting at 12am is indicated and the user would be alerted at 11:55am. In message 5, the time period is invalid. Thus, the pager could either delete the new message or alternatively (if the new message is a repeat) the old page could be deleted.

Message 6 has matching location and sub-location identifiers and is received during a valid time period. Thus, the message would be stored and the user alerted. Message 7, as shown in message 2, fails to show a matching sub-location identifier, but the messaging device can still be programmed to store and alert the user, particularly if the sub-location identifier appears to be adjacent to the target sub-location identifier. Message 8, as shown in message 3 fails to show matching location and sub-location identifiers, therefore the message is not retained if the message was previously received and stored. In fact, the messaging device could be specifically programmed to delete messages if the "NYC" location identifier is not indicated or specifically programmed to delete messages if the "MEX" is indicated. Message 9 and 10 merely show examples of "override" type messages that would store and automatically display (or alternatively store and not display

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in the case of message 10) regardless of what location identifiers and time indicators are received at the messaging device.

In another aspect of the present invention, an address list containing a target address and corresponding valid location indication could be stored within a memory location in a messaging device. The memory location could contain the exemplary look-up table found below:

TARGET / ADDRESS	WHERE VALID
123	A
456	A,B
987654	everywhere
789	ALL but E

Preferably, the messaging device would first determine its current location and then enable its target addresses. Subsequently, the messaging device would store messages for the enabled targets and otherwise ignore messages for its disabled targets. This look-up table could handle the storage mechanism of the device.

As an example, a messaging device that recognizes its location as being location "A" or location "B" which further receives a message with a target address of "456" would store this particular message. If the messaging device recognizes its location as being something other than location "A" or "B", then the message is not stored. As another example, if the messaging device is in location "A" and receives a message with a target address of "789", then the message is stored. If the same message with the target address of "789" were received in a location the messaging device recognizes as location "E", then the message would not be stored.

In addition to the storage scheme described above, the messaging device would preferably have a display algorithm for messages already stored that could be controlled by a separate look up table such as the following:

T140X

LOCATION	MESSAGE	DISCARD	ALERT	DISPLAY
A	1		√	√
B	2		X	√
C	3			
D	4		X	X
E	5	√		
NOT F	6	√		

Thus, in accordance with the look-up table above, a messaging device entering location "A" would alert the user and display message 1. The user of a messaging device entering location "B" can see message 2, but the user would not be alerted. In another instance, a user of a messaging device entering location "D" will not be alerted and will not be able to display message 4. Depending upon the algorithm, message 4 may then subsequently be displayed when the messaging device recognizes that it is not within location "D". Further in accordance with the table above, the messaging device would discard message 5 upon recognition by the messaging device of its presence in location "E". Likewise, message 6 would be discarded upon recognition by the messaging device of a location other than location "F".

It should be understood that the disclosed embodiments are merely examples and the invention is not restricted thereto. It will be understood by those skilled in the art that variations and modifications can be made within the scope and spirit of the present invention as defined by the appended claims.

What is claimed is:

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CLAIMS

1. A method of processing spatially sensitive information at a selective call receiver, comprising the steps of:

receiving the spatially sensitive information along with an associated identifier;

storing the spatially sensitive information if the associated identifier is valid;

detecting a change in the associated identifier as the selective call receiver roams from a first area to a second area; and

processing the spatially sensitive information.

2. The method of claim 1, wherein the method further comprises the step of deleting at least portions of the spatially sensitive information.

3. The method of claim 1, wherein the method further comprises the step of at least displaying portions of the spatially sensitive information.

4. The method of claim 1, wherein the method further comprises the step of deleting at least portions of the spatially sensitive information when the user prompts the selective call receiver to display at least portions of the spatially sensitive information.

5. The method of claim 1, wherein the method further comprises the step of automatically deleting at least portions of the spatially sensitive information when the memory of the selective call receiver is filled beyond a threshold level and otherwise deleting said at least portions of the spatially sensitive information when the user prompts the selective call receiver to display a message.

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6. A method of processing a message among a plurality of messages received over the air at a selective call receiver, comprising the steps of:

receiving the plurality of messages, at least a portion of the messages being received with a relevancy status that includes a space/time indicator;

storing the messages if the relevancy status matches a stored relevancy status at the selective call receiver;

tagging the messages for processing when the space/time indicator changes; and

processing the messages that were tagged.

7. The method of claim 6, wherein the step of tagging further comprises the step of tagging the messages when the space/time indicator indicates a change in location.

8. The method of claim 6, wherein the step of tagging further comprises the step of tagging the messages when the space/time indicator indicates a change in time beyond a threshold period.

9. The method of claim 6, wherein the step of processing further comprises the step of deleting messages that have an invalid space/time indicator.

10. The method of claim 6, wherein the step of processing further comprises the step of displaying at least portions of the messages that were tagged.

10. A messaging device for receiving a plurality of messages, at least a portion of the plurality of messages having a relevancy status, the messaging device comprising:

a selective call receiver for receiving the plurality of messages, the relevancy status for the portion of the plurality of messages, and updates to the relevancy status;

a memory for storing at least a portion of the plurality of messages and the updates to the relevancy status; and

a processor for processing the portion of the plurality of messages that have received updates to the relevancy status.

11. The messaging device of claim 10, wherein the relevancy status is a location identifier.

12. The messaging device of claim 11, wherein the location identifier is selected from the group consisting of Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter colorcode, and a prohibited location identifier.

13. The messaging device of claim 10, wherein the messaging device further comprises a real time clock.

14. The messaging device of claim 13, wherein the messaging device receives an address that includes the relevancy status, wherein the relevancy status is selected from the group consisting of Simulcast System Identifier (SSID), Network Identifier (NID), Service Provider Identifier (SPID), Zone Identifier, Subzone Identifier, market indicator, information identifier, transmitter colorcode, prohibited location identifier, and timeout indicator.

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15 ~~16~~. The messaging device of claim 10 ~~11~~, wherein the messaging device further comprises a transmitter.

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~~17~~. A messaging device for receiving a plurality of messages, at least a portion of the plurality of messages having a location identifier, the messaging device comprising:

a selective call receiver for receiving the plurality of messages, the location identifier for the portion of the plurality of messages, and updates to the location identifier;

a first memory location for storing a list of existing location identifiers;

a second memory location for storing at least a portion of the plurality of messages, the location identifier for the portion of the plurality of messages, and the updates to the location identifiers; and

a processor for processing the portion of the plurality of messages that have a location identifier by comparing the first memory location with the second memory location.

17 16
~~18~~. The messaging device of claim ~~17~~, wherein the messaging device is a one-way selective call receiver and the processor stores a message and enables the display of the message if a match is found between the existing location identifiers and the location identifier associated with the message.

18 16
~~19~~. The messaging device of claim ~~17~~, wherein the messaging device is a one-way selective call and the processor does not store a message if a match is found between the existing location identifiers and the location identifier associated with the message.

19 16
~~20~~. The messaging device of claim ~~17~~, wherein the messaging device is a one-way selective call and the processor deletes an existing message from the second memory if a match is found between the existing location identifiers and the location identifier associated with the message.

19

20 16
~~21~~. The messaging device of claim ~~17~~, wherein the messaging device further comprises a transmitter.

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GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING

Abstract of the Disclosure

A messaging device for receiving a plurality of messages that have a relevancy status includes a selective call receiver (22) for receiving the plurality of messages, the relevancy status, and updates to the relevancy status, a memory (30) for storing at least a portion of the plurality of messages and the updates to the relevancy status and a processor (24, 40 and 28) for processing the portion of the plurality of messages that have received updates to the relevancy status. The relevancy status is ideally a location identifier and could additionally include a valid time indication.

08822024-032497

COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

Attorney Docket **PF01297NA**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING**, the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____ as Application No. _____
and was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

			Priority Claimed
_____	_____	_____	☐ Yes ☐ No
(Number)	(County)	(Day/Month/Year Filed)	
_____	_____	_____	☐ Yes ☐ No
(Number)	(County)	(Day/Month/Year Filed)	

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

_____	_____
(Application Number)	(Filing Date)
_____	_____
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Charles W. Bethards, Reg. No. 36,453
R. Louis Breeden, Reg. No. 37,286
Philip P. Macnak, Reg. No. 33,308
Pablo Meles, Reg. No. 33,739
John H. Moore, Reg. No. 27,149
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Send Written Correspondence To:

MOTOROLA, INC.
Intellectual Property Dept.
5401 North Beach Street, MS E230
Fort Worth, TX 76137
Direct Telephone Calls to: (817) 245-4604

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF FIRST INVENTOR	INVENTOR'S SIGNATURE:	DATE:
Alain Charles Louis Briancon		3/21/96
RESIDENCE: 2808 Roundrock Trail, McKinney, Texas 75070		CITIZENSHIP: USA
POST OFFICE ADDRESS: Same as above		

FULL NAME OF SECOND INVENTOR	INVENTOR'S SIGNATURE:	DATE
Terence Edward Sumner		3/24/97
RESIDENCE: 2057 Spinnaker Lane, Azle, TX 76020 USA		CITIZENSHIP: USA
POST OFFICE ADDRESS: Same as above		

Prior Art #2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DOCKET NUMBER: **PF01297NA**

APPLICANTS: **Briancon, et al.**

FILED: **Herewith**

ENTITLED: **GEOGRAPHIC-TEMPORAL SIGNIFICANT MESSAGING**

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97

BOX: Patent Application
Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Sir:

Under 37 C.F.R. §§ 1.56 and 1.97 et seq., the following references are disclosed which may be material to the examination of this application. A Form PTO-1449 is enclosed which lists the enclosed references.

No inference should be drawn that the attached list represents a comprehensive investigation of the prior art; that any or all are pertinent to the invention; that the apparatus therein is analogous to the invention; or that any apparatus disclosed is the equivalent of the subject invention.

All of applicant's claims are believed to be allowable over the references listed on Form PTO-1449.

XX No additional fee is required. This Information Disclosure Statement is being submitted in accordance with 37 C.F.R. 1.97(b) prior to one of the following events, whichever occurred last, including: (1) within three months of the filing date of a national application, (2) within three months of the date of entry of the national stage in an international application, or (3) before the mailing date of the first Office action on the merits.

____ This Information Disclosure Statement is being submitted in accordance with 37 C.F.R. 1.97(c) after one of the following events, whichever occurred last, including: (1) within three months of the filing date of a national application, (2) within three months of the date of entry of the national stage in an international application, or (3) before the mailing date of the first Office action on the merits, but prior to the mailing date of either (1) a final action, or (2) a notice of allowance.

____ No fee is required, because a certification under 37 C.F.R. 1.97(e) is attached.

____ A fee under 37 C.F.R. 1.17(p) of $220.00 is required, because no certification under 37 C.F.R. 1.97(e) has been made.

____ This Information Disclosure Statement is being submitted in accordance with 37 C.F.R. 1.97(d) after one of the following events, whichever occurred first, the mailing date of either (1) a final action, or (2) a notice of allowance, but before payment of the issue fee. In addition, a certification under 37 C.F.R. 1.97(e) and a petition requesting consideration of the Information Disclosure Statement is attached. A fee under 37 C.F.R. 1.17(i)(1) of $130.00 is required for the petition[a].

____ Please charge Deposit Account No. 13-4778 in the amount of $_____. Two duplicate copies of this sheet are enclosed.

_X_ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Account No. 13-4778. Two duplicate copies of this sheet are enclosed.

Respectfully submitted,

Briancon, et al.

Pablo Meles

Pablo Meles, Reg. No. 33,739
Phone: (817) 245-2571
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Please direct all correspondence to:

Motorola, Inc.
Intellectual Property Department
5401 N. Beach Street, MS E230
Fort Worth, TX 76137

#2

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1997
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Form PTO-1449

LIST OF ART CITED BY APPLICANT

ATTY. DOCKET NO.	SERIAL NO.	FILING DATE
PF01297NA	08822024	Herewith
APPLICANT		**GROUP**
Briancon, et al.		2735

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
JBJG	AA	5,225,826	07/06/93	DeLuca, et al.	340/825.44	340/311/1	08/06/91
JBJG	AB	5,504,476	04/02/96	Marrs, et al.	340/825.44	340/825.47	07/28/94
JBJG	AC	5,254,986	10/19/93	DeLuca	340/825.44	340/311.1	01/25/91
JBJG	AD	5,539,395	07/23/96	Buss, et al.	340/827	340/825.440	06/30/95
	AE						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
	BA							
	BB							

OTHER PRIOR ART

(Including Author, Title, Date, Pertinent Pages, Etc.)

	CA	
	CB	
	CC	
	CD	
	CE	
	CF	

EXAMINER	DATE CONSIDERED
Jean Flanklands	4-28-98

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant

CM000096U AA

US005225826A

United States Patent [19]

DeLuca et al.

[11] Patent Number: 5,225,826

[45] Date of Patent: Jul. 6, 1993

[54] VARIABLE STATUS RECEIVER

[75] Inventors: Joan S. DeLuca; Michael J. DeLuca, both of Boca Raton, Fla.

[73] Assignee: Motorola, Inc., Schaumburg, Ill.

[21] Appl. No.: 742,220

[22] Filed: Aug. 6, 1991

Related U.S. Application Data

[63] Continuation of Ser. No. 402,936, Sep. 5, 1989, abandoned.

