EXHIBIT A

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IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF TEXAS

TYLER DIVISION

STRAGENT, LLC and SEESAW FOUNDATION,	§	
	§	**Civil Action No. 6:10-CV-242-LED**
Plaintiffs,	§	
v.	§	
	§	**JURY TRIAL DEMANDED**
CLASSMATES ONLINE, INC., *et al.,*	§	
Defendants.	§	

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which Plaintiffs Stragent, LLC ("Stragent") and SeeSaw Foundation ("SeeSaw") complain against Defendants Classmates Online, Inc., Classmates Media Corporation, and United Online, Inc. (collectively "Classmates"); Gannett Co., Inc. ("Gannett"); MTV Networks, a division of Viacom International, Inc., and Viacom Inc. (collectively "MTV"); MyLife.com, Inc. ("MyLife"); MySpace, Inc. ("MySpace"); and Plaxo, Inc. ("Plaxo"), as follows:

PARTIES

1. Plaintiff Stragent is a Texas limited liability company having its principal place of business in Longview, Texas.

2. Plaintiff SeeSaw is a Texas non-profit corporation intended to qualify as an entity exempt from income tax as an organization described in Internal Revenue Code section 501(c)(3) and as a supporting organization described in Internal Revenue Code section 509(a)(3)(B)(i) (a "Type 1 Supporting Organization") to SeeSaw Children's Place, a Texas non-

profit corporation exempt from income tax under section 501(c)(3) of the Internal Revenue Code, having its principal place of business in Longview, Texas.

3. On information and belief, Defendant Classmates Online, Inc. is a Washington corporation having its principal place of business in Renton, Washington.

4. On information and belief, Defendant Classmates Media Corporation is a Delaware corporation having its principal place of business in Seattle, Washington.

5. On information and belief, Defendant United Online, Inc. is a Delaware corporation having its principal place of business in Woodland Hills, California.

6. On information and belief, Defendant Classmates Online, Inc. is subsidiary of Defendant Classmates Media Corporation, which is a wholly owned subsidiary of Defendant United Online, Inc.

7. On information and belief, Defendant Gannett is a Delaware corporation having its principal place of business in McLean, Virginia.

8. On information and belief, Defendant MTV Networks is an unincorporated division of Viacom International, Inc., which is a Delaware corporation having its principal place of business in New York, New York.

9. On information and belief, Defendant Viacom Inc. is a Delaware corporation having its principal place of business in New York, New York.

10. On information and belief, Defendant MTV Networks is an unincorporated division of Viacom International, Inc., which is a subsidiary of Defendant Viacom Inc.

11. On information and belief, Defendant MyLife is a Delaware corporation having its principal place of business in Santa Monica, California.

12. On information and belief, Defendant MySpace is a Delaware corporation having its principal place of business in Los Angeles, California.

13. On information and belief, Defendant Plaxo is a Delaware corporation having its principal place of business in Mountain View, California.

JURISDICTION AND VENUE

14. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

15. Venue is proper in this district under 28 U.S.C. §§ 1391(c) and 1400(b). On information and belief, each Defendant has transacted business in this district and has committed and/or contributed to acts of patent infringement in this district.

16. On information and belief, each Defendant is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the Texas Long Arm Statute, due at least to its substantial business in this forum, directly or through intermediaries, including: (i) at least a portion of the infringements alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Texas and in this Judicial District.

INFRINGEMENT OF U.S. PATENT NO. 6,665,722

17. Plaintiff SeeSaw is the owner by assignment of United States Patent No. 6,665,722 ("the '722 patent") entitled "Store-and-forward packet radio system and method." The '722 patent was duly and legally issued on December 16, 2003. A true and correct copy of the '722 patent is attached as Exhibit A.

18. Plaintiff Stragent is the exclusive licensee of the '722 patent, having an exclusive, worldwide, transferable, retroactive and prospective license ("the License") under the '722

patent, with the right to sublicense others, to (i) make, have made, use, sell, offer to sell, import and lease any products, (ii) use and perform any method, process, and/or services, and (iii) otherwise practice any invention in any manner, such that Stragent has full right to enforce and/or sublicense the '722 patent without any restriction, subject to certain encumbrances. Stragent further has the exclusive right under the License to maintain, enforce, or defend the '722 patent, including without limitation pursuing and collecting damages, royalties, and other payments and obtaining injunctive relief and other remedies for past, current and future infringement of the '722 patent and pursuing and entering into any settlement related to a claim of infringement.

19. On information and belief, Defendant Classmates has been and now is, directly or through intermediaries, directly infringing the '722 patent in the State of Texas, in this judicial district, and elsewhere in the United States. Classmates's direct infringements include, without limitation, making, using, offering for sale and/or selling within the United States, and/or importing into the United States, communication systems, including without limitation the Classmates.com Internet website, that infringe one or more claims of the '722 patent. Classmates is thus liable for infringement of the '722 patent pursuant to 35 U.S.C. § 271.

20. On information and belief, Defendant Classmates has been and now is, directly or through intermediaries, contributing to infringement of the '722 patent by, for example, end users of communication systems, including without limitation the Classmates.com Internet website, that infringe one or more claims of the '722 patent. Classmates is thus liable for further infringement of the '722 patent pursuant to 35 U.S.C. § 271.

21. On information and belief, Defendant Gannett has been and now is, directly or through intermediaries, directly infringing the '722 patent in the State of Texas, in this judicial

district, and elsewhere in the United States. Gannett's direct infringements include, without limitation, making, using, offering for sale and/or selling in the United States, and/or importing into the United States, communication systems, including without limitation the USAToday.com Internet website, that infringe one or more claims of the '722 patent. Gannett is thus liable for infringement of the '722 patent pursuant to 35 U.S.C. § 271.

22. On information and belief, Defendant Gannett has been and now is, directly or through intermediaries, contributing to infringement of the '722 patent by, for example, end users of communication systems, including without limitation the USAToday.com Internet website, that infringe one or more claims of the '722 patent. Gannett is thus liable for further infringement of the '722 patent pursuant to 35 U.S.C. § 271.

23. On information and belief, Defendant MTV has been and now is, directly or through intermediaries, directly infringing the '722 patent in the State of Texas, in this judicial district, and elsewhere in the United States. MTV's direct infringements include, without limitation, making, using, offering for sale and/or selling within the United States, and/or importing into the United States, communication systems, including without limitation the MTV.com and VH1.com Internet websites, that infringe one or more claims of the '722 patent. MTV is thus liable for infringement of the '722 patent pursuant to 35 U.S.C. § 271.

24. On information and belief, Defendant MTV has been and now is, directly or through intermediaries, contributing to infringement of the '722 patent by, for example, end users of communication systems, including without limitation the MTV.com and VH1.com Internet websites, that infringe one or more claims of the '722 patent. MTV is thus liable for further infringement of the '722 patent pursuant to 35 U.S.C. § 271.

25. On information and belief, Defendant MyLife has been and now is, directly or through intermediaries, directly infringing the '722 patent in the State of Texas, in this judicial district, and elsewhere in the United States. MyLife's direct infringements include, without limitation, making, using, offering for sale and/or selling within the United States, and/or importing into the United States, communication systems, including without limitation the Reunion.com Internet website, that infringe one or more claims of the '722 patent. MyLife is thus liable for infringement of the '722 patent pursuant to 35 U.S.C. § 271.

