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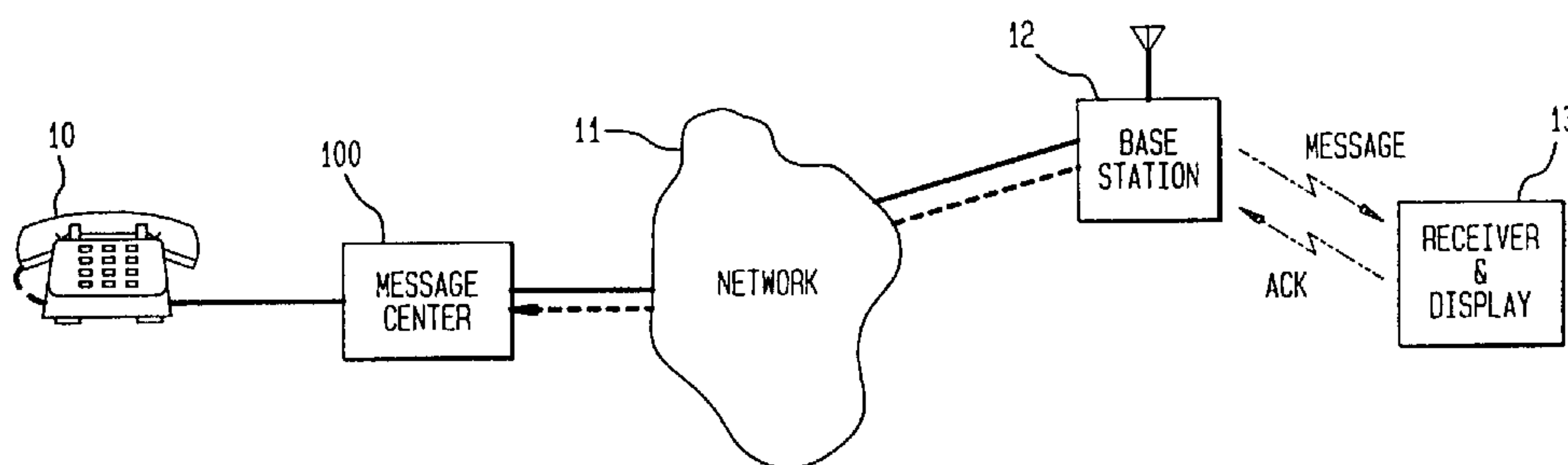
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(54) **METHODE ET APPAREIL SERVANT A VERIFIER LA  
TRANSMISSION DES MESSAGES**

(54) **A METHOD AND APPARATUS FOR MESSAGE  
TRANSMISSION VERIFICATION**



(57) L'invention est constituée par une méthode et un appareil qui améliorent la convivialité des systèmes de messagerie. L'expéditeur d'un message doit créer un numéro d'identification servant à identifier le message en question. Il peut ultérieurement, en utilisant ce numéro, demander au centre de répartition des messages de vérifier si son message a été transmis au destinataire ou s'il a été reçu par celui-ci.

(57) A method and apparatus improve the user-friendliness of messaging systems. A message sender is requested to create a message ID which is used to identify a message being sent by the message sender. At some later time the message sender can query the message center using the sender generated message ID to ask the center to verify whether the message has either been sent to or received by the intended recipient.

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10 the intended recipient.

**A METHOD AND APPARATUS FOR  
MESSAGE TRANSMISSION VERIFICATION**

**BACKGROUND OF THE INVENTION**

The present invention relates to a method and  
5 apparatus for verifying that a message has been transmitted  
to or received by an intended recipient. In particular,  
the present invention relates to the manner in which the  
message sender can access verification information.

Paging systems are well known. Generally, a sender  
10 accesses a message center and identifies the intended  
recipient of a message. The sender then provides a message  
to the center and the message is stored for subsequent  
transmission. The center then transmits the message to the  
intended recipient. In a one-way messaging system, such as  
15 in one-way paging, there is no way to determine if the  
recipient has received the message. At best, the message  
center or paging terminal can monitor whether the message  
has been transmitted. In a two-way messaging or paging  
system, two different types of acknowledgment may be  
20 received by the message center. First, a network  
acknowledgment may be received. A network acknowledgment  
signal indicates that the recipient's pager has received  
the transmitted message. A second level of acknowledgment

may be desirable where the recipient's terminal, for example, a pager transmits a message back to the message center when the recipient has accessed the message thereby providing a "read acknowledgment" to the message center.

5 It is desirable to provide the message sender with the capability of determining whether a message has been sent and received by the intended recipient.