[51] Int. Cl.[5] H04B 7/00

[52] U.S. Cl. 340/825.44; 340/311.1; 340/825.47; 340/825.48

[58] Field of Search 340/825.44, 825.46, 340/825.47, 825.48, 309.4, 309.15, 309.5, 311.1; 455/31, 32, 38

[56] References Cited

U.S. PATENT DOCUMENTS

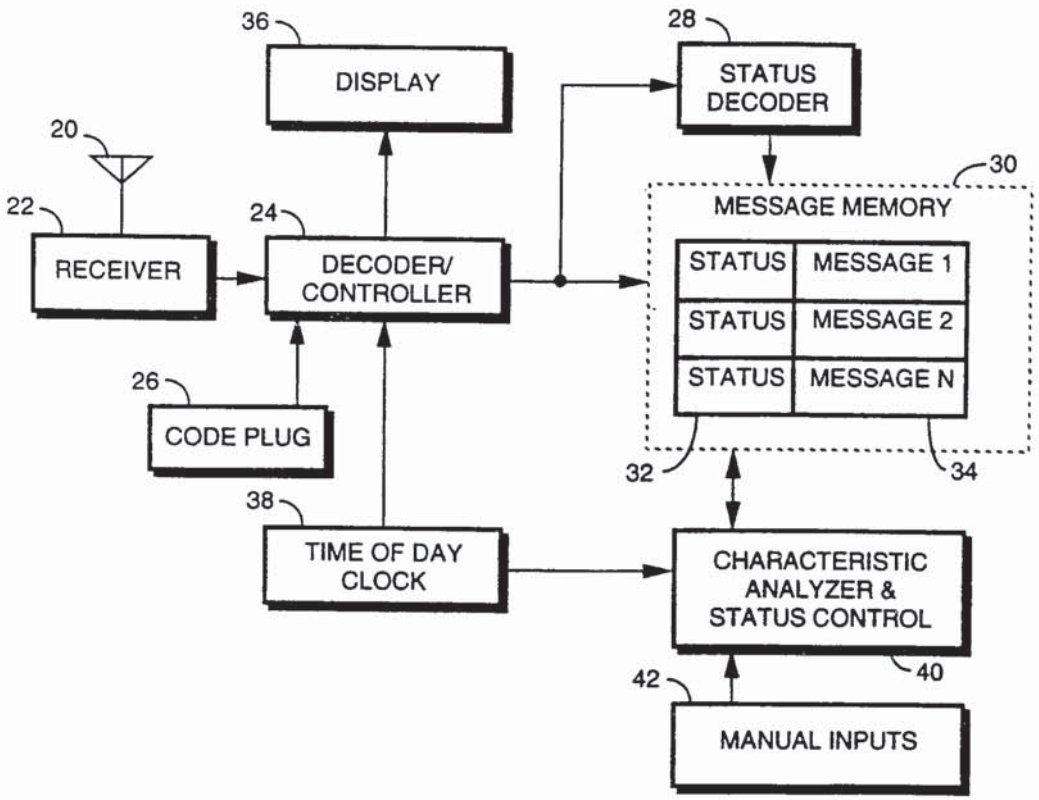
4,383,257	5/1983	Giallanza et al.	340/825.47
4,839,641	6/1989	Mori et al.	340/825.48
4,851,829	7/1989	DeLuca et al.	340/825.44
4,860,005	8/1989	DeLuca et al.	340/825.44
4,872,005	10/1989	DeLuca et al.	340/825.46
4,894,649	1/1990	Davis	340/309.4
4,896,306	1/1990	Sanbongi et al.	368/41
4,910,510	3/1990	Davis et al.	340/825.44

Primary Examiner—Donald J. Yusko
Assistant Examiner—Dervis Magistre
Attorney, Agent, or Firm—Daniel R. Collopy; William E. Koch; Thomas G. Berry

[57] ABSTRACT

A selective call receiver, such as a pager, has a real-time clock and is capable of determining the response of the receiver to a message in accordance with a status associated with that message. The selective call receiver can also change the status at a selected time or if a characteristic of the message matches a predetermined characteristic. Additionally the selective call receiver may choose from a plurality of priorities, a priority of a received message in order to determine if a message stored in the memory of the selective call receiver will be deleted by the received message. The selective call receiver is further capable of determining the type of data decoded by an address with respect to the time of day.

45 Claims, 9 Drawing Sheets



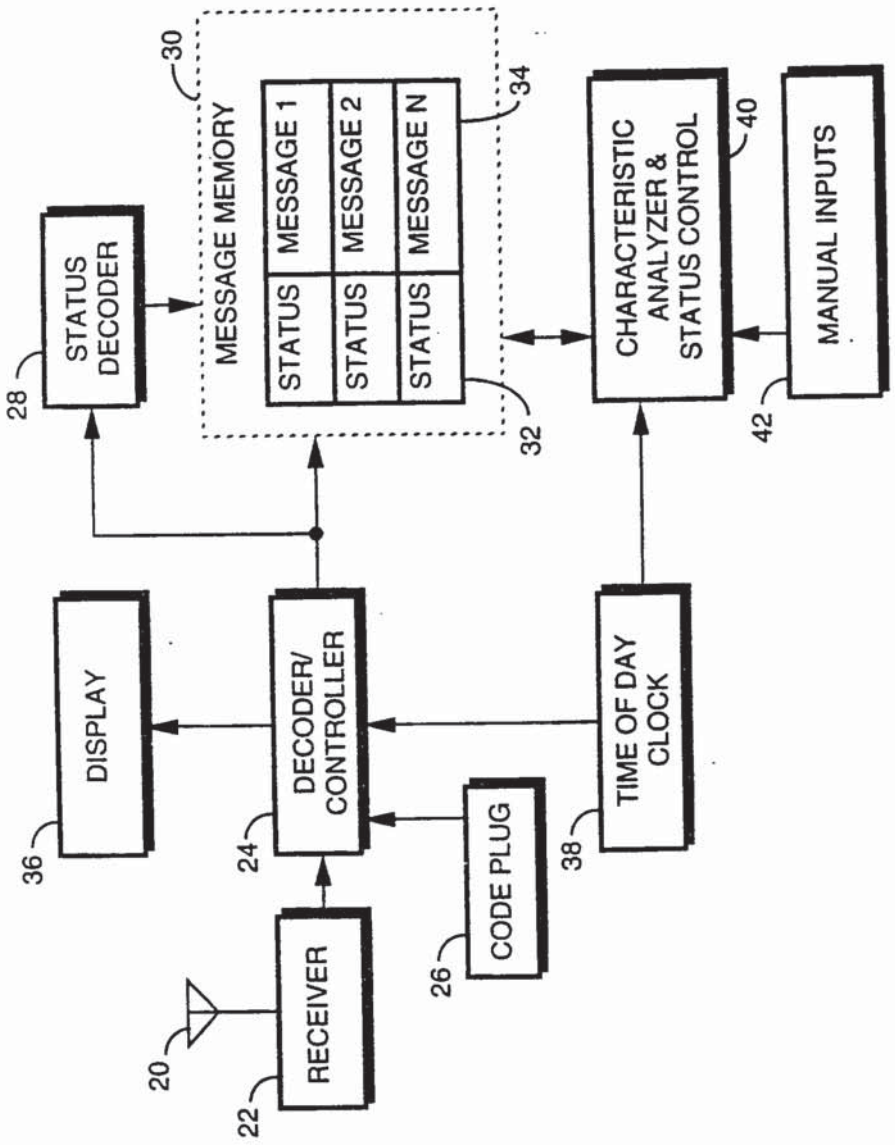

30
MESSAGE MEMORY
STATUS
MESSAGE 1
STATUS
MESSAGE 2
STATUS
MESSAGE N
34
32
STATUS DECODER
28
CHARACTERISTIC ANALYZER & STATUS CONTROL
40
MANUAL INPUTS
42
DISPLAY
36
DECODER/ CONTROLLER
24
TIME OF DAY CLOCK
38
CODE PLUG
26
RECEIVER
22
20

FIG. 1

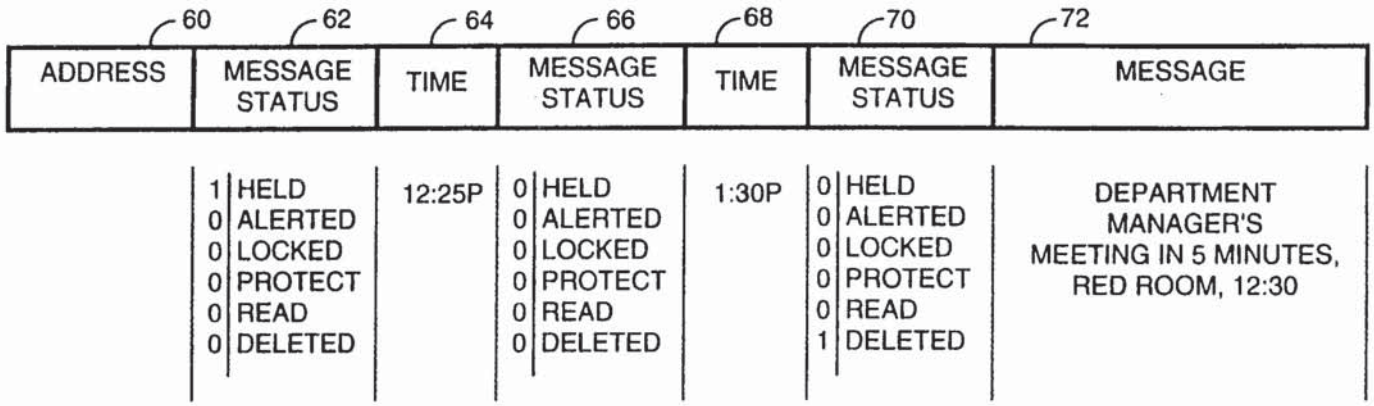

60
62
64
66
68
70
72
ADDRESS
MESSAGE STATUS
TIME
MESSAGE STATUS
TIME
MESSAGE STATUS
MESSAGE
1 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
12:25P
0 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
1:30P
0 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
1 DELETED
DEPARTMENT MANAGER'S MEETING IN 5 MINUTES, RED ROOM, 12:30

FIG. 2

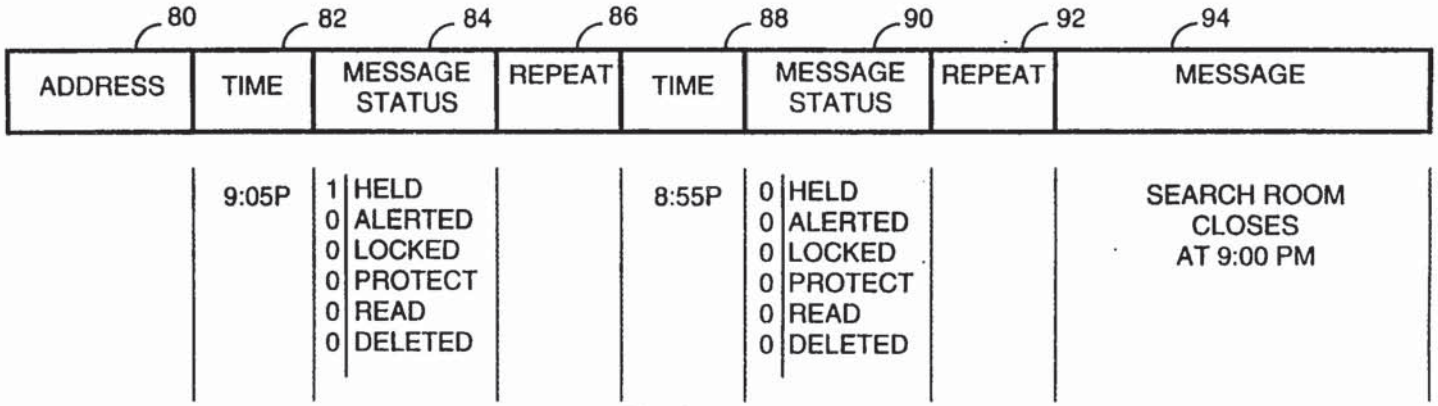

80
82
84
86
88
90
92
94
ADDRESS
TIME
MESSAGE STATUS
REPEAT
TIME
MESSAGE STATUS
REPEAT
MESSAGE
9:05P
1 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
8:55P
0 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
SEARCH ROOM CLOSES AT 9:00 PM