26. On information and belief, Defendant MyLife has been and now is, directly or through intermediaries, contributing to infringement of the '722 patent by, for example, end users of communication systems, including without limitation the Reunion.com Internet website, that infringe one or more claims of the '722 patent. MyLife is thus liable for further infringement of the '722 patent pursuant to 35 U.S.C. § 271.

27. On information and belief, Defendant MySpace has been and now is, directly or through intermediaries, directly infringing the '722 patent in the State of Texas, in this judicial district, and elsewhere in the United States. MySpace's direct infringements include, without limitation, making, using, offering for sale and/or selling within the United States, and/or importing into the United States, communication systems, including without limitation the MySpace.com Internet website, that infringe one or more claims of the '722 patent. MySpace is thus liable for infringement of the '722 patent pursuant to 35 U.S.C. § 271.

28. On information and belief, Defendant MySpace has been and now is, directly or through intermediaries, contributing to infringement of the '722 patent by, for example, end users of communication systems, including without limitation the MySpace.com Internet

website, that infringe one or more claims of the ‘722 patent. MySpace is thus liable for further infringement of the ‘722 patent pursuant to 35 U.S.C. § 271.

29. On information and belief, Defendant Plaxo has been and now is, directly or through intermediaries, directly infringing the ‘722 patent in the State of Texas, in this judicial district, and elsewhere in the United States. Plaxo’s direct infringements include, without limitation, making, using, offering for sale and/or selling within the United States, and/or importing into the United States, communication systems, including without limitation the Plaxo.com Internet website, that infringe one or more claims of the ‘722 patent. Plaxo is thus liable for infringement of the ‘722 patent pursuant to 35 U.S.C. § 271.

30. On information and belief, Defendant Plaxo has been and now is, directly or through intermediaries, contributing to infringement of the ‘722 patent by, for example, end users of communication systems, including without limitation the Plaxo.com Internet website, that infringe one or more claims of the ‘722 patent. Plaxo is thus liable for further infringement of the ‘722 patent pursuant to 35 U.S.C. § 271.

31. As a result of Defendants’ infringement of the ‘722 patent, Stragent and SeeSaw have suffered monetary damages that are adequate to compensate them for the infringement under 35 U.S.C. § 284, but in no event less than a reasonable royalty.

PRAYER FOR RELIEF

WHEREFORE, Stragent and SeeSaw request that this Court enter:

A. A judgment in favor of Stragent and SeeSaw that Defendants have directly infringed the ‘722 patent;

B. A judgment in favor of Stragent and SeeSaw that Defendants have contributed to others’ infringement of the ‘722 patent;

C. A judgment and order requiring Defendants to pay Stragent and SeeSaw their damages, costs, expenses, prejudgment and post-judgment interest, and post-judgment royalties for Defendants' infringement of the '722 patent as provided under 35 U.S.C. § 284; and

D. Any and all other relief to which the Court may deem Stragent and SeeSaw entitled.

DEMAND FOR JURY TRIAL

Stragent and SeeSaw, under Rule 38 of the Federal Rules of Civil Procedure, request a trial by jury of any issues so triable by right.

Respectfully submitted,

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Attorneys for Stragent, LLC and SeeSaw Foundation

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing document was filed electronically in compliance with Local Rule CV-5(a). As such, this document was served on all counsel who are deemed to have consented to electronic service. Local Rule CV-5(a)(3)(A). Pursuant to Fed. R. Civ. P. 5(d) and Local Rule CV-5(d) and (e), all other counsel of record not deemed to have consented to electronic service were served with a true and correct copy of the foregoing by email and/or fax, on this the 17th day of September 2010.

Eric M. Albritton

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF TEXAS

TYLER DIVISION

STRAGENT, LLC, *et al.,*	§	
	§	
Plaintiffs,	§	**Civil Action No. 6:10-CV-242-LED**
	§	
v.	§	
	§	
CLASSMATES ONLINE, INC., *et al.,*	§	**JURY TRIAL DEMANDED**
	§	
Defendants.	§	

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

EXHIBIT A

US006665722B1

(12) **United States Patent**
Elliott

(10) **Patent No.: US 6,665,722 B1**
(45) **Date of Patent: Dec. 16, 2003**

(54) **STORE-AND-FORWARD PACKET RADIO SYSTEM AND METHOD**

(75) Inventor: **Brig Barnum Elliott**, Arlington, MA (US)

(73) Assignee: **BBNT Solutions LLC**, Cambridge, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 784 days.

(21) Appl. No.: **09/583,352**

(22) Filed: **May 31, 2000**

(51) **Int. Cl.**[7] **G06F 15/16**; H04L 12/28

(52) **U.S. Cl.** **709/227**; 709/245; 370/389; 370/392; 370/432; 370/471

(58) **Field of Search** 709/227, 245; 370/389, 392, 432, 471

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,509,000	A	* 4/1996	Oberlander	370/409
5,970,059	A	* 10/1999	Ahopelto et al.	370/338
5,978,386	A	* 11/1999	Hamalainen et al.	370/466
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6,034,970	A	* 3/2000	Levac et al.	370/466
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6,047,194	A	4/2000	Andersson	455/466
6,230,012	B1	* 5/2001	Willkie et al.	455/435.1