A number of techniques for such message verification are known in the prior art. Verification techniques are provided in U.S. Patent No. 5,224,150 and, U.S. Patent No. 10 5,473,667 both to Neustein and U.S. Patent No. 5,519,718 to Yokey et al. In the two Neustein patents, both related to paging, the message sender also has a paging device and is apprised of the transmission of the paging message because 15 when the center transmits the message it sends it to both the intended recipient and the sender. When the sender receives the message this indicates to the sender that the message has been sent to the intended recipient. In the patent by Yokey et al. the messaging center places a return 20 call to the message sender after the message has been sent and a pre-recorded message is played to notify the sender of the receipt of the message by the recipient.

In another known configuration the messaging center automatically assigns a message ID number to each received 25 message. The message center then announces that message ID number to the message sender at the time the message is provided to the message center. The message sender is then advised to use the message ID to later request verification of receipt of the message by the intended recipient.

30 All of these known techniques for message verification have shortcomings. With regard to the first system

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disclosed in the Neustein patents, the message sender must have their own pager to be able to receive notice that the message has been transmitted to the intended recipient. In the system disclosed in the Yokey patent, the sender must  
5 be available at a particular location to receive the call-back information. In the system where the message center assigns a message ID, the message sender must memorialize that ID and retain that information until such time as he or she attempts to verify receipt of the message. All of  
10 these techniques make message verification a more difficult and awkward operation for the message sender. It is desirable to provide a more user-friendly technique for verifying the receipt of messages by an intended recipient.

#### **SUMMARY OF THE INVENTION**

15 In accordance with one aspect of the present invention there is provided a method in a verification system of a message center by which an originator of a message can verify receipt of the message by an intended recipient comprising the steps of: storing a message in a message  
20 database for the intended recipient; receiving an indicator from the intended recipient indicating receipt status of the message; associating the indicator of receipt status with said message; receiving a request at the verification system to verify receipt of said message, said request  
25 including said message; and analyzing said indicator of receipt status associated with said message in response to said request.

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In accordance with another aspect of the present invention there is provided a system that provides verification of receipt of a message by an intended recipient, the system comprising: a database storing a receipt status indicator associated with a message; and a processor receiving a request for receipt status of a message, said request including a message identifier created by the originator of the message, wherein said processor searches said database using said message identifier to determine receipt status of a message, wherein said message identifier includes said message.

In accordance with yet another aspect of the present invention there is provided a method in a verification system of a message center by which an originator of a message can verify transmission of the message to an intended recipient comprising the steps of: storing a message in a message database for the intended recipient; receiving an indicator from the intended recipient indicating receipt status of the message; associating an indicator of transmission status with said message; receiving a request at the verification system to verify transmission of said message, said request including said message; and analyzing said indicator of transmission status associated with said message in response to said request.

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In accordance with still yet another aspect of the present invention there is provided a system that provides verification of transmission of a message to an intended recipient, the system comprising: a database storing a  
5 transmit status indicator associated with a message; and a processor receiving a request for transmission status of a message, said request including a message identifier created by the originator of the message, wherein said processor searches said database using said message  
10 identifier to determine transmission status of a message, wherein said message identifier includes said message.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1A illustrates, in schematic form, an example of a two-way messaging system in which the present invention may be employed.

5 FIG. 1B illustrates, in block diagram form, an example of a message center of the system of FIG. 1A, in which the present invention may be employed.

FIG. 2 is a flow chart representation of the operations to be conducted by the message center in  
10 creating a message record in accordance with the present invention.

FIG. 3 illustrates an example of a message table which could be stored in the message database of FIG. 1B in accordance with the present invention.

15 FIG. 4 is a flow chart indicating the operations undertaken by the message center in monitoring the receipt of a message by the intended recipient.

FIG. 5 provides a flow chart describing the steps performed by the message center to verify to the message  
20 sender receipt of a message by the intended recipient in accordance with an embodiment of the present invention.

FIG. 6 is a flow chart that describes a second embodiment of the present invention for verifying message receipt of the message by the intended recipient.

**25 DETAILED DESCRIPTION**

The present invention may be employed in various messaging systems. The following description refers to a two-way paging system. But this is intended to be an example only. The invention is also applicable in

messaging systems that provide Short Message Service (SMS) messages.

An example of a two-way paging system in which the present invention can be employed is illustrated in FIG. 1A. A message sender can operate telephone 10 to access message center 100. The connection to the message center could be either by the Public Switch Telephone Network (PSTN) or by wireless communication (e.g., cellular). As described in detail below, the message center 100 prompts the message sender for entry of relevant message related information. Upon completion of receipt of the message the center terminates the connection to the message sender. The message center subsequently sends a message out through network 11 to a base station 12 where the message is transmitted over the air to a device such as a pager 13, which includes a receiver and a display. The pager 13 also has the capability of sending back at least an acknowledgment that the message has been received by the pager. The network acknowledgment signal (represented as Ack in the drawing figure) is transmitted to the base station. The base station then transfers this network acknowledgment to the message center. The message center then associates the network acknowledgment with the transmitted message.