FIG. 3

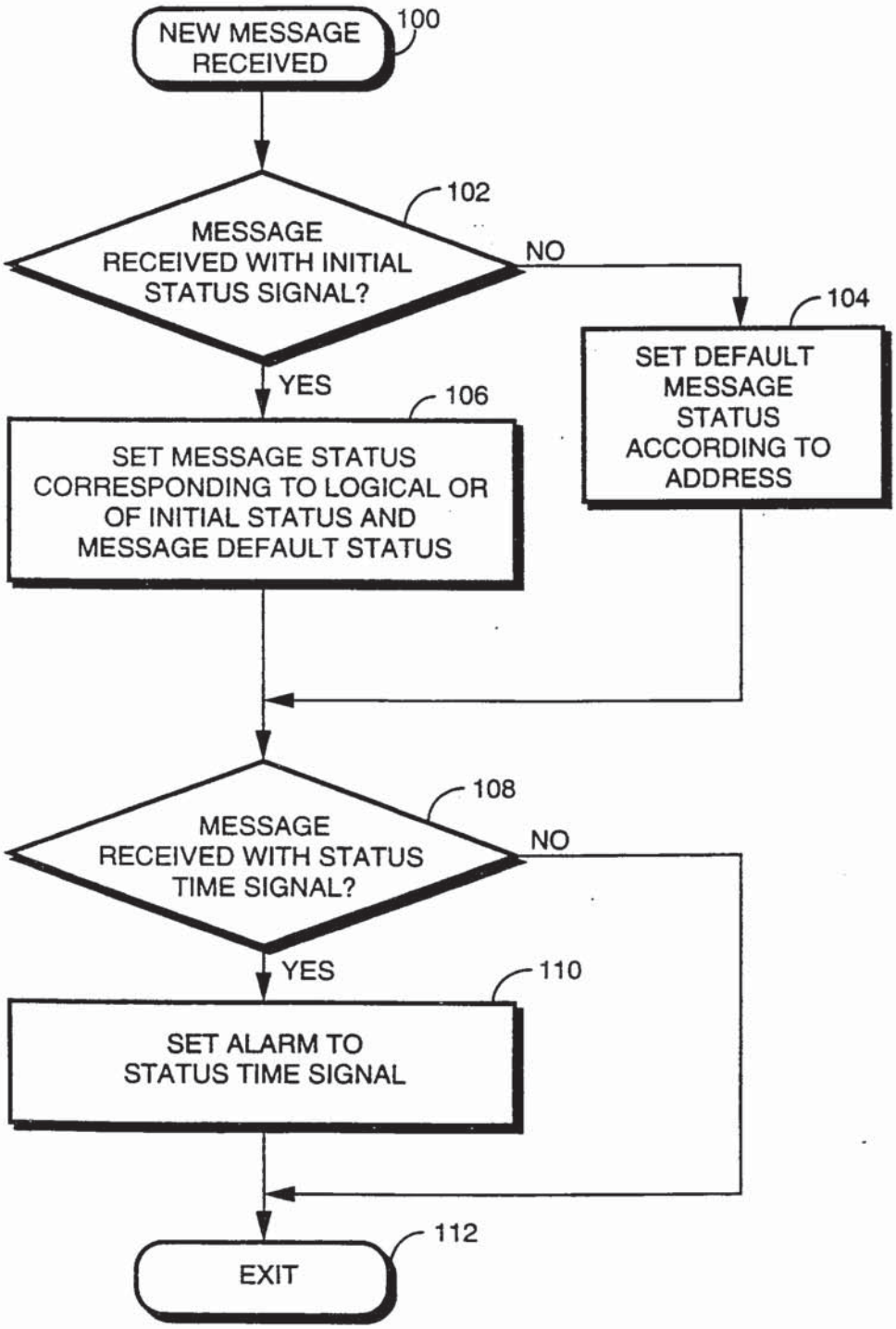

NEW MESSAGE RECEIVED
100
MESSAGE RECEIVED WITH INITIAL STATUS SIGNAL?
102
NO
YES
SET DEFAULT MESSAGE STATUS ACCORDING TO ADDRESS
104
SET MESSAGE STATUS CORRESPONDING TO LOGICAL OR OF INITIAL STATUS AND MESSAGE DEFAULT STATUS
106
MESSAGE RECEIVED WITH STATUS TIME SIGNAL?
108
NO
YES
SET ALARM TO STATUS TIME SIGNAL
110
EXIT
112

FIG. 4

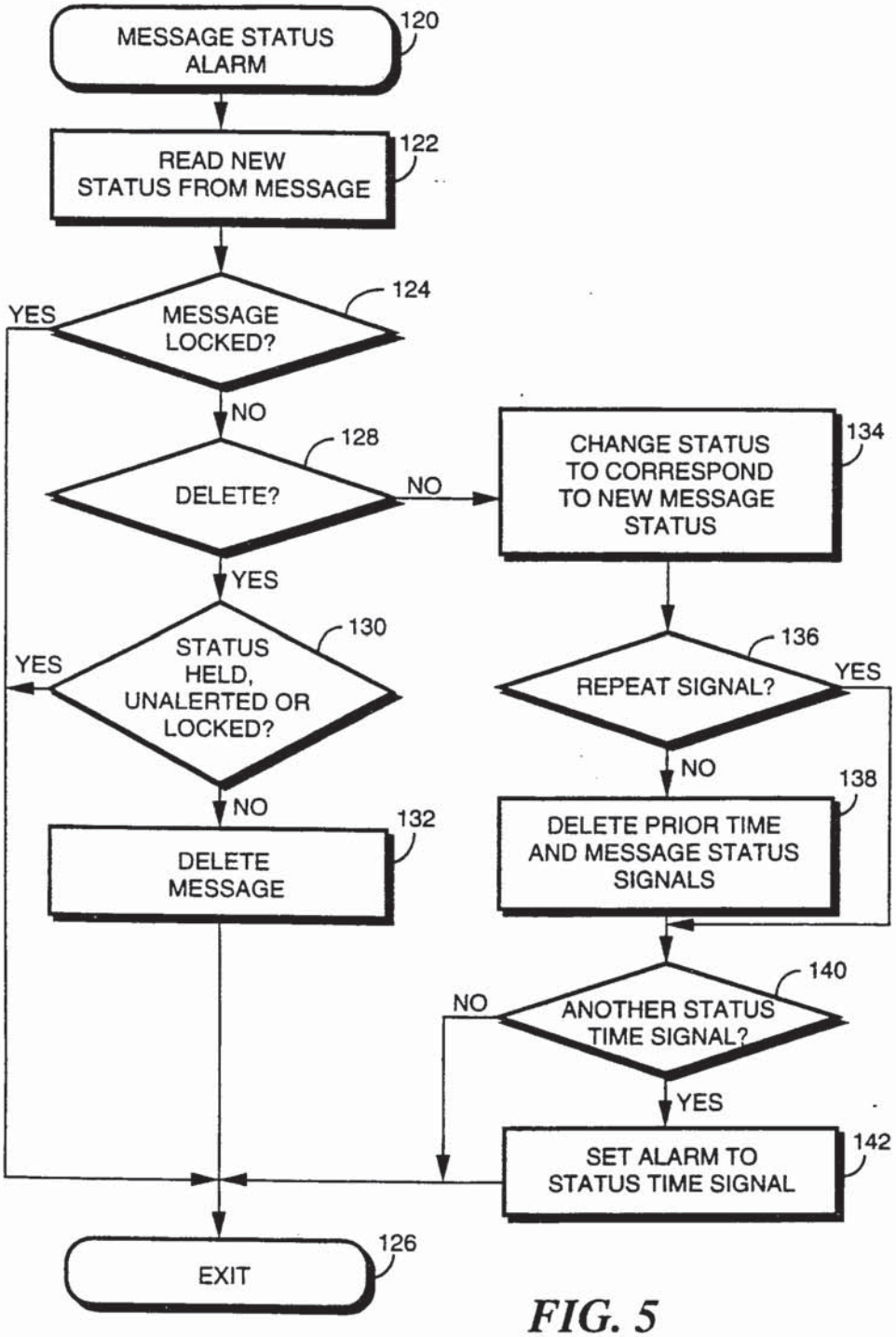

MESSAGE STATUS ALARM
120
READ NEW STATUS FROM MESSAGE
122
MESSAGE LOCKED?
124
YES
NO
DELETE?
128
NO
CHANGE STATUS TO CORRESPOND TO NEW MESSAGE STATUS
134
YES
STATUS HELD, UNALERTED OR LOCKED?
130
YES
REPEAT SIGNAL?
136
YES
NO
DELETE MESSAGE
132
NO
DELETE PRIOR TIME AND MESSAGE STATUS SIGNALS
138
ANOTHER STATUS TIME SIGNAL?
140
NO
YES
SET ALARM TO STATUS TIME SIGNAL
142
EXIT
126

FIG. 5

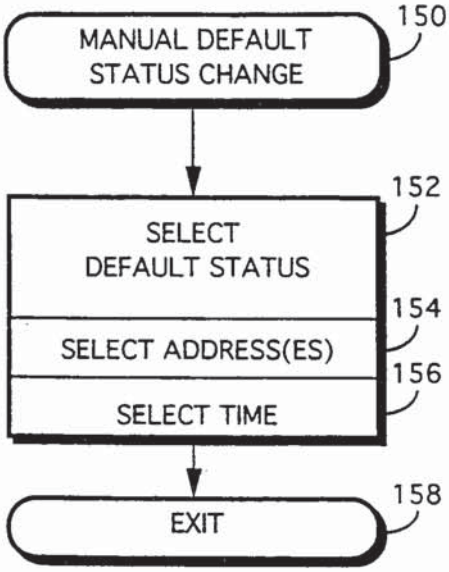


FIG. 6

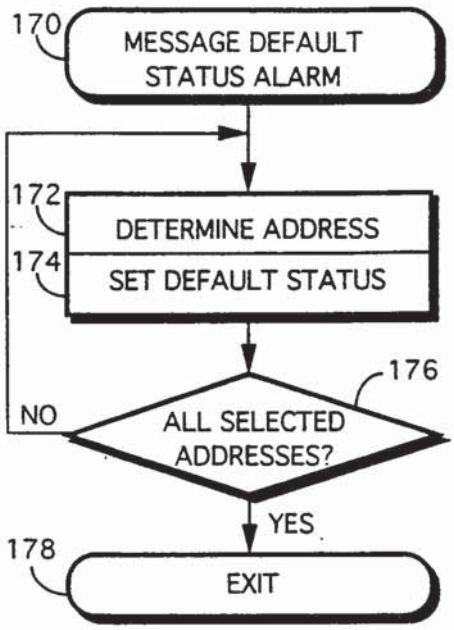


FIG. 8

	TIME	ADDDRESS	MESSAGE STATUS
162	8:00A	A & C	1 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 0 DELETED
162	10:00A	A & C	0 HELD 0 ALERTED 0 LOCKED 1 PROTECT 0 READ 0 DELETED
162	--	D	0 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 1 DELETED

FIG. 7

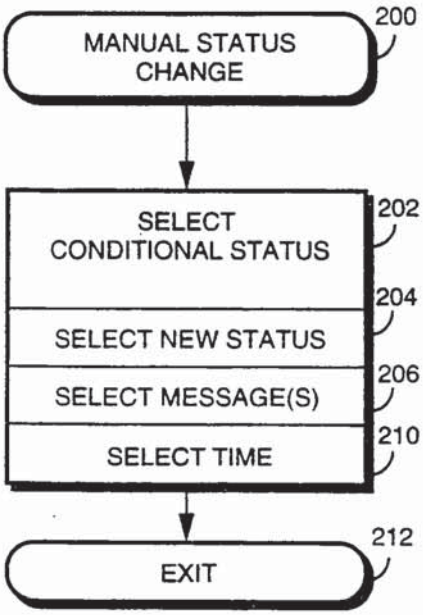

MANUAL STATUS CHANGE
200
SELECT CONDITIONAL STATUS
202
SELECT NEW STATUS
204
SELECT MESSAGE(S)
206
SELECT TIME
210
EXIT
212

FIG. 9

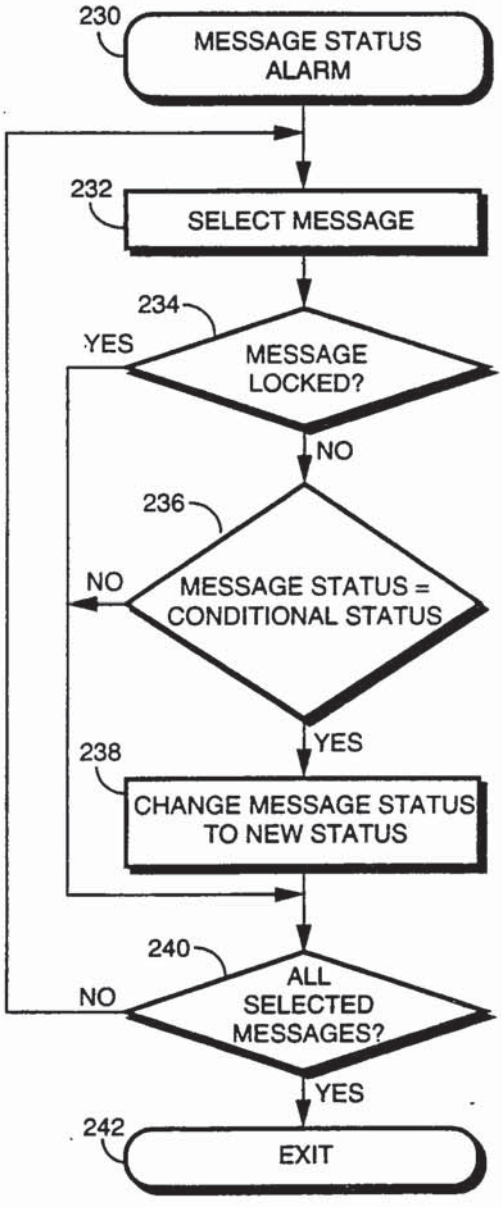

MESSAGE STATUS ALARM
230
SELECT MESSAGE
232
MESSAGE LOCKED?
234
YES
NO
MESSAGE STATUS = CONDITIONAL STATUS
236
NO
YES
CHANGE MESSAGE STATUS TO NEW STATUS
238
ALL SELECTED MESSAGES?
240
NO
YES
EXIT
242

FIG. 11

	TIME	ADDDRESS/ MESSAGE	CONDITIONAL STATUS	NEW STATUS
220	10:10A	A & C	1 HELD X ALERTED X LOCKED X PROTECT X READ X DELETED	0 HELD X ALERTED X LOCKED X PROTECT X READ X DELETED
222	5:05P	2	X HELD X ALERTED X LOCKED X PROTECT X READ X DELETED	0 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 1 DELETED
224	11:00P	ALL	0 HELD 1 ALERTED 0 LOCKED 0 PROTECT 1 READ 0 DELETED	0 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 1 DELETED
226	11:30P	ALL	0 HELD 1 ALERTED 0 LOCKED 1 PROTECT 0 READ 0 DELETED	0 HELD 1 ALERTED 0 LOCKED 0 PROTECT 1 READ 0 DELETED