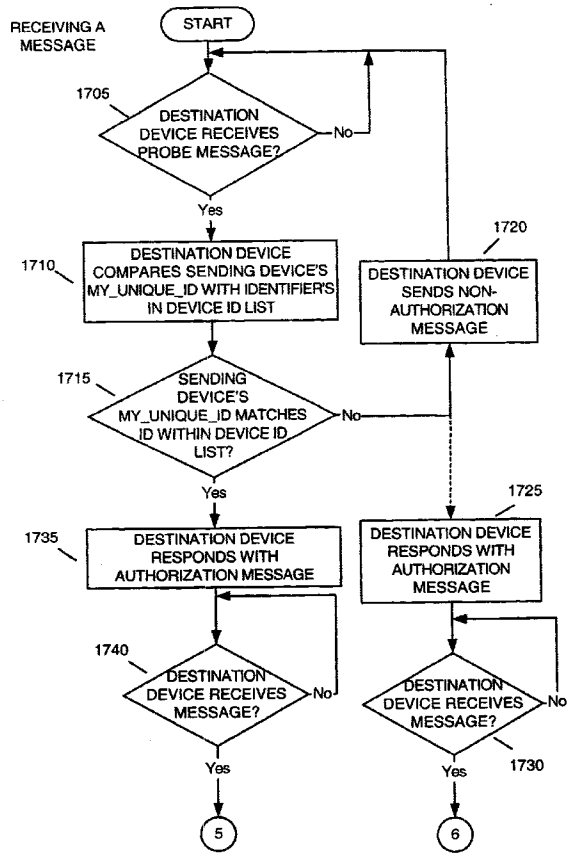
* cited by examiner

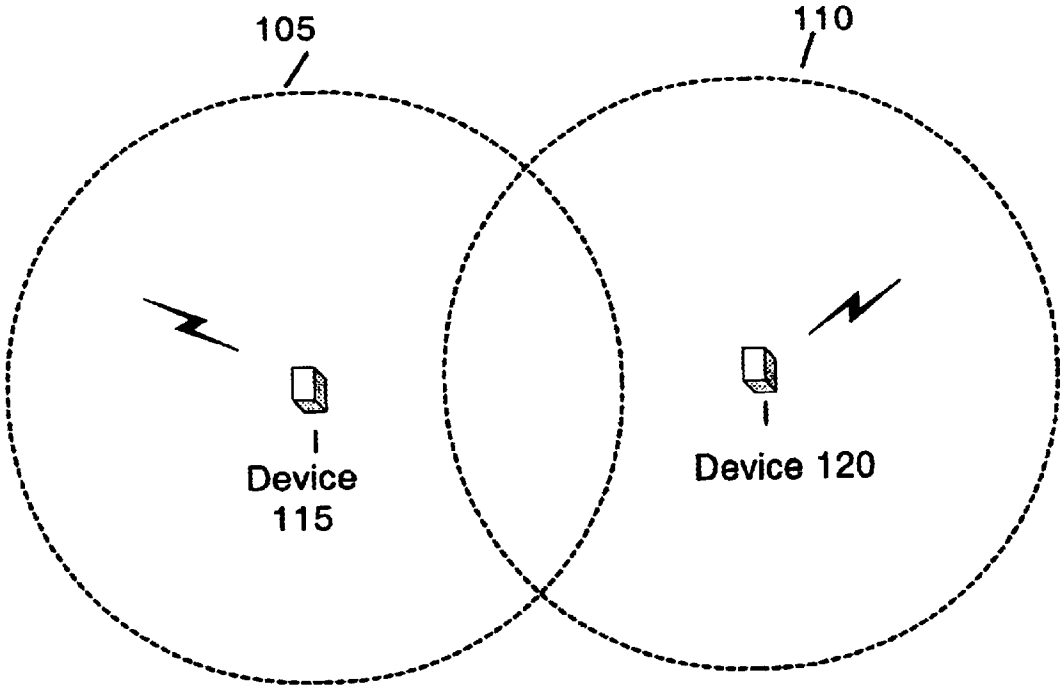
Primary Examiner—Krisna Lim
(74) *Attorney, Agent, or Firm*—Leonard Charles Suchyta; James K. Weixel

(57) **ABSTRACT**

A communication device sends a message to one or more recipients in a communications network. The communication device retrieves device identifiers from a list of device identifiers stored in a memory of the device. The device identifiers include audio, pictorial and/or video data. The communication device presents the audio, pictorial and/or video data to a user of the device in auditory or visual form **(1310)** and then receives user input in response to the presented data **(1325)**. The communication device designates a second communication device as a destination for the message based on the user input **(1330)**. The communication device then sends the message to the second communication device.

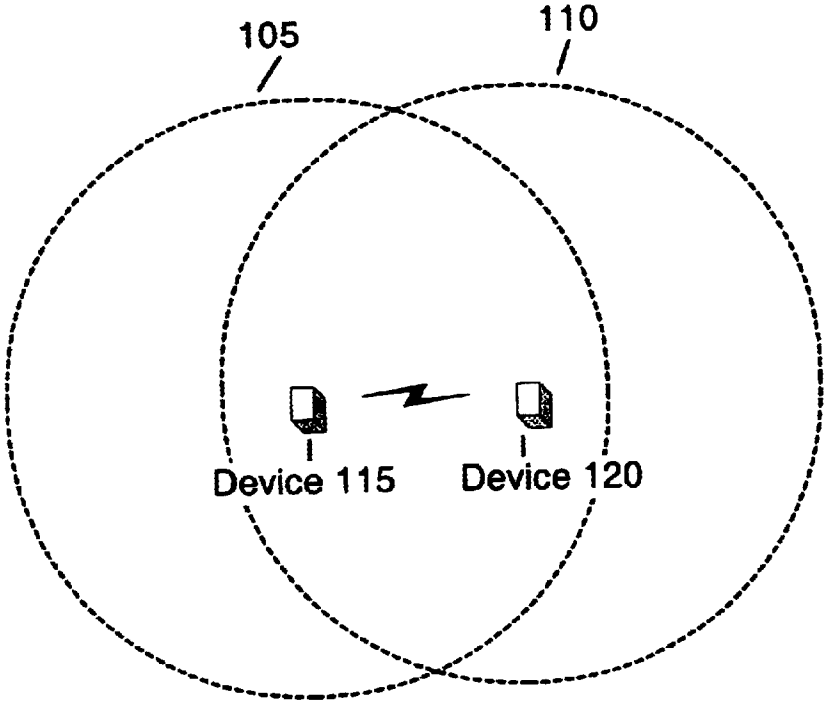
48 Claims, 17 Drawing Sheets





PRIOR ART

FIG. 1



PRIOR ART

FIG. 2

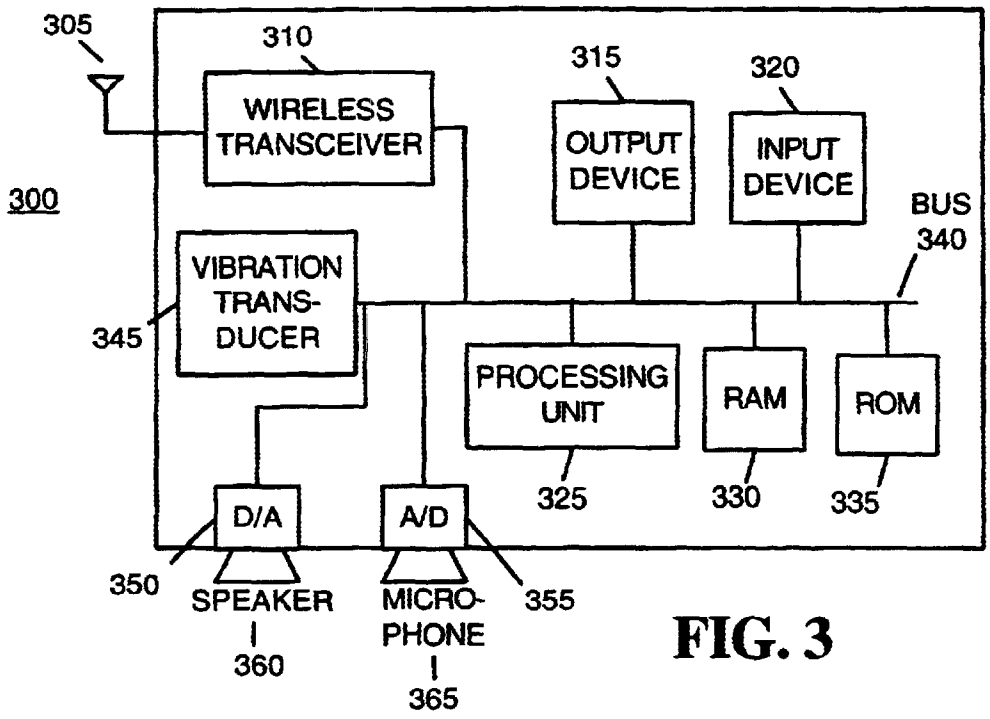

305
310
315
320
WIRELESS TRANSCEIVER
OUTPUT DEVICE
INPUT DEVICE
300
BUS
340
VIBRATION TRANS-DUCER
345
PROCESSING UNIT
RAM
ROM
325
330
335
D/A
A/D
350
SPEAKER
360
MICRO-PHONE
365
355