An example of the elements which could be included in the message center 100 is illustrated in FIG. 1B. The center could include a communication interface 101 which provides access to the PSTN for connection to the message sender as well as access to the network 11 for transmitting the message to the pager 13. A subscriber database 102 includes information about the parties subscribing to the

5 paging service, including subscriber ID information. A read-only memory (ROM) 103 stores the programs that control the operation of the message center. A message database 104 stores the messages received from message senders as well as acknowledgment information transmitted back to the message center by the recipients (the transmission path shown by the dashed lines in FIG. 1A). The center also includes a CPU 105 that controls the communication interface and controls accesses to the subscriber database and message database. The programs stored in the ROM can define the operations of the CPU. Those stored programs incorporate the techniques described in the flow charts shown in FIGS. 2 and 4 to 6 so as to provide a more user-friendly interface to a message sender who is interested in determining whether a message has been received by the intended recipient.

10 FIG. 2 is a flow chart that illustrates the operations that can be performed by the message center to register a message and associate a user generated message ID with the message. First, the message center receives a request to leave a message from a message sender, step 201. Next, the message center prompts the message sender to provide subscriber information, step 202. The message sender can be asked to either enter the ID information via touch tone signaling on a telephone keypad or by speaking the subscriber identification information. The message center then receives the subscriber ID, step 203. In that regard the communication interface 101 of FIG. 2 must be able to accept the received subscriber information and recognize it. Thus, in connection with the examples given the interface must either recognize DTMF signaling or must

provide speech recognition. After receiving the subscriber ID, the message center prompts the sender for the message, step 204. As before, the message can be entered either by DTMF signaling or by voice. The message center then  
5 receives the message, for example, 990-XXXX, and stores the message in a message database (104 FIG. 1B), step 205. The message center then prompts the sender to provide a message ID, step 206. The message center, upon receipt of the message ID generated by a message sender, associates the  
10 message ID with the message, step 207. The center then sets a message status indicator associated with the message so as to indicate that transmission of the message is pending, step 208.

An example of the information stored in the message  
15 database is illustrated in tabular form in FIG. 3. Each line of the table could be considered a message separate entry. Each entry would be constituted by a plurality of fields of information. A first field, 301 stores subscriber ID information. A second field, 302, stores the  
20 message. A third field, 303, stores the message ID generated and supplied by the message sender. A fourth field, 304, stores an indication of the status of the receipt of the message. In the example shown in FIG. 3, ``0'' is used to represent that the message has not yet  
25 been received by the recipient. The notation ``1'' indicates that the associated message has been received by the recipient, that is a network acknowledgment has been received.

In an alternative configuration the message status  
30 indicator could indicate that the message has been transmitted by the message center rather than indicate

receipt of the message by the recipient. In such a case, the status indicator would not rely upon receipt of any acknowledgment signals at the message center. The remainder of this description refers to verifying receipt  
5 of the message by the intended recipient. However, one skilled in the art would recognize that these principles are applicable to systems where the center only monitors whether the message has been sent.

FIG. 3 is only one example of a potential format for a  
10 message database structure. The invention is not limited to this format. Furthermore, the invention is not limited to the specific order of prompting and receiving information illustrated in FIG. 2. For instance, after receiving the subscriber ID, the message center could  
15 prompt the sender to provide a message ID prior to providing the message itself.

In yet another modification in accordance with the present invention, instead of prompting for a separate message ID, the message center can treat the entered  
20 message itself as the message ID. This would avoid the need for performing steps 206 and 207 of FIG. 2. So long as the message center treats the message itself as the message ID it will be capable of doing the necessary scanning of the database to determine message status as  
25 described in connection with the flowcharts of FIGS. 5 and 6.

FIG. 4 is a flowchart that generally describes the operation of the message center in tracking the status of the message. First, the message center transmits the  
30 message to the intended recipient, step 401. The center then detects whether a network acknowledgment has been

received, step 402. If such an acknowledgment has been received, then the recipient is presumed to have received the message and in step 403 the center resets the message status indicator to indicate that the message has been sent  
5 and received. In the example shown in FIG. 3, for instance, entry 31 indicates that the message has not as yet been received by the intended recipient. However, if the center receives an acknowledgment that the message has been received then the message status indicator would be  
10 changed from ``0" to ``1". If after transmission of the message the center does not receive the network acknowledgment then a counter can be incremented so as to effect the operation of a timer. When the elapsed time since the last transmission attempt exceeds a predetermined  
15 time period that corresponds to counter value ``x" then the center again attempts to transmit the message to the intended recipient, returning to step 401.