FIG. 10

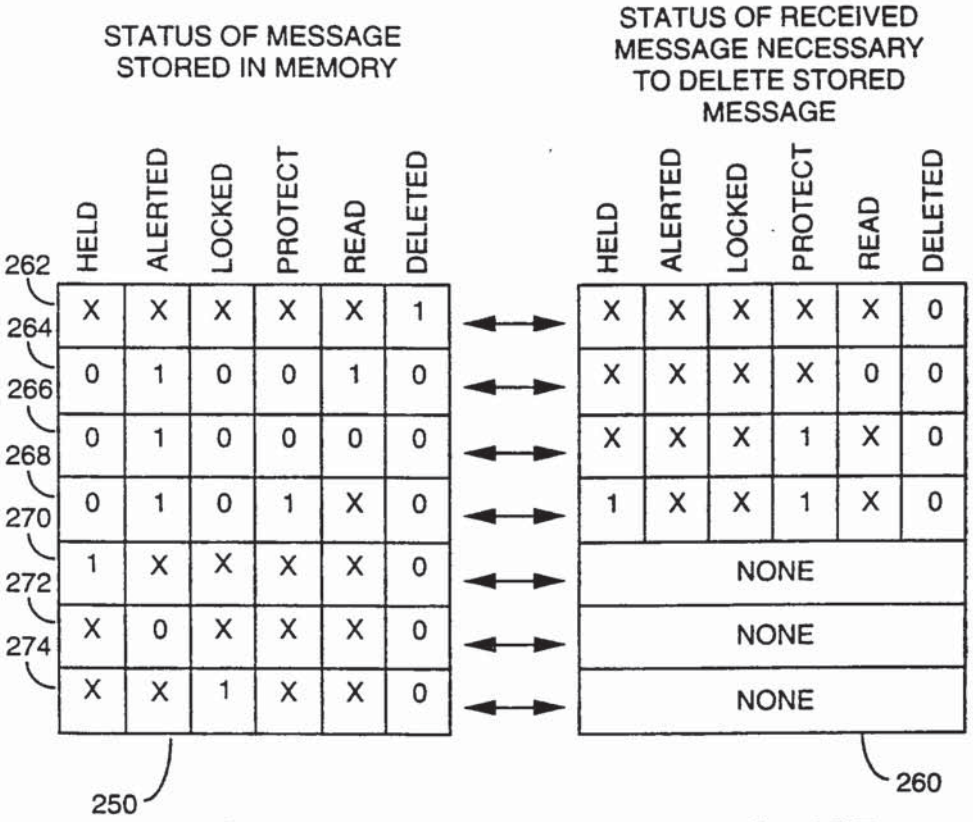


FIG. 12A

FIG. 12B

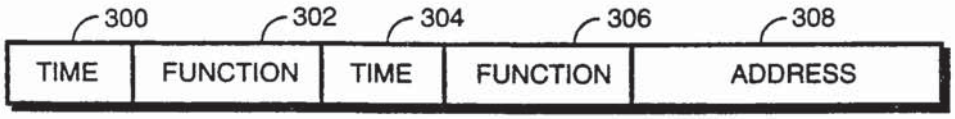


FIG. 13

320 FUNCTION	322 FORMAT	
0 0 0 0	TONE ONLY	NO PRIORITY
0 0 0 1	NUMERIC	NO PRIORITY
0 0 1 0	ALPHA	NO PRIORITY
0 0 1 1	GRAPHIC	NO PRIORITY
0 1 0 0	TONE ONLY	PRIORITY
0 1 0 1	NUMERIC	PRIORITY
0 1 1 0	ALPHA	PRIORITY
0 1 1 1	GRAPHIC	PRIORITY
1 0 0 0	VOICE	ANALOG
1 0 0 1	VOICE	LPC
1 1 1 1	INACTIVE	INACTIVE

FIG. 14

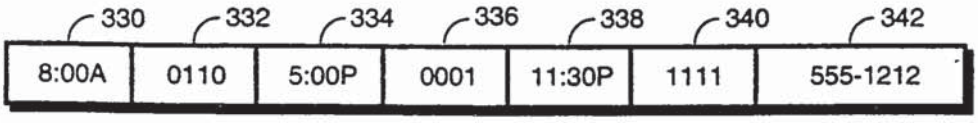


FIG. 15

VARIABLE STATUS RECEIVER

This is a continuation of application Ser. No. 07/402,936 filed on Sep. 5, 1989, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to a selective call receiver, such as a pager, which has the ability to store and respond to different messages, either at the time of receipt of such messages or at a subsequent time, in accordance with a status associated with that message. The invention also relates to a method of operation of such a selective call receiver.

SUMMARY OF THE PRIOR ART

Today, paging services offered to customers are becoming more and more sophisticated. To keep track with these services, more sophisticated page handling features and page types are required in the pagers of users subscribing to such services.

Existing pagers assign a predetermined status to a received message and store the received message in memory. The status of the message determines the manner in which the pager is to respond to that message, either at the time of receipt of the message, or at some future event time, such as when the user reads the message onto the screen, or when another message is received. The message status is a digital word including bits indicative of the following conditions: alerted/unalerted, protected/unprotected, read/unread and present/deleted. A pager with such an operation is shown in U.S. Pat. No. 4,851,829 to DeLuca et al, which is assigned to the assignee of the present invention and which is hereby incorporated by reference. An unalerted message is a message which has been received and needs to have an alert signal generated to indicate to the user that the message has been received. Upon generating an alert associated with the message the status changes to alerted. An unread message is one which has not yet been displayed on the pager display. Upon reading the unread message, the status is changed to the read status. When a message has a protected status, this can indicate that it is not to be overwritten by new incoming messages. Alternatively, the protected/unprotected status of a message may determine under what circumstances the message can be deleted by the user. For each of the aforementioned aspects of a message status, the response of the receiver to the message is controlled in accordance with the status.

It is known to provide a pager having a time of day clock, the pager being capable of reminding a user of an important message event, such as a pager in which an alert signal is issued at a time determined by the time of day clock. Such a pager is described in U.S. Pat. No. 4,872,005 to DeLuca et al. and assigned to Motorola Inc., said patent hereby incorporated by reference.

It is also known to control power-on times and power-off times of a pager in accordance with a time of day clock. Such a pager is described in U.S. Pat. No. 4,860,005, to DeLuca et al. and assigned to Motorola Inc., said patent also hereby incorporated by reference.

As pagers and paging systems become more widely used, and the throughput of messages increases very rapidly, an increasingly greater burden is placed on the pager user in such respects as remembering what messages are stored in the pager and the efficient management of the messages stored within the pager memory.

It is often important that a stored message should not be overlooked, but as the rate of receipt of messages increases, a user is increasingly less encouraged to keep track of the received messages. On the other hand, for most messages, there comes a point where the message is so out of date that the message merely clutters up the memory and makes the user's task more difficult. Additionally, it is desirable to provide a means for not receiving messages which are not important to the user. Furthermore it is important to keep message management a relatively simple task for the pager user in view of increasing message throughput.

It is therefore an object of the present invention to provide an improved pager, which alleviates some or all of the aforementioned problems.

SUMMARY OF THE INVENTION

In carrying out the objects of the invention in one form, there is provided a selective call receiver comprising means for receiving a selective call message at a first time. The selective call message comprises an address, a message and message status information. The selective call receiver also comprises means for storing the messages and a message status associated therewith and means for handling the message in accordance with the message status. The selective call receiver further comprises means for automatically changing the message status to one of a plurality of predetermined message statuses, the one of the plurality of predetermined message statuses determined in response to the message status information. After the automatic changing means automatically changes the message status to the one of the plurality of predetermined message statuses, the message handling means thereafter handles the message in accordance with the one of the plurality of predetermined message statuses.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the block diagram of a paging receiver operating in accordance with the present invention.

FIG. 2 shows an example of a message signal having various status signals and message information.

FIG. 3 shows another example of a message signal.

FIG. 4 shows a flowchart for assigning a default status to a message received by the pager and setting a time for changing the status of the message.

FIG. 5 shows a flowchart for changing the status of a message in response to signals within the message.

FIG. 6 shows a flowchart for setting the predetermined default status of a message used in step 104 of FIG. 4.

FIG. 7 shows a table generated by the flowchart of FIG. 6.

FIG. 8 shows a flowchart for changing the default status used in FIG. 4 in response to the time of day.

FIG. 9 shows manually changing the status of messages received and stored in the message memory in response to the characteristic of the message.

FIG. 10 shows a table of times generated by the flowchart of FIG. 9 for changing the status of messages stored in the message memory.

FIG. 11 shows a flowchart for changing the status of a message in response to the table of FIG. 10.

FIGS. 12A and 12B show truth tables illustrating the status of a received message necessary to delete messages of various statuses from the message memory.

FIG. 13 shows a address signal stored in the code plug with corresponding functions time and function signals.

FIG. 14 shows a table relating the function signal to the type of message received by the pager.

FIG. 15 shows an example of the changing functions of an address with respect to time.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

In order to best illustrate the utility of the present invention, it is described in conjunction with a communication receiver, such as a paging receiver, capable of receiving and decoding selective call signals, the selective call signals including at least one data message. While the present invention is described hereinafter with particular reference to a paging receiver, it is to be understood at the outset of the description which follows, it is contemplated that the apparatus and method, in accordance with the present invention, may be used with numerous other communication receivers.

The paging receiver herein is associated with a paging system having a base station terminal. The receiver responds to control and data information from the base station terminal, and in turn stores and provides data messages to a user during operation.

FIG. 1 illustrates the block diagram of a paging receiver 10 operating in accordance with the present invention. Radio frequency modulated selective call paging signals are received on antenna 20 demodulated by receiver 22 and decoded by decoder 24. Decoder 24 compares address signals within the selective call signal with at least one predetermined address signal stored within code plug 26. In response to detecting an address assigned to the pager, a message signal following the address is processed. Status decoder 28 determines if the message signal includes status and timing information and stores said information in a status area 32 within message storage memory 30. If no initial status information is included, a default status is assigned to the message. The message information is stored in a message area 34 within message memory where each message has a corresponding status signal. The pager also has a display 36 for displaying message information as well as time of day information as determined by a time of day clock 38. Time of day clock 38 may also provide day and date information and is capable of generating alarms in response to the time of day being equal to a time set by various functions of the pager. The status of messages stored in message memory may be changed by characteristic analyzer and status control means 40 in response to the time of day clock 38 or under manual control from manual inputs 42 which may include a plurality of buttons for manually operating various functions of the pager. Decoder 24 further analyzes the status assigned to a received message and the statuses of messages stored in the message memory 30 and determines which messages if any are to be deleted in order to store the message, or if the received message will be stored.

An enabling description of the invention may be realized with the aforementioned incorporated references and the figures describing the operation of the invention.

FIG. 2 shows an example of a message signal having various status signals and message information. The message signal is preceded by an address 60. The message signal consists of a first message status signal 62 which indicates a default status, followed by a time signal 64 and a corresponding second status signal 66, followed by a time signal 68 and a corresponding third message status 70 and followed by a message 72. The message 72 is "DEPARTMENT MANAGER'S MEETING IN 5 MINUTES, RED ROOM, 12:30". The message signal provides for establishing a default status for the message and changing the status of the message at two times during the day.

The message status as indicated by the status signals 62, 66, and 70 comprise six bits indicating a state of a corresponding status. The first status "HELD" indicates if the message is available for alerting and reading. A "0" for this status indicates the message is not held and a "1" for this status indicates the message is held. The held message provides no indication to the user that the message resides within the pager (except that a message received with the held status may delete messages of a lower status), thus the user may not read a message with a held status.

The "ALERTED" status indicates if an alert is to be generated for the message. Purposes for the alert include indicating the reception of the message and indicating a status change of the message. A "0" indicates that an alert is to be generated and a "1" indicates than an alert is not to be generated. In the normal operation of the pager having a multi-tasking microcomputer (as described in the aforementioned patents), the status of each message is periodically scanned and if a message has a "0" status for held (not held) and a "0" status for alerted, an alert is generated for the message. After completion of the alert, the alerted status is changed to a "1".

The "LOCKED" status indicates the message may not be deleted by an incoming message, or by a time executed status change. This provides the user with a way to insure that a message is never erased from memory by an automatic operation and that only a manual deletion may remove the message from memory. A "0" indicates the message is not locked while a "1" indicates the message is locked.

The "PROTECT" status indicates the message is protected from deletion by an incoming message, but may be deleted by a time executed status change. This insures that a message is not erased by an incoming message having a lower status but may be erased by an automatic operation or manual deletion. A "0" indicates the message is not protected while a "1" indicates the message is protected.

The "READ" status indicates if the message has been read by the user of the pager. A "0" indicates the user has not read the message. After reading a message, the status is set to a "1". This status is used for determining deletion priority of a message in response to an incoming message or to generate an "unread message alert" if the pager is switched off with unread messages.

The "DELETED" status indicates if the message is present in the pager. A "0" indicates the message is present and a "1" indicates the message is deleted.

The aforementioned statuses control the way a message is handled by the pager. The message of FIG. 2 is received with a default status indicating the message is held, status signal 62. Thus the message is stored in memory and no indication is given to the user that the message has been received. For example, the message of FIG. 2 may have been sent at 8:30 in the morning. Time signal 64 indicates that at 12:25 PM the message status is to be changed to correspond to status signal 66 which

releases the message from the held state. Consequently an alert is generated in response to which the pager user reads the message indicating a meeting will occur at 12:30 PM. The message remains in the pager until 1:30 PM when time signal **68** causes the message to be deleted as indicated by status signal **70**. Thus the message was sent to the pager substantially prior to the meeting, an alert was generated only prior to the meeting, and the message was deleted substantially after the beginning of the meeting. The message did not clutter the user operations of the pager until just prior to the meeting. The sequence management by the pager user.