FIG. 3

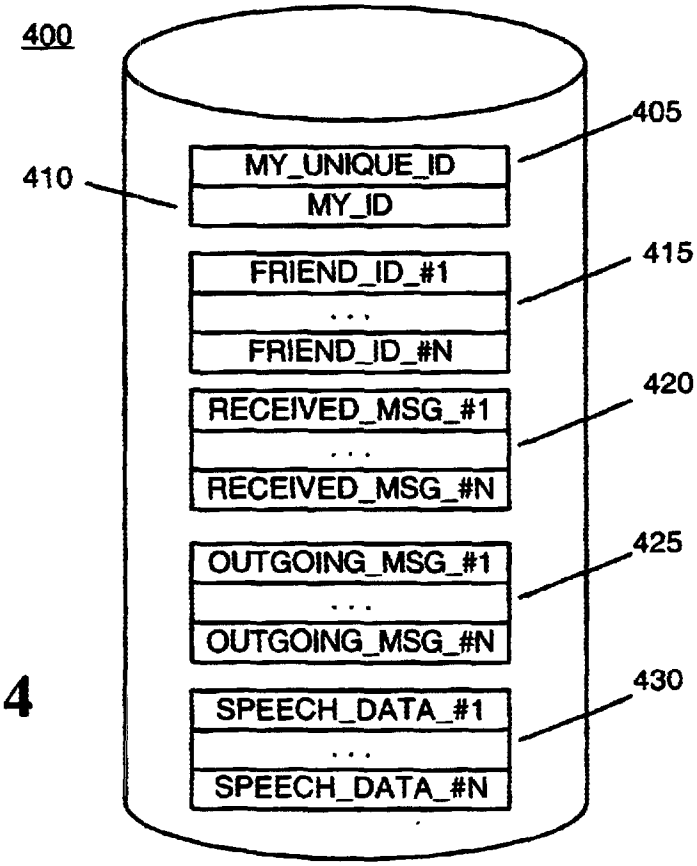

400
405
410
MY_UNIQUE_ID
MY_ID
415
FRIEND_ID_#1
. . .
FRIEND_ID_#N
420
RECEIVED_MSG_#1
. . .
RECEIVED_MSG_#N
425
OUTGOING_MSG_#1
. . .
OUTGOING_MSG_#N
430
SPEECH_DATA_#1
. . .
SPEECH_DATA_#N

FIG. 4

FIG. 5

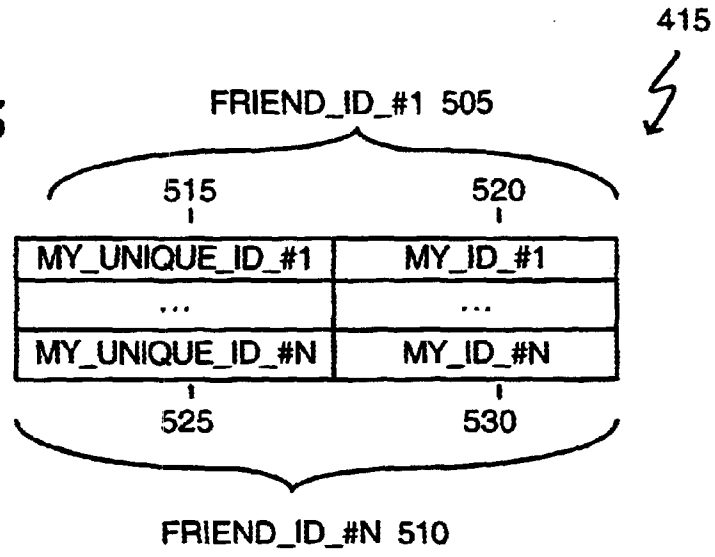
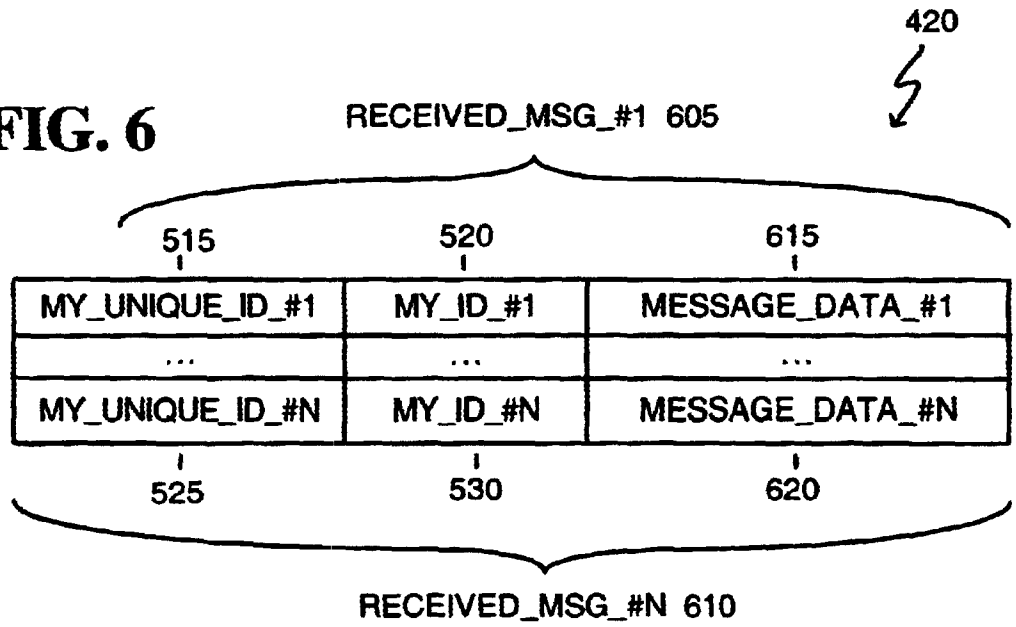

415
FRIEND_ID_#1 505
515
520
MY_UNIQUE_ID_#1
MY_ID_#1
...
...
MY_UNIQUE_ID_#N
MY_ID_#N
525
530
FRIEND_ID_#N 510

FIG. 6


420
RECEIVED_MSG_#1 605
515
520
615
MY_UNIQUE_ID_#1
MY_ID_#1
MESSAGE_DATA_#1
...
...
...
MY_UNIQUE_ID_#N
MY_ID_#N
MESSAGE_DATA_#N
525
530
620
RECEIVED_MSG_#N 610