In accordance with the present invention, the message sender can re-access the message center to obtain  
20 information about whether the message has been received by the intended recipient. Two such message verification schemes are described in connection with FIGS. 5 and 6 respectively.

In a first verification scheme, the message center  
25 receives a request for message transmission status information, step 501. Such a request could be entered by a user in response to a prompt to identify whether the user wishes to send a message or to verify receipt of a message.

Once the request is received the center prompts the user  
30 to provide the subscriber ID and message ID information associated with the message of interest, step 502.

Subsequently, the center receives this information, step 503 and examines the message status indicator for the message associated with the subscriber ID and message ID supplied, step 504. This examination requires a scanning  
5 of the message database to locate the message of interest and then an examination of the message status indicator associated with that message to determine ``received'' status. Once the status indicator is examined, the center reports the status to the user who is seeking the  
10 information, step 505.

In an alternative embodiment the caller to the message center is not greeted by a decision tree that asks whether the caller is interested in sending a message or verifying a message. Instead, the message center automatically  
15 determines whether a verification operation should be conducted and when necessary does so. This operation is described with reference to FIG. 6. In such a configuration the message center treats a call initially as a request to leave a message and performs steps 201 to 206  
20 of FIG. 2. Then, having received all of the information necessary to identify a particular message, the center scans the message table, 601 looking for the message in question. If the subscriber ID/message ID combination is not found in the message table as tested in step 602, then  
25 the message center goes to step 207 of FIG. 2 and the call is treated as a request to send the message. If, however, the message table does contain this subscriber ID/message ID combination then the center determines the amount of time that has elapsed since the message has been entered  
30 into that system. This can be done by time stamping the message as it is first received and then comparing that

time step to the time the later access occurs. If the time elapsed has exceeded some predetermined value then the system automatically assumes that the call is a request to send a new message and is not related to the earlier  
5 message. The system under those circumstances goes directly to step 207 of FIG. 2 and performs no verification. If, however, the elapsed time is less than the predetermined time then the system treats the call as an attempt to verify the receipt of the previously provided  
10 message. Thus, the center examines the message status indicator for the received subscriber ID/message ID combination, step 606. The system detects whether the indicator has been reset such as would occur when the message center receives a network acknowledgment (see steps  
15 402 and 403 of FIG. 4). If the indicator has been reset then the center reports to the user that the previous message has been sent and then asks if the message should be re-sent, step 608. If the indicator has not been re-set then the center can advise the sender that it is prepared  
20 to transmit the message to the intended recipient, step 609. In the latter circumstance, it is up to the discretion of the message center as to whether it is necessary to inform the user that the message has not already been sent.

25 The above described message verification system provides enhanced accessibility to message senders. The system permits the sender to place a request for information about a message at any time and allows the user to define the information necessary to identify a  
30 particular message within the message database. This avoids the generation of message ID's at the message center

and also avoids the potential problem of the message sender failing to maintain the message identification information generated by the message center.

The present invention could be utilized in  
5 environments other than the paging environment where message databases receive messages from message senders and subsequently transmit those messages to intended recipients since the invention would provide an easy way for the message sender to verify the receipt by (or transmission  
10 to) the intended recipient.

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**CLAIMS:**

1. A method in a verification system of a message center by which an originator of a message can verify receipt of the message by an intended recipient comprising  
5 the steps of:
  - storing a message in a message database for the intended recipient;
  - receiving an indicator from the intended recipient indicating receipt status of the message;
  - 10 associating the indicator of receipt status with said message;
  - receiving a request at the verification system to verify receipt of said message, said request including said message; and
  - 15 analyzing said indicator of receipt status associated with said message in response to said request.
2. The method of claim 1 wherein the step of analyzing said indicator of receipt status includes examining the value of the indicator of receipt status to  
20 determine if the message has been received.
3. A system that provides verification of receipt of a message by an intended recipient, the system comprising:
  - a database storing a receipt status indicator associated with a message; and

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a processor receiving a request for receipt status of a message, said request including a message identifier created by the originator of the message, wherein said processor searches said database using said message  
5 identifier to determine receipt status of a message, wherein said message identifier includes said message.

4. A method in a verification system of a message center by which an originator of a message can verify transmission of the message to an intended recipient  
10 comprising the steps of:

storing a message in a message database for the intended recipient;

receiving an indicator from the intended recipient indicating receipt status of the message;

15 associating an indicator of transmission status with said message;

receiving a request at the verification system to verify transmission of said message, said request including said message; and

20 analyzing said indicator of transmission status associated with said message in response to said request.

5. The method of claim 4 wherein the step of analyzing said indicator of receipt status includes examining the value of the indicator of receipt status to  
25 determine if the message has been received.