FIG. **3** shows another example of a message signal. Following the address **80** is a time signal **82**. The absence of a status signal after the address, as in address signal **62**, indicates a predetermined default status is to be assigned to the message. However, at 9:05 PM, as determined by time signal **82**, the message status is changed to "HELD", thereby making the message inaccessible to the user. Following message status **84** is a repeat signal indicating that the status change of signal **84** is to be executed every time the time of day clock equals time signal **82**. Time signal **88** indicates that at 8:55 PM the message status is to be changed to correspond to message status signal **90**. The message status is changed to "UNHELD" and "UNALERTED" thereby causing the pager to generate an alert. In response to the alert, the user would read the message **94**, "SEARCH ROOM CLOSES AT 9:00 PM". Repeat signal **92** indicates that every time the time of day clock **38** equals time **88**, the status of the message is changed to correspond to message status signal **90**.

Thus the message signal of FIG. **3** is first received and alerted using a default priority. Thereafter, the message is alerted every day at 8:55 PM and held every day at 9:05 PM. The message appears in the user memory for ten minutes and is held the rest of the day thereby uncluttering the message from the user selection process and simplifying the operation of the pager.

It should be appreciated that the time signals of FIGS. **2** and **3** may also include day of week and date information thereby causing the status of messages to be changed additionally in response to this information. It should be further appreciated that message status and time signals of FIGS. **2** and **3** may be distinguished from the message by the use of predetermined control characters. Alternately, the status and time signals may be placed anywhere after the address signal. The messages status signal of FIGS. **2** and **3**, **60–70** and **82–86** along with a signal corresponding to a addresses **60** and **80** are stored in status area **32** of the message memory and the messages **72** and **94** are stored in message area **34** within the message memory.

FIG. **4** shows a flowchart for assigning a default status to a message received by the pager and setting a time for changing the status of the message. In step **100**, a new message is received. Step **102** checks if the message was received with an initial status. If no initial status was received (the signal of FIG. **3**), a predetermined default status is assigned to the message in step **104**. The predetermined default status may be permanently stored in code plug **26** or selected by means **42** in combination with time of day signals. The default status may further be dependent upon the address received with the message signal. If in step **102**, an initial status signal is received (signal **62** of FIG. **2**), step **106** sets the default status. In the preferred embodiment, step **106** performs the logical "OR" of the received initial status with the default status associated with the address preceding the message signal. Thus if the default status of messages associated with an address are "HELD", the received status would not clear the "HELD" status. The initial status is then deleted from the message signal. It should be appreciated that in an alternate embodiment, the message status of step **106** could be always set to correspond to the status received in the message signal. Furthermore, default status dependency based upon the address in steps **104** and **106** could be eliminated, thereby assigning a default status to all addresses. From either step **104** or **106**, step **108** checks if the message was received with a time signal. If true, step **110** sets an alarm in time of day clock **38** to correspond to the time signal. Finally, step **112** exits to the other operations of the pager.

FIG. **5** shows a flowchart for changing the status of a message in response to signals within the message. In step **120**, a message status alarm is generated by time of day clock **38**, as set by step **110** of FIG. **4**. In step **122**, the message corresponding to the alarm is determined and the new status corresponding to the alarm is read from the message memory. Step **124** determines if the message has been locked, thereby prohibiting the automatic changing of the status of the message. If true, step **126** exits to other operations of the pager. If unlocked, step **128** checks if a new status causes the message to be deleted. If true step **130** checks if the current status corresponds to held, unalerted or locked. If false, the message is deleted in step **132** and in step **126** other operations of the pager are executed. If true, step **126** is directly executed. Thus a message may not be deleted if it is either unread, held or locked. If in step **128** the result was false, step **134** changes the status of the message to correspond to the new message status. Then in step **136**, a repeat signal is checked to be associated with the time and status signal. If not found, the time and status are deleted. Then in step **140**, the message is checked for the next time signal subsequent to the time of day clock, and if found, step **142** sets the alarm to correspond to the time signal and step **126** returns to other pager functions. Subsequently, step **120** is again executed in response to the time of day clock being equal to the alarm set in step **142**. Thus the pager may modify the status of a message having time and status signal as shown by FIGS. **2** and **3**. It should be appreciated, that in view of this disclosure, many permutations and combinations may be made in modifying the status of a message while remaining within the scope of the invention.

FIG. **6** shows a flowchart for setting the predetermined default status of a message used in step **104** of FIG. **4**. The flowchart is entered at step **150** which may be made in response to a manual input from means **42**. In step **152**, the default status is selected from the available message statuses. The selection would also be made in response to manual inputs from means **42**. After selecting the status, an address corresponding to the status is selected at step **154**. Either a single address, or any combination of addresses, or all addresses stored in the code plug may be selected to correspond to the default status of step **152**. Then in step **156** a time for implementing the status is selected. The time selected in step **156** is programmed into the alarm of the time of day clock. In an alternate embodiment, this step may be eliminated thereby making the default status effective immediately. Furthermore, if a default status is not selected by FIG. **6**, it may be stored in the codeplug

thereby allowing selection at the time of programming the pager addresses.

FIG. 7 shows a table generated by the flowchart of FIG. 6. The table may be stored in memory within characteristic analyzer and status control means **40**. Table entry **162** shows that at 8:00 AM the default status associated with address "A" and "C" stored in the code plug correspond to the held status. Entry **164** shows that 10:00 AM the default status of "A" and "C" changes to the protected status. Table entry **166** has no associated time and is thereby always in effect for address "D". This status causes any message received on address "D" to be deleted upon reception.

FIG. 8 shows a flowchart for changing the default status used in step **104** of FIG. 4 in response to the time of day. In response to an alarm programmed in step **156**, step **170** is entered. Step **172** determines an address associated with the alarm and step **174** changes the default status associated with the address. Then step **176** checks if all addresses selected by step **154** have had their default statuses changed. If false, step **172** is again executed. If true, step **178** exits to other pager functions.

The pager operating in accordance with FIGS. **6–8** will hold messages received on address "A" and "C" between 8:00 AM and 10:00 AM. This time may correspond to the pager user being in an important meeting, and thus not wanting to be disturbed by the reception of the messages on these addresses. Messages received after 10:00 AM will be alerted upon reception and automatically protected from deletion by an incoming message. Messages received on address "D" will be arbitrarily deleted upon reception and no alert generated. Such messages may be received from one who the pager user has an adversarial relationship. The default status of messages received on address "D" may be manually changed at a later date if desired. The pager may also have a "B" address stored in the code plug. The default status could be either predetermined or stored in the codeplug. If the default status corresponded to all "0"s in the corresponding status states, messages received on this address would always be alerted upon reception, even in the aforementioned time between 8:00 AM and 10:00 AM where messages associated with address "A" and "C" were held, thereby unalerted.

FIG. 9 shows manually changing the status of messages received and stored in the message memory in response to the characteristic of the message. The characteristic of the messages may include the status of the message, the message number, and the address on which the message was received. In step **200**, the manual status change mode is entered in response to manual input from means **42**. In step **202**, a conditional status is selected, this status indicates the status of messages necessary before the status may be changed. Then in step **204**, the new status is selected. In step **206** messages for status change are selected. In step **210** a time for the status change is selected and programmed into an alarm within the time of day clock. Then step **212** exits to other paging functions. As in the flowchart of FIG. **6**, the selections of steps **202**, **204** and **206** may be made in response to manual inputs made on means **42** of FIG. **1**. Steps **206** and **210** may be eliminated thereby providing convenient operations on a plurality of messages. For example, the conditional status of step **202** may include all messages having the read status and the new status may cause all messages having the read status to be deleted from the pager memory. In this example, protected, locked, unalerted or held messages may not be deleted. This frees the user from the task of individually deleting read messages. Alternately the conditional status may include all messages having the held status and the new status would change the held messages to unalerted messages. In the example of FIGS. **6** through **8**, this could be used between 8:00 AM and 10:00 PM to determine if any messages were received on address "A" or "B". Furthermore, held messages could be changed to an unheld and alerted status, thereby forgoing the alert sequence and making the messages available for reading by the user. It should be further appreciated that step **206** may be executed and only held messages received on address "A" would be changed to an unheld status, thereby keeping messages received on address "C" in a held status.

FIG. **10** shows a table of times generated by the flowchart of FIG. **9** for changing the status of messages stored in the message memory. The table may be stored in memory within means **40** of FIG. **1**. Table entry **220** shows that at 10:10 AM the status of messages received on addresses "A" and "C" may be changed. The conditional status corresponds to the "HELD" state equaling a "1" and all other status states are "don't care" states. The new status corresponds to the "HELD" state being cleared, and not changing the state of the remaining statuses, thus making any held messages received on addresses "A" or "C" received prior to 10:00 AM available for alerting. When combined with the example of FIGS. **6–8**, entry **220** changes the held state of messages received between 8:00 AM and 10:00 AM at 10:10 AM. Entry **222** shows that at 5:05 PM message **2** (which corresponds to the order in which the message was received) has no conditional status required in order to change to a deleted status. Thus entry **222** provides for deleting message number **2** at 5:05 PM. Entry **224** shows that at 11:00 PM all messages having alerted and read statuses set and other states clear will have a status of deleted, thereby removing the message from the pager memory. And entry **226** shows that at 11:30 PM all messages having the alerted protect, and read statuses set will have the protect status cleared thereby providing for deletion of the message by an incoming message.

FIG. **11** shows a flowchart for changing the status of a message in response to the table of FIG. **10**. Step **230** is entered in response to the time selected in step **210**. In step **232** a message is selected in response to the address/message requirement of FIG. **10**. Then step **234** checks if the message is locked. If not, step **236** checks if the status of the message corresponds to the conditional status of FIG. **10**. If true, step **238** changes the status of the message to correspond to the new status of FIG. **10**. From either steps **234**, **236** or **238**, step **240** checks if all messages have been selected. If not, step **232** selects the next message in the message memory. If true, other paging functions are exited to by step **242**.

It should be appreciated that the times specified in steps **156** and **210** may either be repeating times, or times executed once and removed.

FIG. **12** shows truth tables illustrating the status of a received message necessary to delete messages of various statuses already stored in the message memory. Paging receivers have limited memory, and at times received messages may have to delete messages stored in the memory in order to be stored. Table **250** shows possible statuses of messages stored in message memory at the time of reception of a new message. Table **260** shows the status necessary to delete a message having a

status corresponding to table **250**. The status of table **260** is set by either steps **104** or **106** of FIG. **4**. An "X" entry in either table **250** or **260** indicates a don't care state. Line **262** indicates a message with the delete status set (a deleted message) may be replaced with any received message having the delete status cleared. Line **264** shows that a stored message having the alerted status and the read status set (a read message) may be deleted by a received message having the read status and deleted status cleared (an unread message). Line **266** indicates that a stored message having the alerted status set and all other statuses cleared (an unread message) may be deleted by a received message having the protect status set and the delete status clear (a protected message). Line **268** indicates that a message having the alerted and protect statuses set and the held, locked and deleted statuses cleared (a protected message) may only be deleted by a received message having the held and protect statuses set and the delete status cleared (a held protected message). Lines **270**, **272** and **274** indicate that messages that are held, unalerted or locked may not be deleted by a received message of any status.

In operation, a received message will be stored by first checking message storage statuses specified by line **262** then **264** then **266** and finally **268**. If a received message does not have a status corresponding to table **260**, it will not be stored in the message memory. Thus by setting or clearing the read, protect and held statuses of a received message, several message storage priorities for deletion of messages already stored in the memory result. Any of the bits of the status signal of the received message, either included in the message signal or set at the pager may be set or cleared by this invention. For example, a very low priority message could have a received status where the read status is set and all other statuses are clear. Such a message can not delete any messages stored in the pager but may only be stored in memory having already deleted messages, which corresponds to empty memory. If no empty memory were available, the message would not be stored. Alternately, a higher priority may be assigned to a message by clearing the all status bits in the received message (unread message), the received message may only be stored in empty memory or may delete read and alerted messages from the memory. Still higher priority may be realized by setting the protect status of a received message which provides for the deletion of unread and unprotected messages. Setting the hold and protect statuses provides for an even higher priority of message deletion in order to store the received message.

Thus a means for determining one of a plurality of priorities for a received message has been shown. The priority indicating which messages may be deleted in order to store the received message. The status shown in FIG. **12** may be converted to a numerical priority value for determining if a message may be deleted from memory. Thus a received message would have to have a higher priority value in order to delete a message from memory. For example the status of line **262** table **250** could have a priority of 0 while the status of line **262** table **260** could have a priority of 1. Similarly, priorities 2, 4 and 6 could correspond to the statuses of lines **264–268** of table **250** and priorities 3, 5 and 7 could correspond to the statuses of lines **264–268** of table **260**. The highest priority in this example could be **8** and assigned to the statuses of lines **270–274** of table **250**. In an alternate embodiment, the priority signal may be independent of the status signal and comprise a numerical value. Thus a received message having a first numerical priority may only delete a stored message having a second numerical priority less than the first numerical priority independent of the status of either message. Similar to the received message status, the priority of a received message may be included with the message or set at the receiver in response to the time of day and the address associated with the message. Furthermore, the priority of messages stored in the memory may be varied in response to the time of day and status of the message.