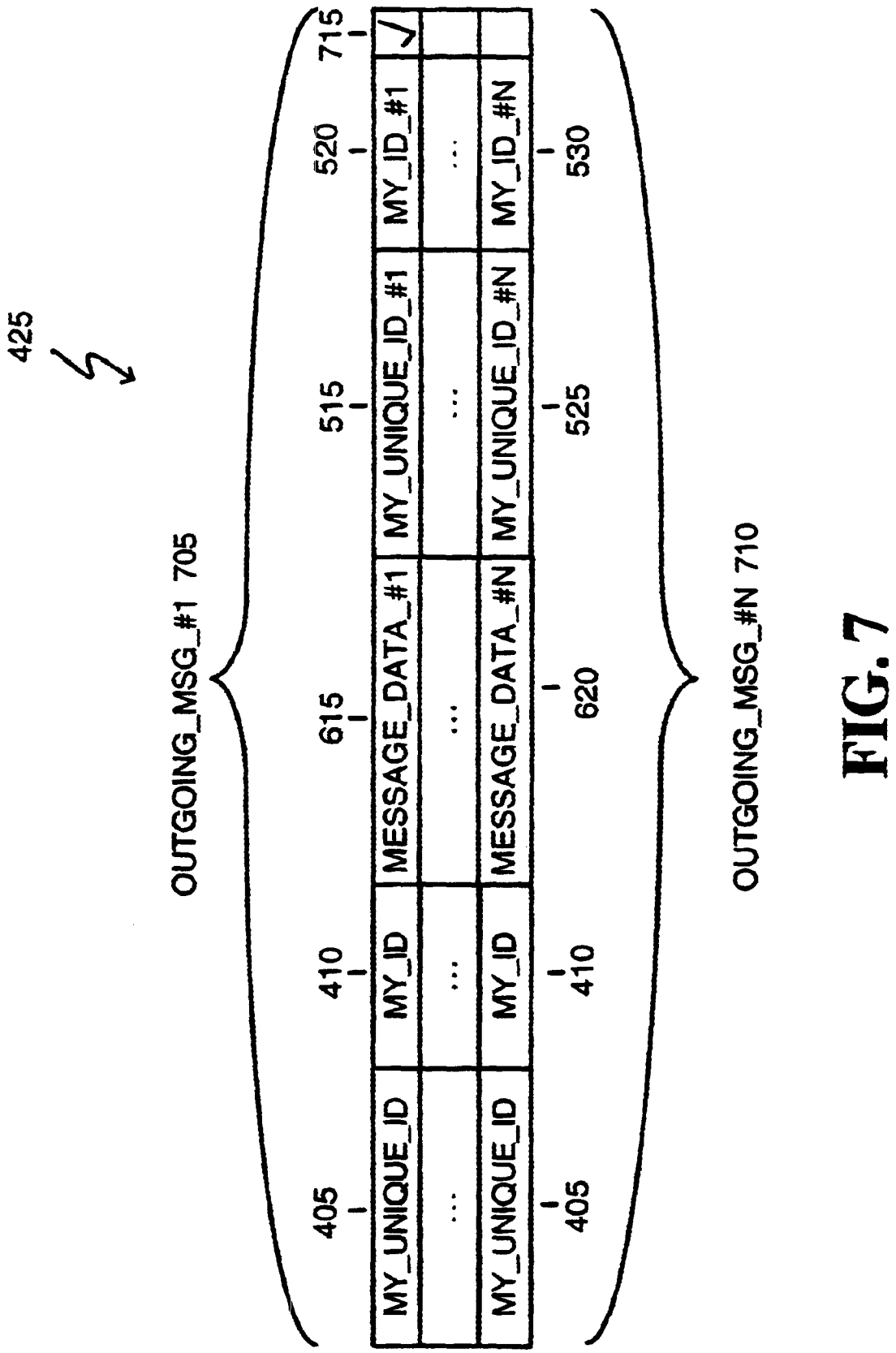

425
OUTGOING_MSG_#1 705
OUTGOING_MSG_#N 710
MY_UNIQUE_ID
MY_ID
MESSAGE_DATA_#1
MY_UNIQUE_ID_#1
MY_ID_#1
MY_UNIQUE_ID
MY_ID
MESSAGE_DATA_#N
MY_UNIQUE_ID_#N
MY_ID_#N
405
410
615
515
520
715
620
525
530

FIG. 7

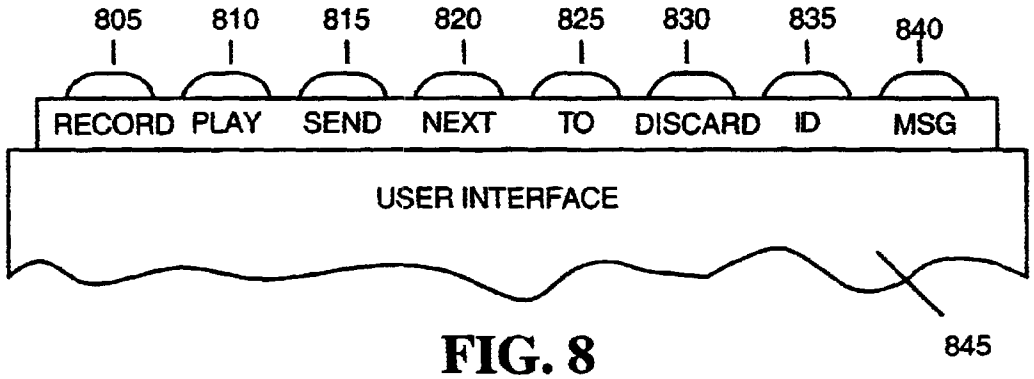

805
810
815
820
825
830
835
840
RECORD
PLAY
SEND
NEXT
TO
DISCARD
ID
MSG
USER INTERFACE
845

FIG. 8

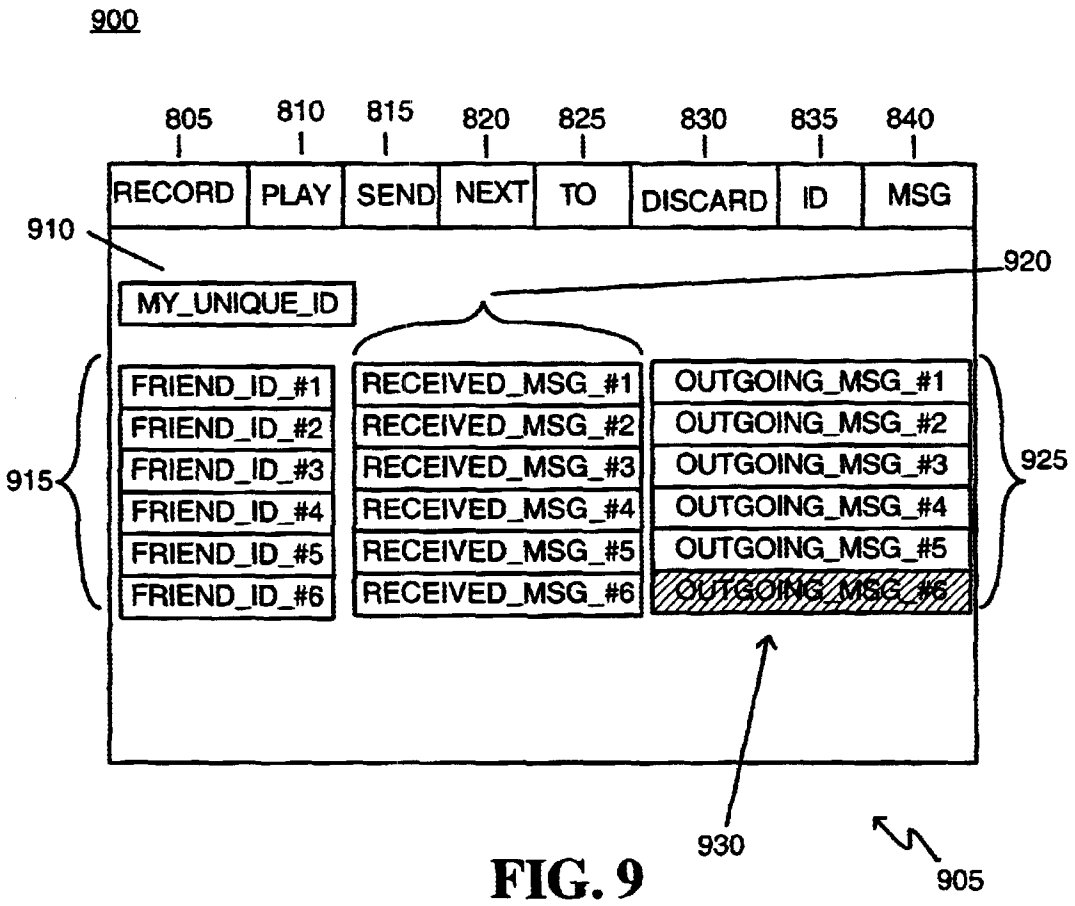

900
805
810
815
820
825
830
835
840
RECORD
PLAY
SEND
NEXT
TO
DISCARD
ID
MSG
910
920
MY_UNIQUE_ID
915
925
FRIEND_ID_#1
FRIEND_ID_#2
FRIEND_ID_#3
FRIEND_ID_#4
FRIEND_ID_#5
FRIEND_ID_#6
RECEIVED_MSG_#1
RECEIVED_MSG_#2
RECEIVED_MSG_#3
RECEIVED_MSG_#4
RECEIVED_MSG_#5
RECEIVED_MSG_#6
OUTGOING_MSG_#1
OUTGOING_MSG_#2
OUTGOING_MSG_#3
OUTGOING_MSG_#4
OUTGOING_MSG_#5
OUTGOING_MSG_#6
930
905