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6. A system that provides verification of transmission of a message to an intended recipient, the system comprising:

5 a database storing a transmit status indicator associated with a message; and

10 a processor receiving a request for transmission status of a message, said request including a message identifier created by the originator of the message, wherein said processor searches said database using said message identifier to determine transmission status of a message, wherein said message identifier includes said message.

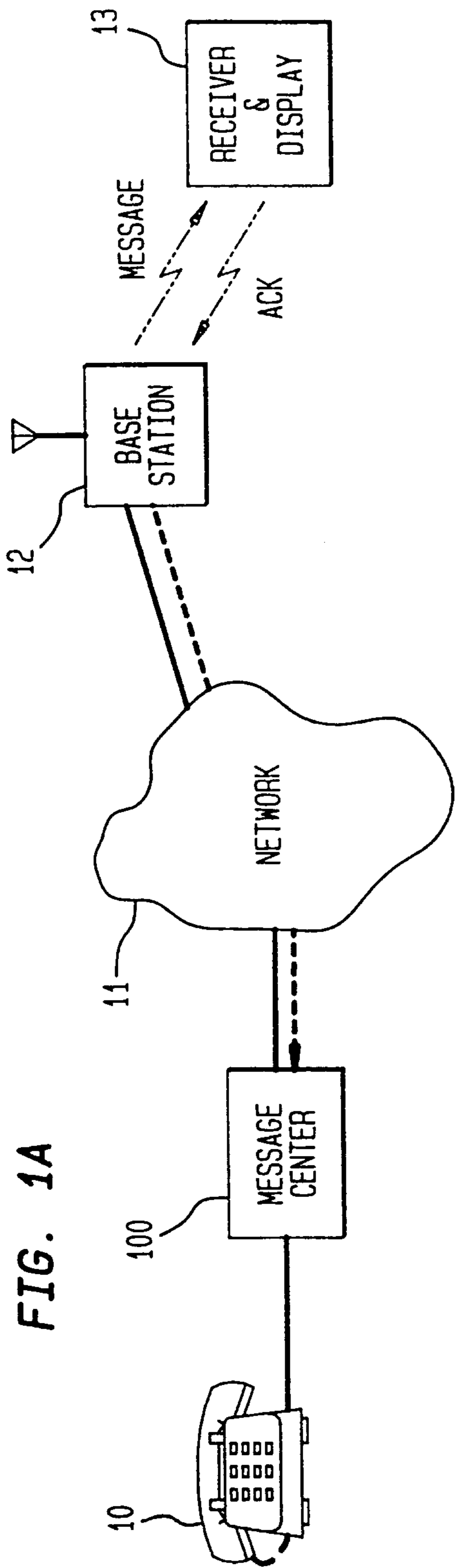
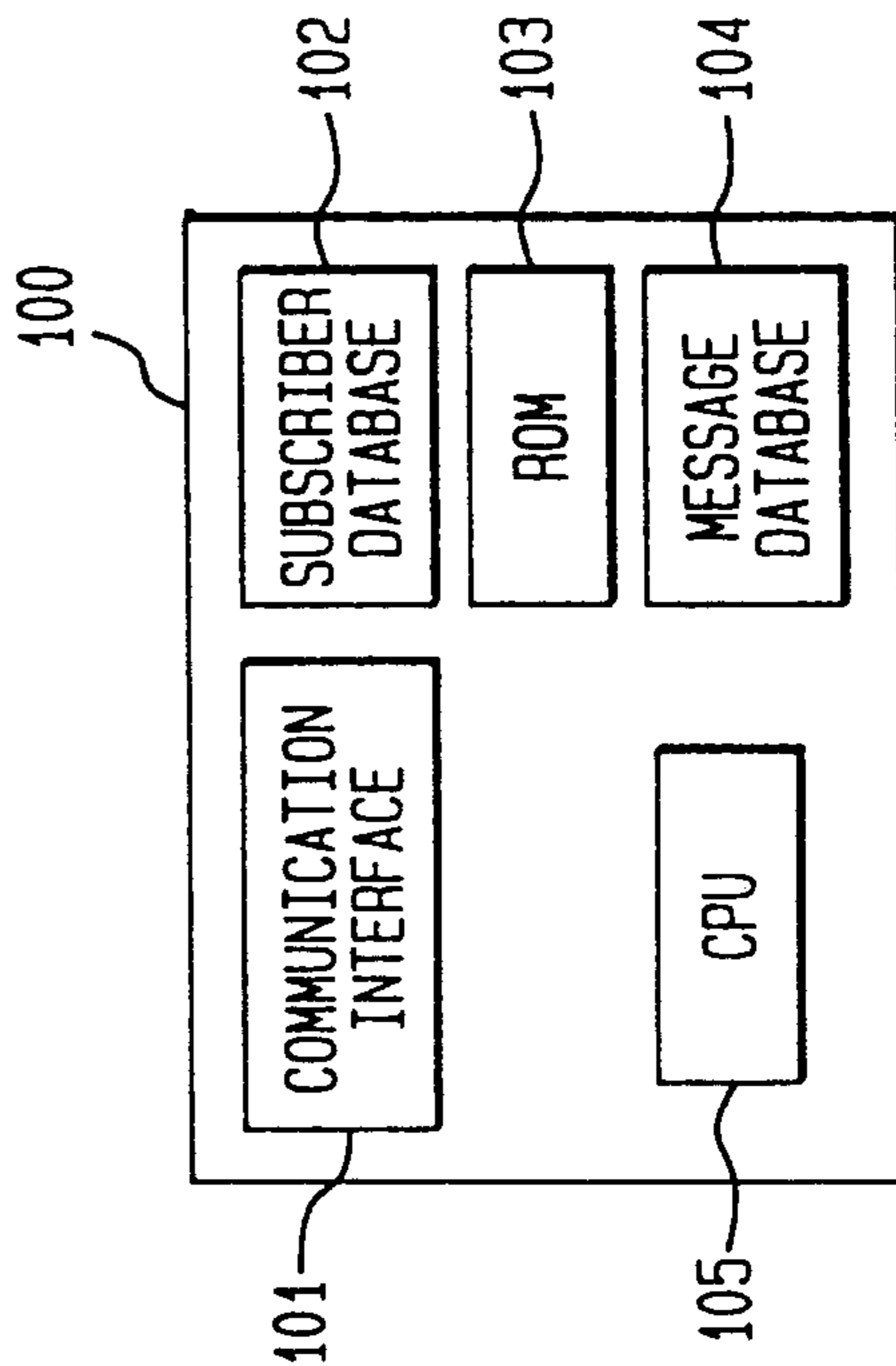