FIG. **13** shows am address signal stored in the code plug with corresponding function times and function signals. This aspect of the invention provides for the changing of the function of an address in response to the time of day. Time signal **300** indicates that the function described by function signal **302** is to be associated with the address at that time. At time **304** the function of the address is to be changed to that of function signal **306**. The address is shown by signal **308**.

FIG. **14** shows a table relating the function signal to the type of message received by the pager. Column **320** shows a four bit function signal and column **322** shows the corresponding pager format. The formats include tone numeric, alpha numeric and graphic messaging with and without priority, as well as analog and Linear Predictive Coding (LPC) voice messaging. Finally an inactivation function (**1111**) inhibits the address decoder of the pager from identifying the address from signals within the received paging signal. Additional functions may be added to the table of FIG. **14** as required by the paging system.

FIG. **15** shows an example of the changing functions of an address with respect to time. Signal **330** and **332** indicate that beginning at 8:00 AM, messages will be decoded as priority alpha messages. The priority indicates that an audio alert will be generated in response to the reception of the message even if the pager is set into a silent alerting mode. The alpha function indicates that the message signal after the address is to be decoded as alpha (ASCII) data. Signals **334** and **336** indicate that at 5:00 PM messages will be decoded as numeric messages having no alerting priority. Thus if the pager is set to a silent alert mode, no audio alert will be generated in response to the reception of the message, and the message signal following the address will be decoded as numeric (BCD) information. Finally, Signals **338** and **340** indicate that at 11:30 PM the address is deactivated, thereby not being recognized by the pager. In operation, function signal **332** is reactivated at 8:00 AM the next day. Address signal **342** indicates that the aforementioned functions are assigned to an address corresponding to the telephone number 555–1212.

Any number of time and functions signals may be associated with an address and a code plug may have a plurality of addresses each with associated time and function signals. The paging terminal which transmits the paging message must also be aware of the time of day and the function of an address of the pager in order to properly communicate messages to the pager. Furthermore, the time and function signals **300–306** may either be predetermined, stored in the code plug at the time of programming the address, or within a message received by the pager. Receiving time and function signals from the base station allows the paging system to more efficiently regulate the type of information transmitted to a pager, for example numeric information may be transmitted in busy hours and alpha or graphic infor-

mation transmitted when the transmitter is not busy, thereby having more time for transmitting longer alpha or graphic messages. Additionally, a transmitter may send the pager a new address with an initial function followed by a time and a deactivation function. This allows the paging system to provide a new service associated with the new address to a pager user for a limited time in order for the user to evaluate the service.

Although the invention has been shown by way of example, numerous modifications may be made to the invention while remaining with in the scope of invention which is defined by the following claims.

We claim:

1. A selective call receiver comprising:

means for receiving a selective call message, the selective call message comprising an address, a message and message status information and received at a first time;

means for storing the message and a message status associated therewith;

means for handling the message in accordance with the message status; and

means for automatically changing the message status to one of a plurality of predetermined message statuses, the one of the plurality of predetermined message statuses determined in response to the message status information,

wherein the message handling means handles the message in accordance with the one of the plurality of predetermined message statuses after the automatic changing means automatically changes the message status to the one of the plurality of predetermined message statuses.

2. The selective call receiver according to claim 1 further comprising:

indicating means coupled to the message handling means for producing an indication of the reception and storage of the message,

wherein the message handling means provides a signal to the indicating means to produce the indication if the message status corresponds to a first one of the plurality of predetermined message statuses, and

wherein the message handling means does not provide a signal to the indicating means to produce the indication if the message status corresponds to a second one of the plurality of predetermined message statuses different from the first message status.

3. The selective call receiver according to claim 1 further comprising:

display means coupled to the message handling means for displaying the stored message,

wherein the message handling means provides the message to the display means for display thereby in response to the message having a message status corresponding to a first one of the plurality of predetermined message statuses, and

wherein the message handling means does not provide the message to the display means in response to a second one of the plurality of predetermined message statuses.

4. The selective call receiver according to claim 1 further comprising user selection means for manually selecting the message status to be associated with the message prior to reception of the selective call message.

5. The selective call receiver according to claim 1 further comprising time keeping means for generating a time of day signal and wherein said means for automatically changing the message status is coupled to said time keeping means for changing the message status of the received message at a second time subsequent to the first time, the second time determined in response to the time of day signal.

6. The selective call receiver according to claim 1 wherein said receiving means includes a means for determining if the address of the selective call message matches a predetermined address; and wherein said mans for automatically changing the message status changes the message status in response to the message status information and the address of the message.

7. The selective call receiver according to claim 6 wherein the message handling means is coupled to the storing means, and wherein the message handling means stores the message if the one of the plurality of predetermined message statuses is a first message status and does not store the message if the one of the plurality of predetermined message statuses is a second message status.

8. The selective call receiver according to claim 1 wherein the means for storing stores a plurality of messages each having message status information associated therewith, 'and wherein the message handling means comprises deleting means coupled to the receiving means and the storing means for deleting one of the plurality of messages from this storing means in response to the receiving means receiving a selective call message having message status information corresponding to a message status having a value greater than a value of the message status associated with the one of the plurality of messages.

9. A method of assigning a status to a message received by a selective call receiver comprising the steps of:

receiving a selective call message comprising an address, message status information, and the message; and

automatically assigning one of a plurality of message statuses to the message for determining how the message will be handled, the one of the plurality of message statuses determined in response to the message status information.

10. The method according to claim 9 further comprising the steps of:

providing an indication signal indicating reception of the message if the one of the plurality of message statuses is determined to be a first predetermined message status; and

inhibiting said indication signal if the one of the plurality of message statuses is determined not to be the first predetermined message status.

11. The method according to claim 9 further comprising the step of:

determining a default message status from the plurality of message statuses in response to a manual input at the selective call receiver; and wherein

said step of assigning assigns the default message status to the message.

12. The method according to claim 9 wherein the step of assigning assigns a first one of the plurality of message statuses in response to the address corresponding to a first predetermined address and assigns a second one of the plurality of message statuses in response to the address corresponding to a second predetermined address.

13. The method according to claim 9 wherein said step of automatically assigning is made in response to a manual input at the selective call receiver.

14. The method according to claim 9 wherein the selective call receiver further includes a time keeping means for producing a signal indicative of the time of day, the method further comprising the step of:

determining a first default message status, a second default message status and a first time; and wherein

said step of assigning assigns the first default message status in response to the time of day signal being before the first time and assigns the second default message status in response to the time of day signal being after the first time.

15. The method according to claim 9 wherein the plurality of message statuses includes a message status indicating the message may not be deleted by a subsequent message.

16. The method according to claim 9 wherein the plurality of message statuses includes a message status indicating the message may not be stored upon reception of the message.

17. A selective call receiver comprising:

means for storing a message and a plurality of characteristics associated with the message including a current message status;

means for handling the message in accordance with the current message status; and

means for automatically changing the current message status associated with the message from a first message status to a second message status if a characteristic of the message substantially equals a predetermined characteristic.

18. The selective call receiver according to claim 17 further comprising:

clock means for generating a time signal, wherein

said changing means changes the current message status of the message in response to the time signal equaling a predetermined time.

19. The selective call receiver according to claim 18 wherein said predetermined time and said second message status are included within time and message status signals, respectively, within a selective call message comprising the message, and the selective call receiver further comprises means for decoding the time and message status signal from the selective call message for use by said changing means, whereby the plurality of characteristics of the message comprise the time and message status signals.

20. The selective call receiver according to claim 17 wherein said storing means stores a plurality of messages, the characteristic of each message having a unique signal indicative to the message associated therewith, and the predetermined characteristic includes the unique signal indicative of the message.

21. The selective call receiver according to claim 17 wherein the message includes an address signal indicative of the selective call receiver, the selective call receiver having a plurality of addresses assigned thereto, and the plurality of characteristics includes signals corresponding to the plurality of addresses and said predetermined characteristic corresponds to one of the plurality of addresses.

22. A method for changing a current message status of a message stored within a selective call receiver wherein the message is handled in accordance with the current message status thereof, the method comprising the steps of:

comparing a characteristic associated with stored messages to a first characteristic; and

automatically changing the current message status of those stored messages having an associated characteristic substantially equal to the first characteristic.

23. The method according to claim 22 further comprising the step of storing a plurality of messages having the characteristic associated therewith and a message status corresponding to each of the plurality of messages; and wherein

said step of comparing further comprises comparing the message status of the plurality of messages to a first message status; and wherein

said step of changing automatically changes the message status of messages within the plurality of messages which have the first message status corresponding thereto.

24. The method according to claim 23 wherein the first message status corresponds to a message having been read by an operator of the selective call receiver and a second message status corresponds to the message being deleted from the selective call receiver.

25. The method according to claim 23 wherein the first message status corresponds to inhibiting an indication that a message has been received an stored and a second message status enables said indication.

26. The method according to claim 22 wherein the selective call receiver has a plurality of predetermined address signals assigned thereto and the message has an address signal associated therewith matching one of the plurality of address signals, and wherein the characteristic associated with the message corresponds to said address signal.

27. The method according to claim 22 wherein said step of comparing is performed in response to a manual input made at the selective call receiver.

28. The method according to claim 22 wherein the selective call receiver further includes a time keeping means for producing a signal indicative of the time of day, further wherein said step of comparing is performed in response to the time of day signal being equal to a predetermined time.

29. A selective call receiver comprising:

means for storing a first message having a first hierarchical message priority;

means for receiving a selective call message comprising a second message;

means for automatically selecting from a plurality of hierarchical message priorities, a second hierarchical message priority for the second message;

means for generating a time of day signal;

means for changing the first hierarchical message priority in response to the time of day signal; and

means for selectively automatically deleting the first message in response to the second message having the second hierarchical message priority.

30. The selective call receiver according to claim 29 further comprising:

clock means for generating a time of day signal; and

means for changing the first hierarchical message priority in response to the time of day signal;

31. The selective call receiver according to claim 29 wherein selective call message includes the second message and a signal indicative of the hierarchical message priority of the second message and said selecting means assigns the second hierarchical message priority in response to the signal.

32. The selective call receiver according to claim 31 wherein the signal further indicates the status of the

second message and the selecting means selects the second hierarchical message priority in response to the hierarchical message priority and the status of the second message.

33. The selective call receiver according to claim 29 further comprising input means for manually inputting a user selection signal into the selective call receiver; wherein the selecting means selects the second hierarchical message priority in response to the user selection signal.

34. The selective call receiver according to claim 29 further comprising a clock means for generating a time of day signal; wherein said assigning means assigns the second hierarchical message priority in response to the time of day signal.

35. The selective call receiver according to claim 34 further comprising means for changing the first hierarchical message priority in response to the time of day signal.

36. A receiver for receiving an information signal, said information signal being formatted in one of a plurality of formats, the receiver comprising:

clock means for producing a time signal;

format selecting means for selecting a format from the plurality of formats in response to the time signal; and

means for decoding the information signal in the format selected by said format selecting means.

37. The selective call receiver according to claim 36 wherein said plurality of formats includes an alpha format and a numeric format wherein the information is formatted in ASCII and BCD formats, respectively.

38. The receiver according to claim 36 wherein an address signal precedes the information signal, the address signal selectively identifying the receiver for receiving the information signal, the receiver further comprising:

memory means for storing a predetermined address identifying the receiver;

comparison means for comparing the address signal with the predetermined address and for generating a detect signal in response to the address signal being substantially equal to the predetermined address; and wherein

said means for decoding decodes the information signal in response to the detect signal.

39. The receiver according to claim 36 further comprising:

memory means for storing a plurality of event signals and a corresponding plurality of function signals; wherein

said format selecting means comprises:

determining means for comparing the time signal with the plurality of event signals to determine if the time signal correlates with any of the plurality of event signals; and

selecting means for selecting the format in response to one of the plurality of function signals corresponding to one of the plurality of event signals correlating with the time signal.

40. The receiver according to claim 39 wherein the one of the plurality of function signals inhibits said decoding means from decoding the message.

41. The receiver according to claim 39 wherein the information includes at least one event signal and a corresponding function signal and the receiver further comprises a means for detecting the at least one event signal and corresponding function signal and for storing the at least one event signal and corresponding function signal in said memory means.

42. A selective call receiver for receiving a paging signal having an address signal, the selective call receiver comprising:

clock means for producing a time of day signal;;

memory means for storing a predetermined address and an enable time and a disable time;

receiving means for receiving and demodulating the paging signal; and

decoding means for detecting an address signal equal to the predetermined address in response to the time of day signal having a value between the enable and disable times, and for not detecting the address signal in response to the time of day signal having a value not between the disable and enable times.

43. The receiver according to claim 42 wherein said memory means stores a second predetermined address, and said decoding means further detects an address signal equal to the second predetermined address independent of the enable and disable times.

44. A selective call receiver, comprising:

means for receiving messages;

means for storing received messages and a message status associated with each received message;

means for handling stored messages in accordance with the message status associated therewith; and

means for automatically changing the message status of certain stored messages to another message status identified by a manual input means,

wherein the handling means handles the certain stored messages in accordance with the another message status after the automatic changing means automatically changes the message status thereof to the another message status.

45. A selective call receiver, comprising:

means for receiving messages and initial current message statuses associated therewith;

means for storing received messages and a current message status associated with each received message, wherein initially the current message status of received messages are the associated initial current message statuses received therewith;

means for automatically changing the current message status of certain stored messages having a characteristic identified by a manual input means; and

means for handling stored messages in accordance with the current message statuses stored therewith.