FIG. 9

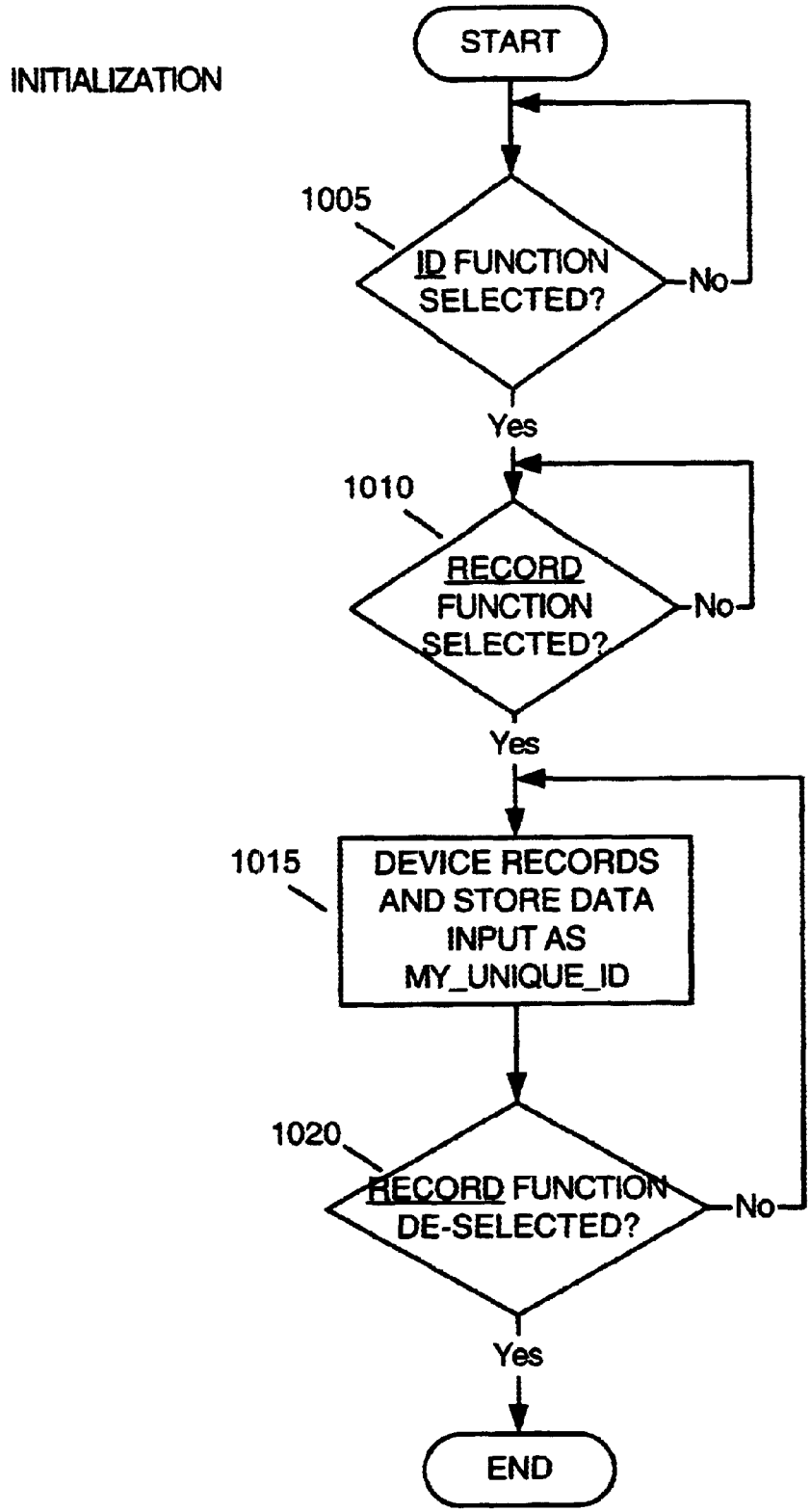

INITIALIZATION
START
1005
ID FUNCTION SELECTED?
No
Yes
1010
RECORD FUNCTION SELECTED?
No
Yes
1015
DEVICE RECORDS AND STORE DATA INPUT AS MY_UNIQUE_ID
1020
RECORD FUNCTION DE-SELECTED?
No
Yes
END