FIG. 1A

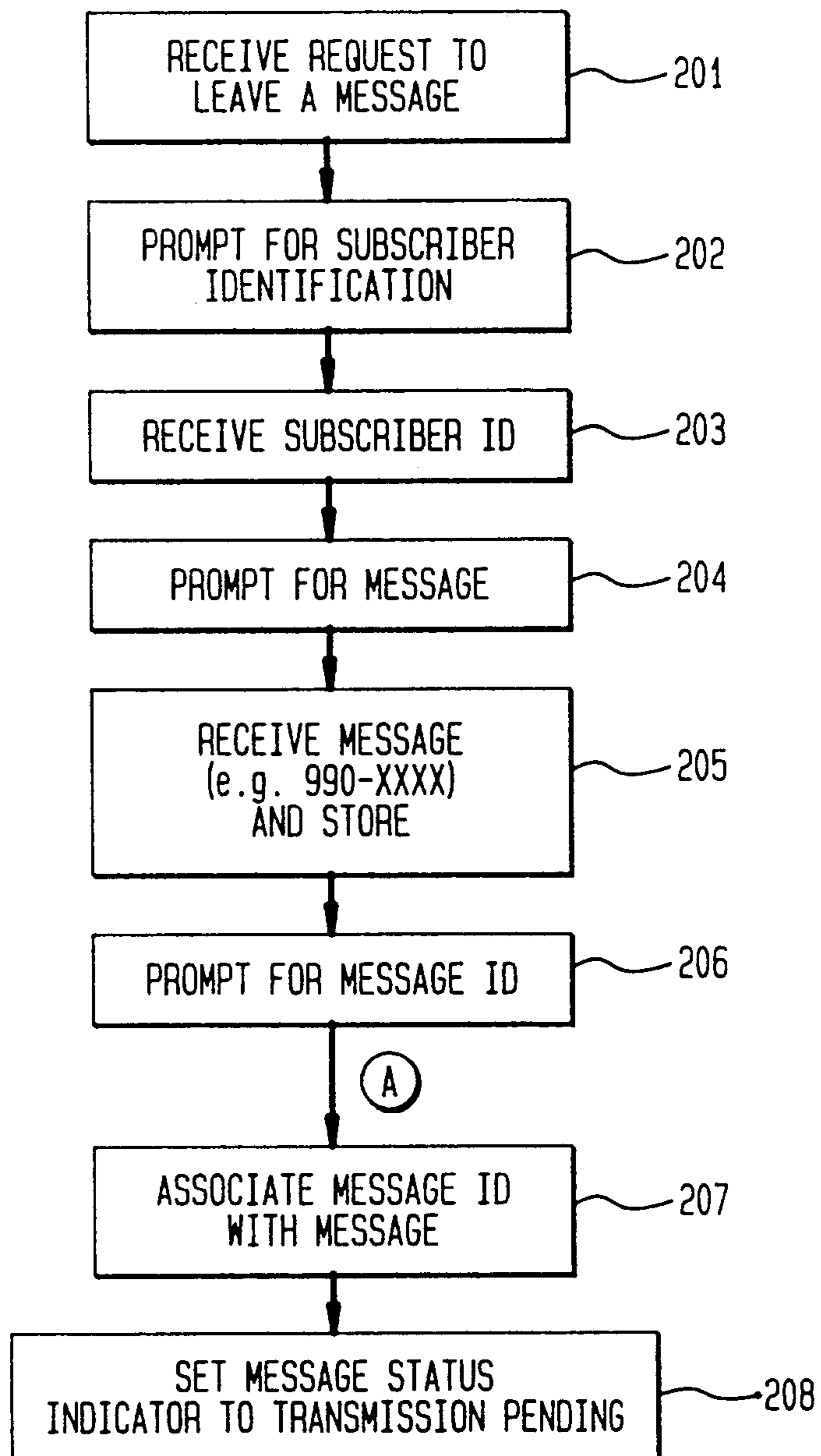
FIG. 1B



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FIG. 2



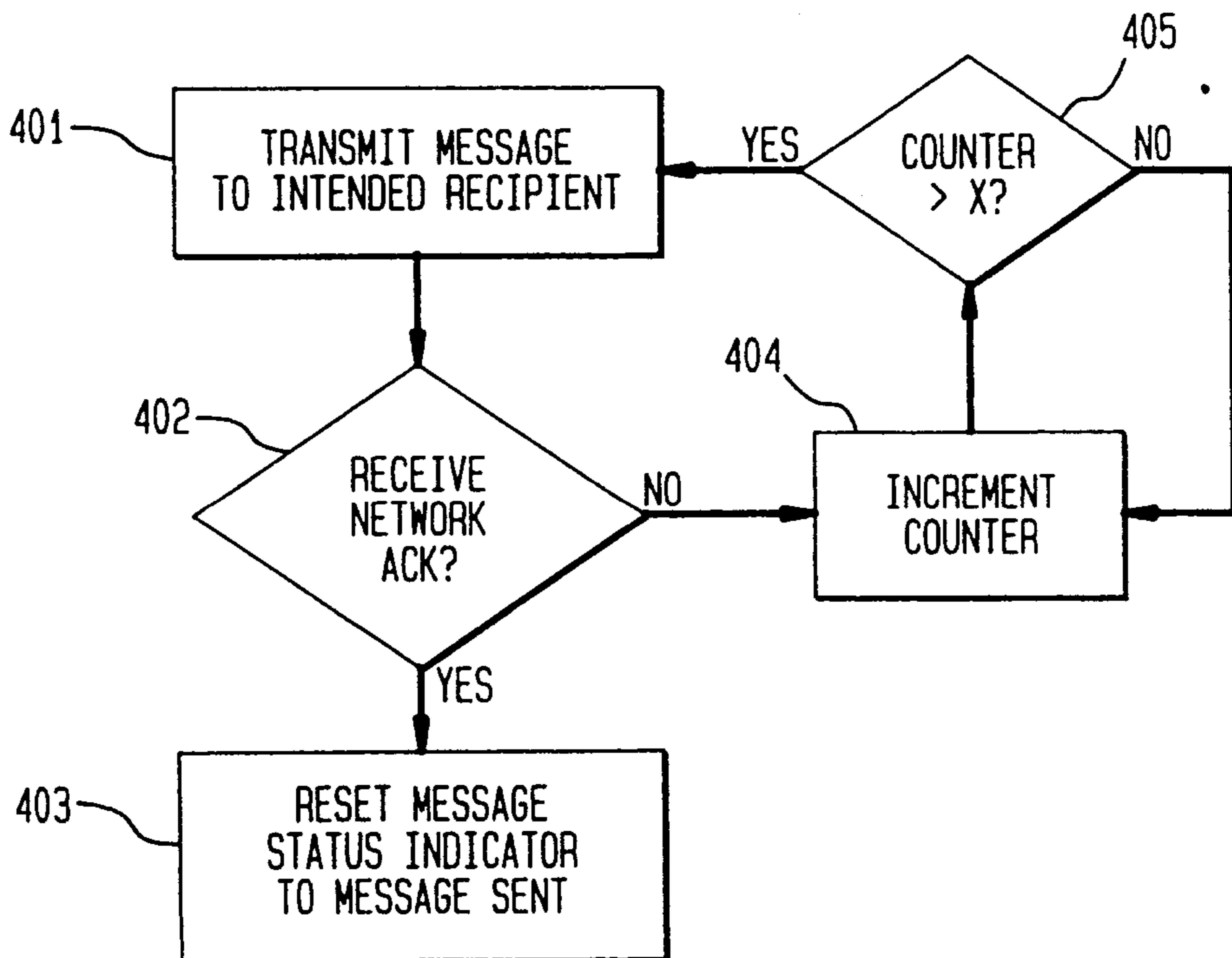
D. AAS 1-7