* * * * *

US005225826A

United States Patent [19]

DeLuca et al.

[11] Patent Number: 5,225,826

[45] Date of Patent: Jul. 6, 1993

[54] **VARIABLE STATUS RECEIVER**

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[73] Assignee: **Motorola, Inc.,** Schaumburg, Ill.

[21] Appl. No.: **742,220**

[22] Filed: **Aug. 6, 1991**

Related U.S. Application Data

[63] Continuation of Ser. No. 402,936, Sep. 5, 1989, abandoned.

[51] **Int. Cl.**[5] **H04B 7/00**

[52] **U.S. Cl.** **340/825.44;** 340/311.1; 340/825.47; 340/825.48

[58] **Field of Search** 340/825.44, 825.46, 340/825.47, 825.48, 309.4, 309.15, 309.5, 311.1; 455/31, 32, 38

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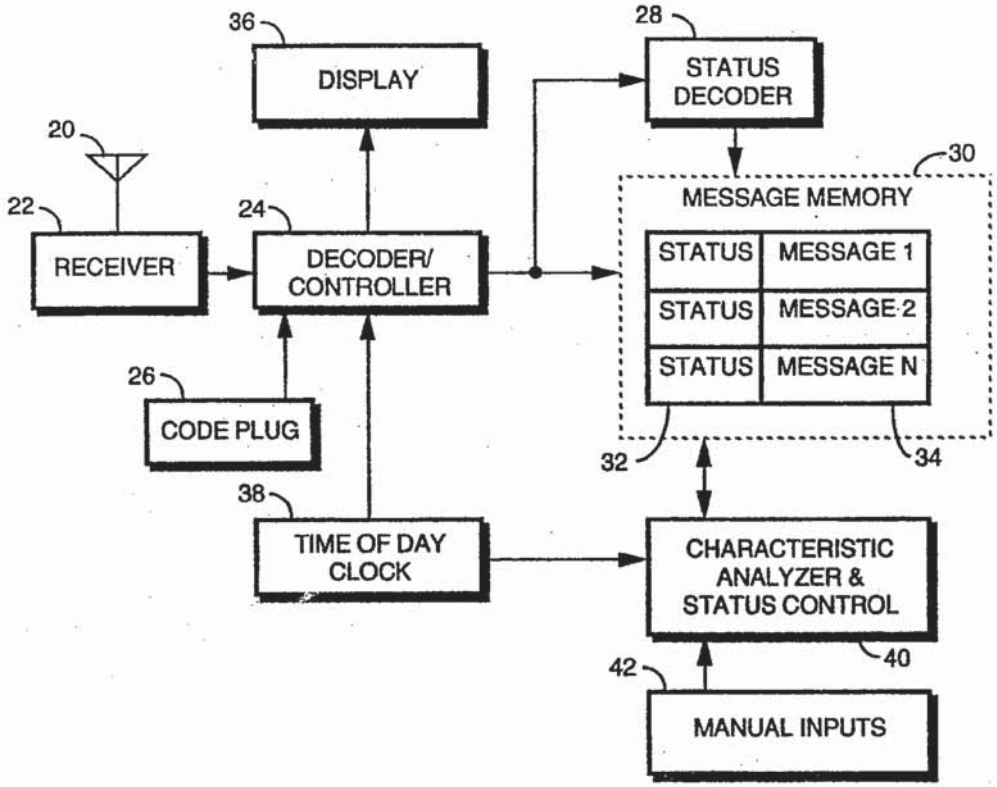
Primary Examiner—Donald J. Yusko
Assistant Examiner—Dervis Magistre
Attorney, Agent, or Firm—Daniel R. Collopy; William E. Koch; Thomas G. Berry

[57] **ABSTRACT**

A selective call receiver, such as a pager, has a real-time clock and is capable of determining the response of the receiver to a message in accordance with a status associated with that message. The selective call receiver can also change the status at a selected time or if a characteristic of the message matches a predetermined characteristic. Additionally the selective call receiver may choose from a plurality of priorities, a priority of a received message in order to determine if a message stored in the memory of the selective call receiver will be deleted by the received message. The selective call receiver is further capable of determining the type of data decoded by an address with respect to the time of day.

45 Claims, 9 Drawing Sheets



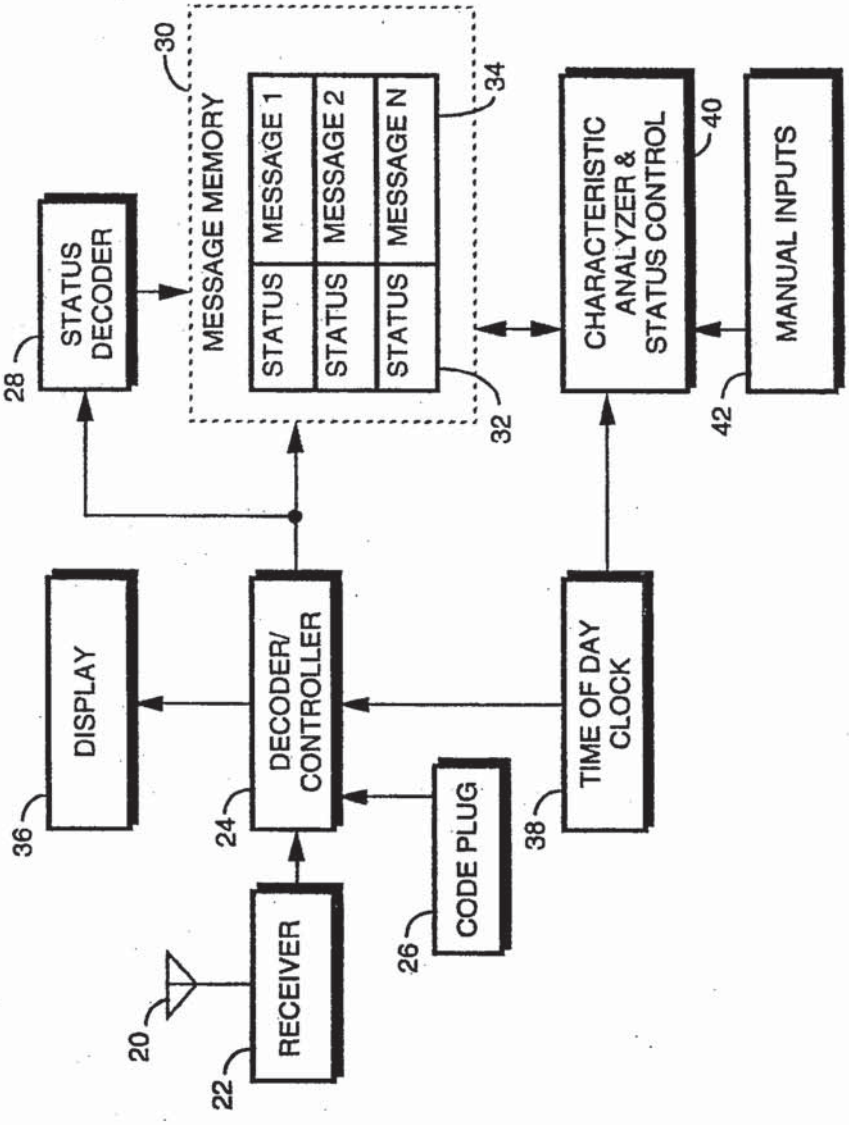

30
MESSAGE MEMORY
STATUS
MESSAGE 1
STATUS
MESSAGE 2
STATUS
MESSAGE N
34
32
STATUS DECODER
28
CHARACTERISTIC ANALYZER & STATUS CONTROL
40
MANUAL INPUTS
42
DISPLAY
36
DECODER/ CONTROLLER
24
TIME OF DAY CLOCK
38
CODE PLUG
26
RECEIVER
22
20

FIG. 1

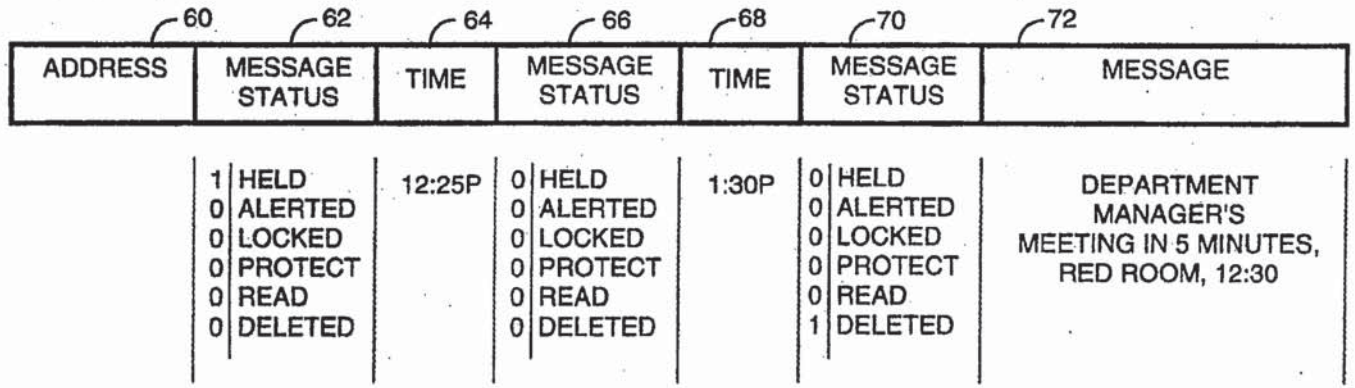

60
62
64
66
68
70
72
ADDRESS
MESSAGE STATUS
TIME
MESSAGE STATUS
TIME
MESSAGE STATUS
MESSAGE
1 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
12:25P
0 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
1:30P
0 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
1 DELETED
DEPARTMENT MANAGER'S MEETING IN 5 MINUTES, RED ROOM, 12:30

FIG. 2

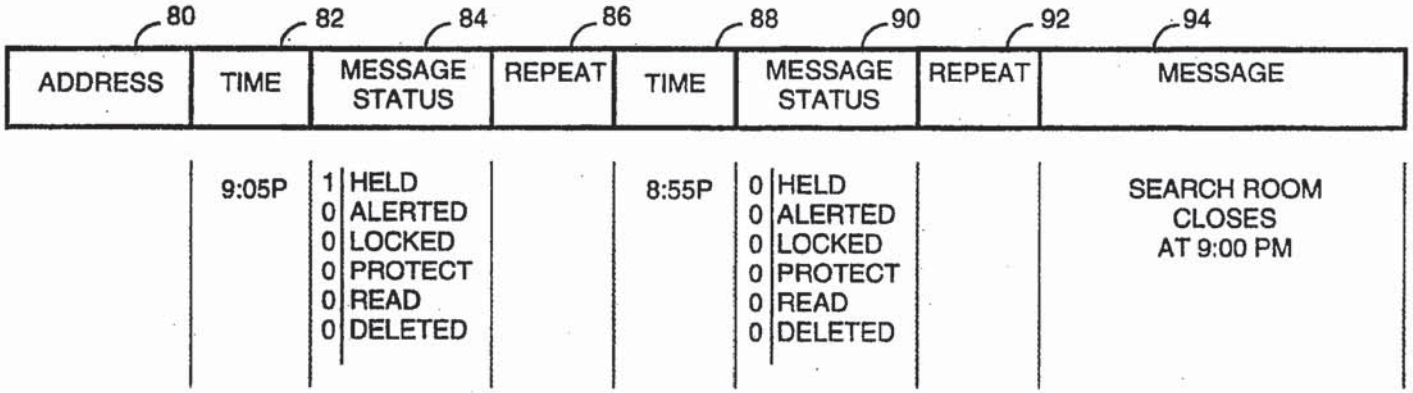

80
82
84
86
88
90
92
94
ADDRESS
TIME
MESSAGE STATUS
REPEAT
TIME
MESSAGE STATUS
REPEAT
MESSAGE
9:05P
1 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
8:55P
0 HELD
0 ALERTED
0 LOCKED
0 PROTECT
0 READ
0 DELETED
SEARCH ROOM CLOSES AT 9:00 PM