FIG. 10

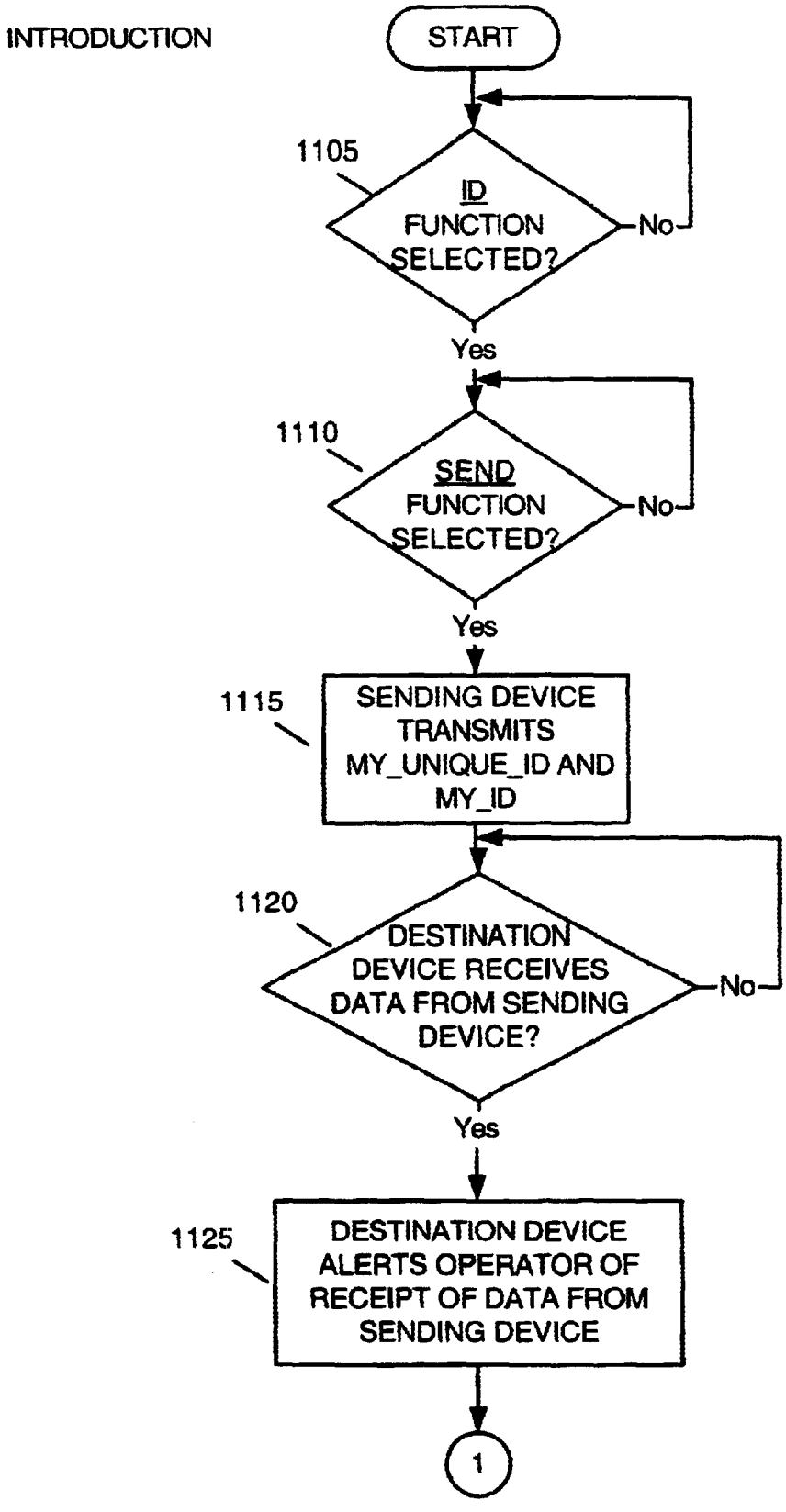

INTRODUCTION
START
1105
ID FUNCTION SELECTED?
No
Yes
1110
SEND FUNCTION SELECTED?
No
Yes
1115
SENDING DEVICE TRANSMITS MY_UNIQUE_ID AND MY_ID
1120
DESTINATION DEVICE RECEIVES DATA FROM SENDING DEVICE?
No
Yes
1125
DESTINATION DEVICE ALERTS OPERATOR OF RECEIPT OF DATA FROM SENDING DEVICE
1

FIG. 11

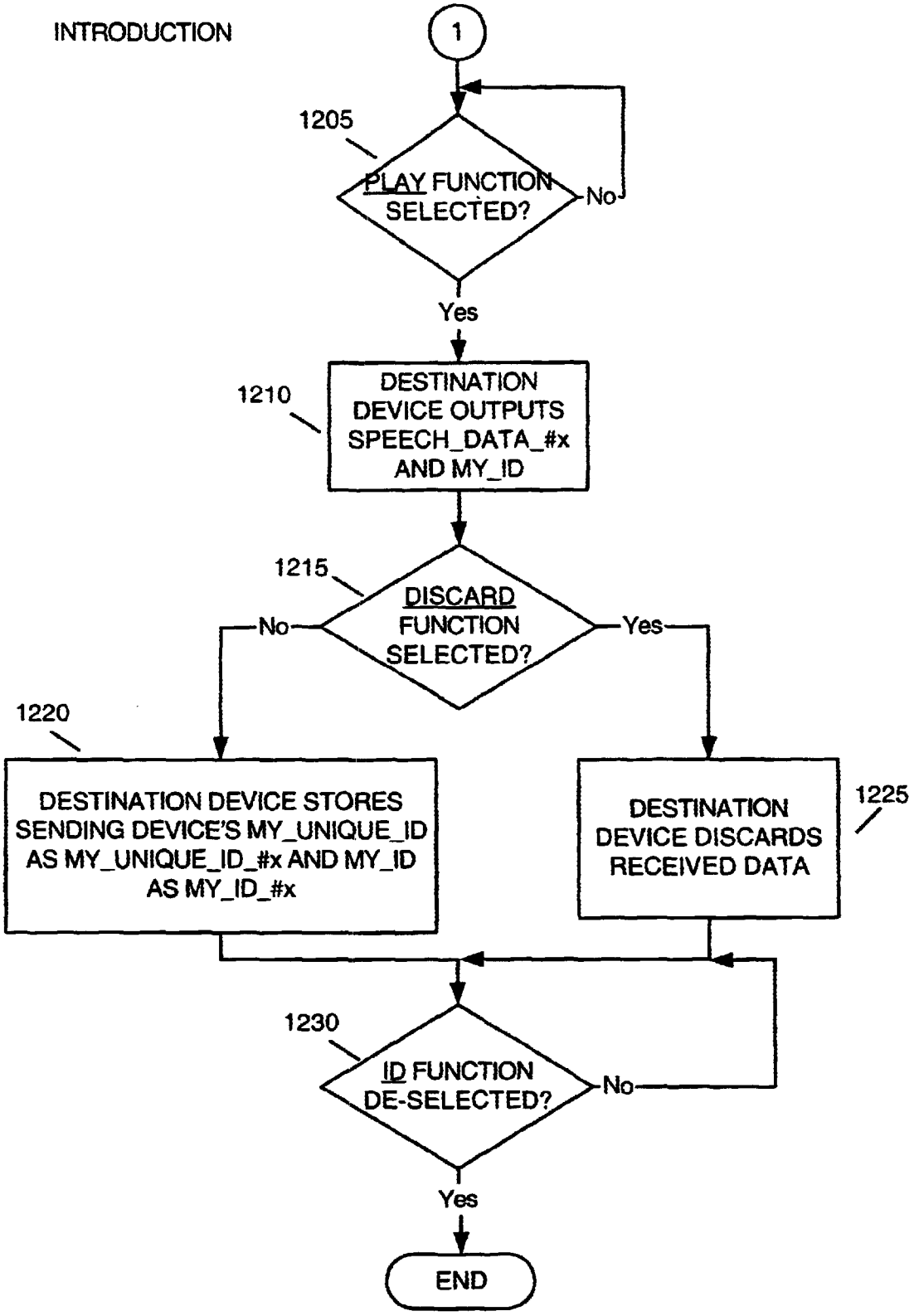

INTRODUCTION
1
1205
PLAY FUNCTION SELECTED?
No
Yes
1210
DESTINATION DEVICE OUTPUTS SPEECH_DATA_#x AND MY_ID
1215
DISCARD FUNCTION SELECTED?
No
Yes
1220
DESTINATION DEVICE STORES SENDING DEVICE'S MY_UNIQUE_ID AS MY_UNIQUE_ID_#x AND MY_ID AS MY_ID_#x
1225
DESTINATION DEVICE DISCARDS RECEIVED DATA
1230
ID FUNCTION DE-SELECTED?
No
Yes
END