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FIG. 3

SUBSCRIBER ID	MESSAGE	MESSAGE ID	MESSAGE STATUS INDICATOR
ABCD1234	XXX-XXXX	YYYY	0
ABCD1234	NNN-NNNN	LLLL	1
⋮	⋮	⋮	⋮

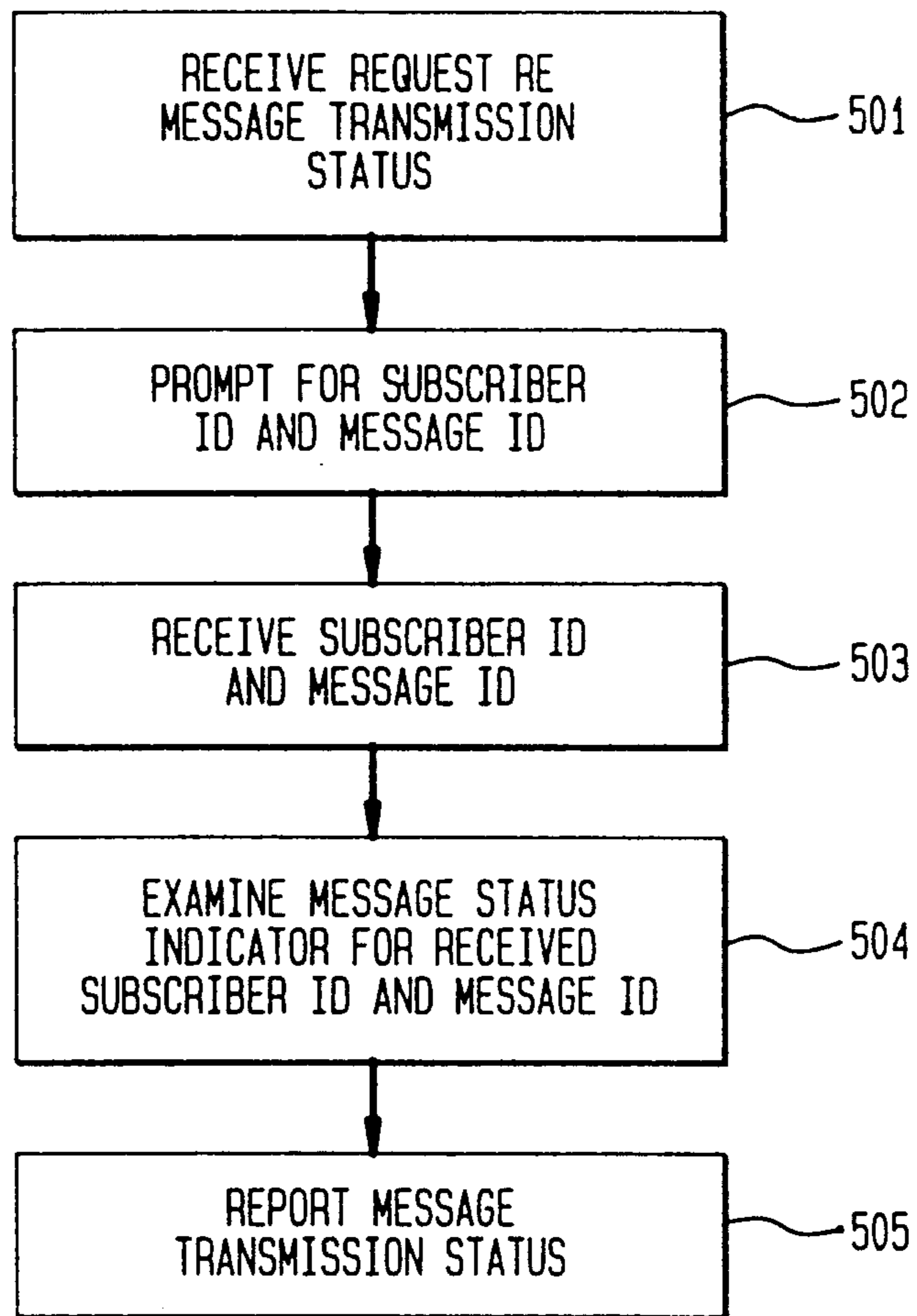
FIG. 4



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**FIG. 5**



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FIG. 6