FIG. 3

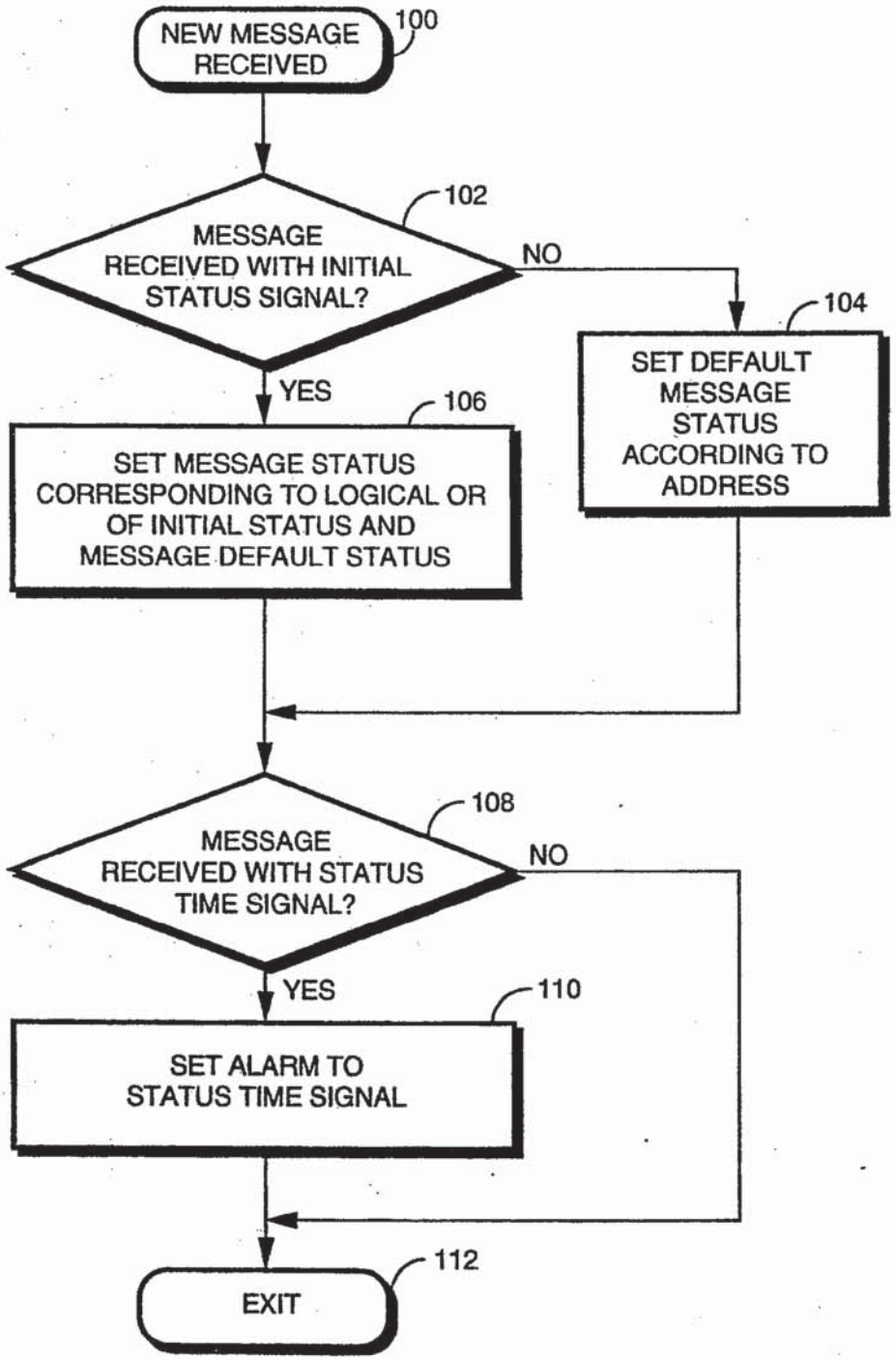

NEW MESSAGE RECEIVED
100
MESSAGE RECEIVED WITH INITIAL STATUS SIGNAL?
102
NO
YES
SET DEFAULT MESSAGE STATUS ACCORDING TO ADDRESS
104
SET MESSAGE STATUS CORRESPONDING TO LOGICAL OR OF INITIAL STATUS AND MESSAGE DEFAULT STATUS
106
MESSAGE RECEIVED WITH STATUS TIME SIGNAL?
108
NO
YES
SET ALARM TO STATUS TIME SIGNAL
110
EXIT
112

FIG. 4

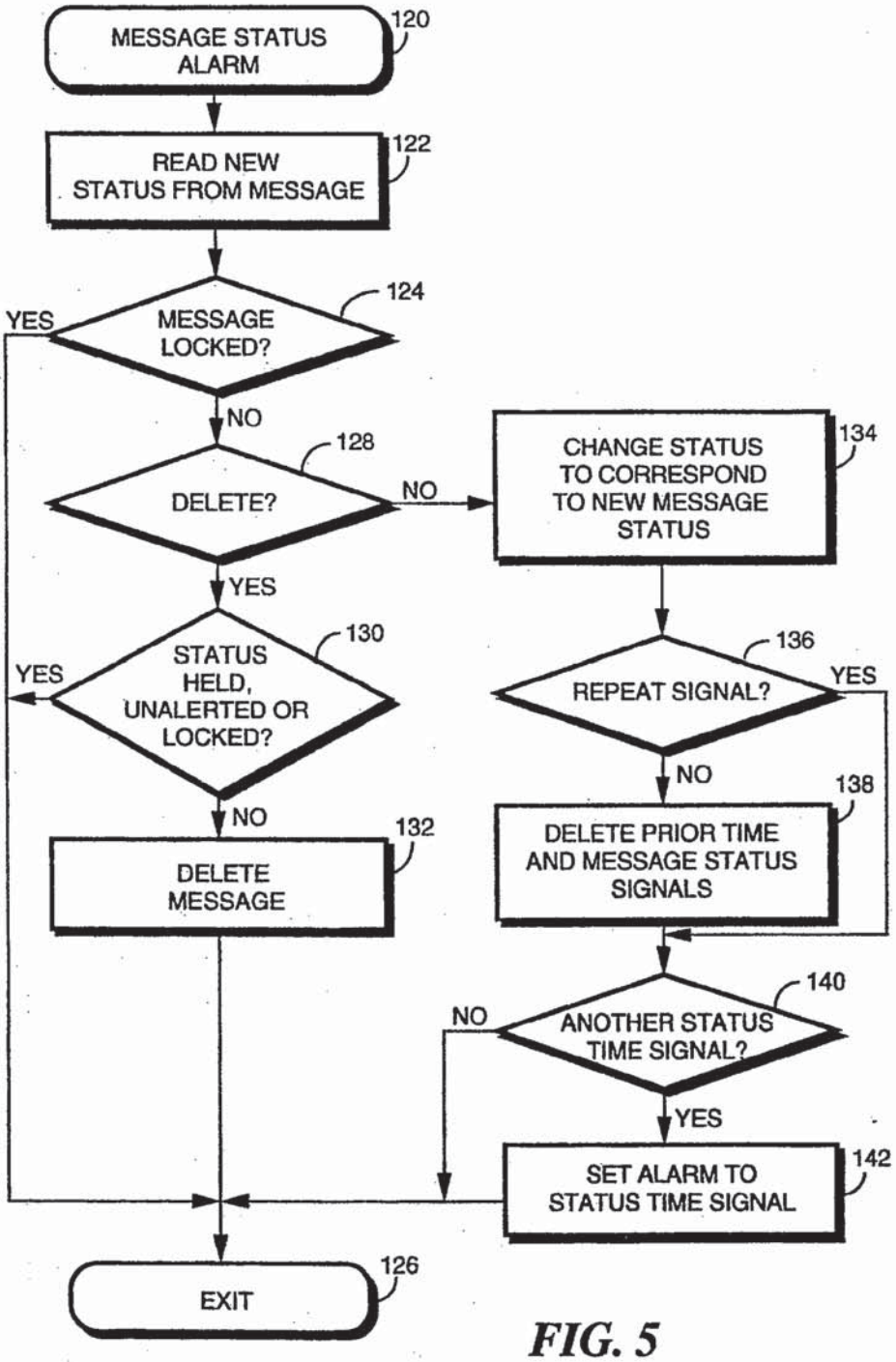

MESSAGE STATUS ALARM
120
READ NEW STATUS FROM MESSAGE
122
MESSAGE LOCKED?
124
YES
NO
DELETE?
128
NO
CHANGE STATUS TO CORRESPOND TO NEW MESSAGE STATUS
134
YES
STATUS HELD, UNALERTED OR LOCKED?
130
YES
NO
DELETE MESSAGE
132
REPEAT SIGNAL?
136
YES
NO
DELETE PRIOR TIME AND MESSAGE STATUS SIGNALS
138
ANOTHER STATUS TIME SIGNAL?
140
NO
YES
SET ALARM TO STATUS TIME SIGNAL
142
EXIT
126

FIG. 5

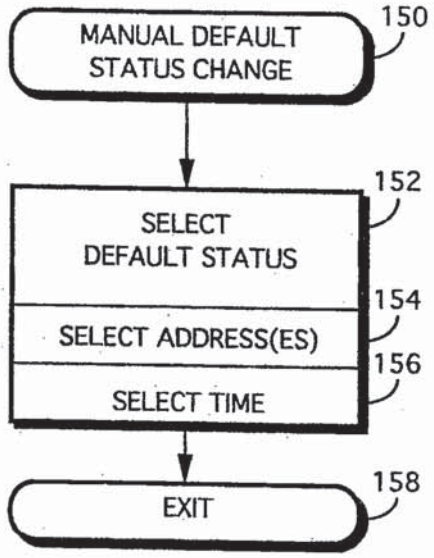


FIG. 6

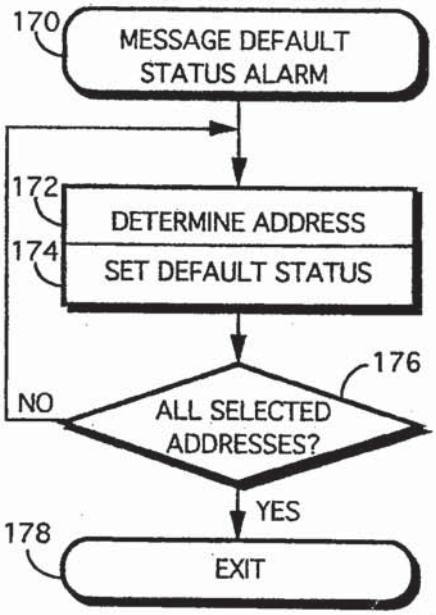


FIG. 8

	TIME	ADDDRESS	MESSAGE STATUS
162	8:00A	A & C	1 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 0 DELETED
162	10:00A	A & C	0 HELD 0 ALERTED 0 LOCKED 1 PROTECT 0 READ 0 DELETED
162	--	D	0 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 1 DELETED

FIG. 7

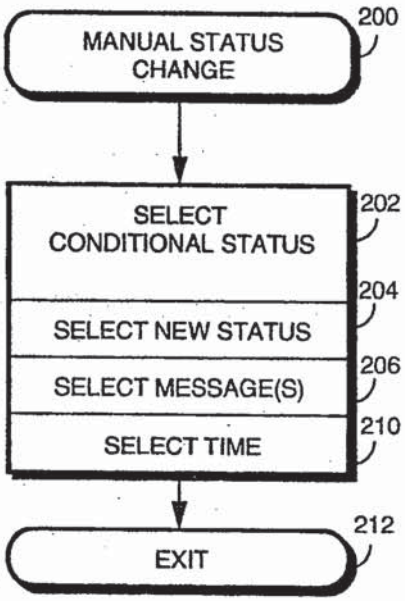

MANUAL STATUS CHANGE
200
SELECT CONDITIONAL STATUS
202
SELECT NEW STATUS
204
SELECT MESSAGE(S)
206
SELECT TIME
210
EXIT
212

FIG. 9

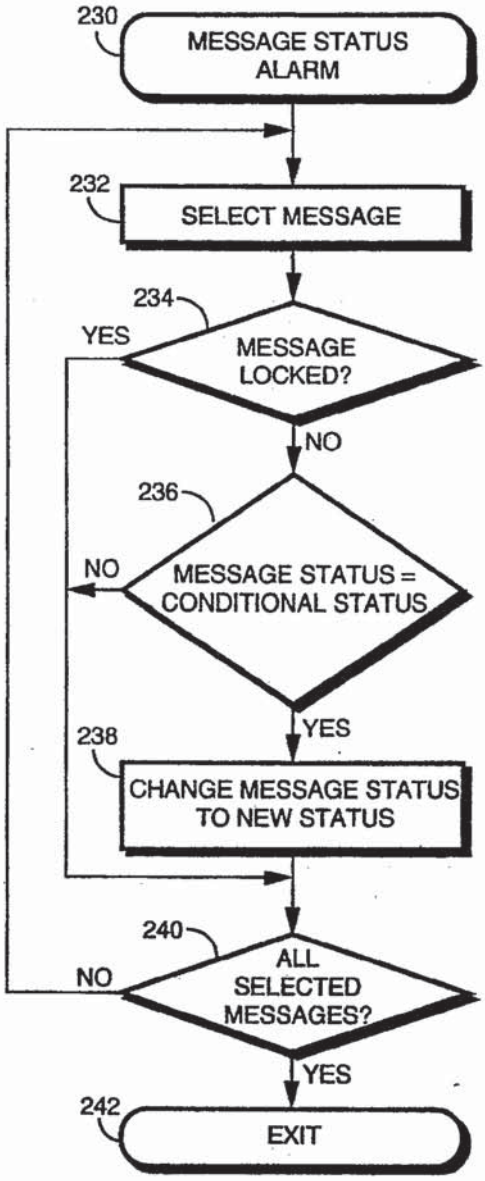

230
MESSAGE STATUS ALARM
232
SELECT MESSAGE
234
MESSAGE LOCKED?
YES
NO
236
MESSAGE STATUS = CONDITIONAL STATUS
NO
YES
238
CHANGE MESSAGE STATUS TO NEW STATUS
240
ALL SELECTED MESSAGES?
NO
YES
242
EXIT

FIG. 11

	TIME	ADDDRESS/ MESSAGE	CONDITIONAL STATUS	NEW STATUS
220	10:10A	A & C	1 HELD X ALERTED X LOCKED X PROTECT X READ X DELETED	0 HELD X ALERTED X LOCKED X PROTECT X READ X DELETED
222	5:05P	2	X HELD X ALERTED X LOCKED X PROTECT X READ X DELETED	0 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 1 DELETED
224	11:00P	ALL	0 HELD 1 ALERTED 0 LOCKED 0 PROTECT 1 READ 0 DELETED	0 HELD 0 ALERTED 0 LOCKED 0 PROTECT 0 READ 1 DELETED
226	11:30P	ALL	0 HELD 1 ALERTED 0 LOCKED 1 PROTECT 0 READ 0 DELETED	0 HELD 1 ALERTED 0 LOCKED 0 PROTECT 1 READ 0 DELETED

FIG. 10