FIG. 12

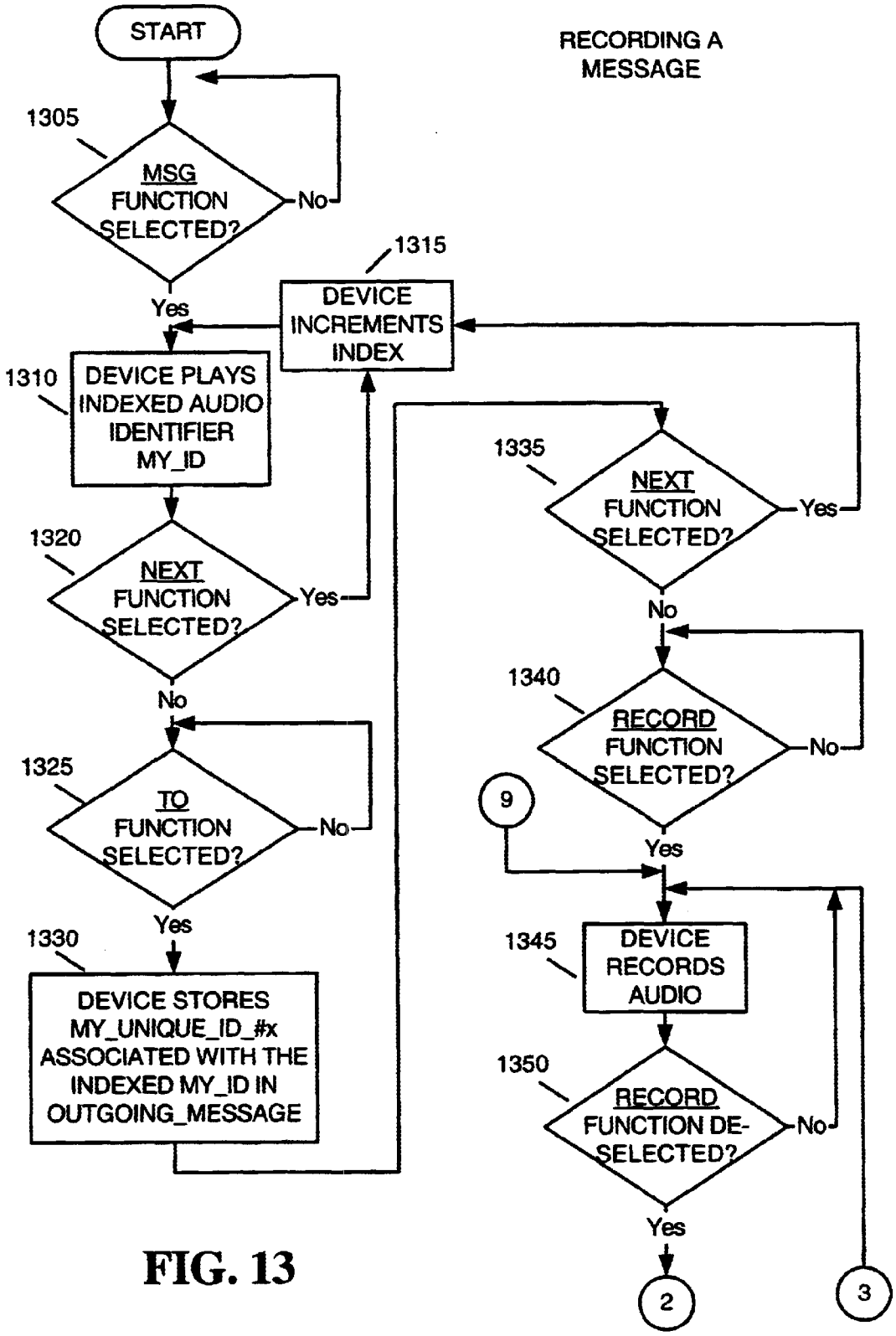

START
RECORDING A MESSAGE
1305
MSG FUNCTION SELECTED?
No
Yes
1315
DEVICE INCREMENTS INDEX
1310
DEVICE PLAYS INDEXED AUDIO IDENTIFIER MY_ID
1320
NEXT FUNCTION SELECTED?
Yes
No
1325
TO FUNCTION SELECTED?
No
Yes
1330
DEVICE STORES MY_UNIQUE_ID_#x ASSOCIATED WITH THE INDEXED MY_ID IN OUTGOING_MESSAGE
1335
NEXT FUNCTION SELECTED?
Yes
No
1340
RECORD FUNCTION SELECTED?
No
9
Yes
1345
DEVICE RECORDS AUDIO
1350
RECORD FUNCTION DE-SELECTED?
No
Yes
2
3

FIG. 13

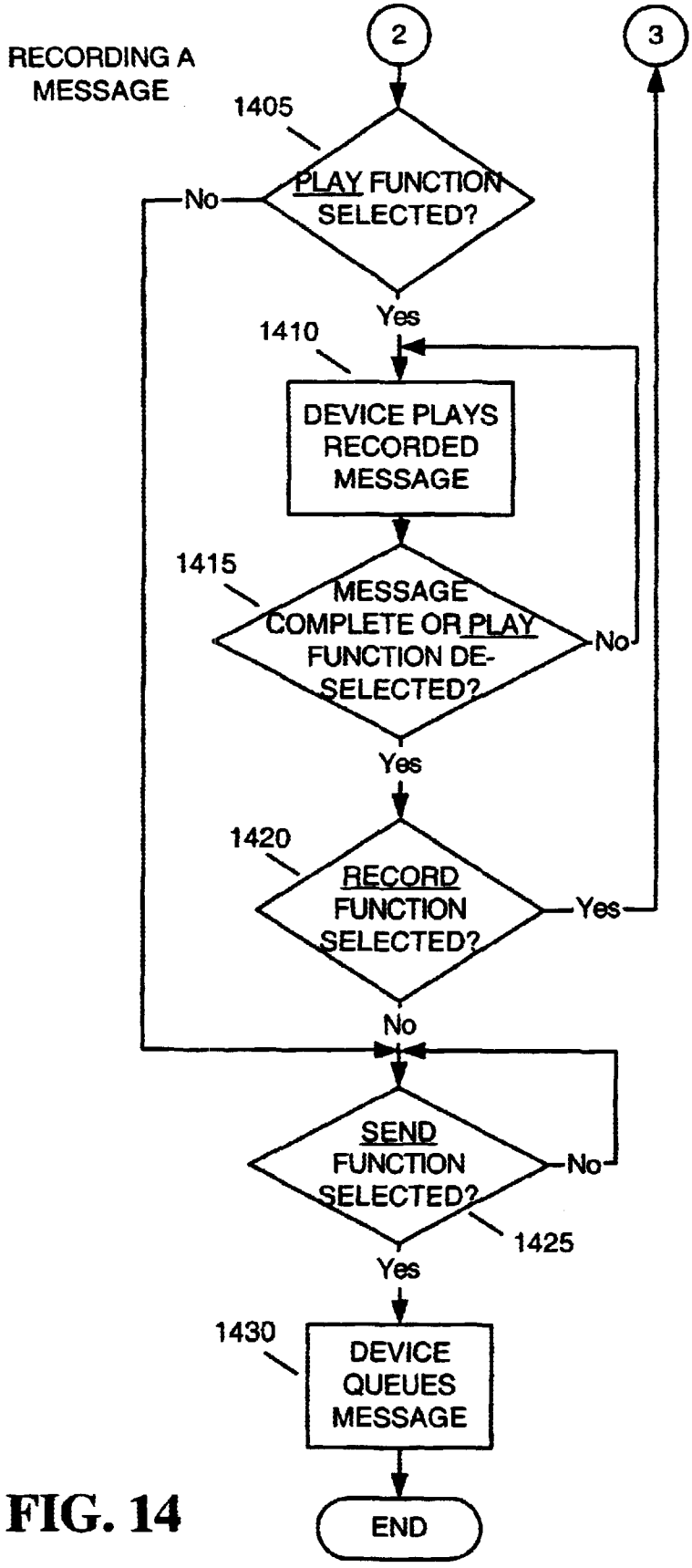

RECORDING A MESSAGE
2
3
1405
PLAY FUNCTION SELECTED?
No
Yes
1410
DEVICE PLAYS RECORDED MESSAGE
1415
MESSAGE COMPLETE OR PLAY FUNCTION DE-SELECTED?
No
Yes
1420
RECORD FUNCTION SELECTED?
Yes
No
SEND FUNCTION SELECTED?
No
1425
Yes
1430
DEVICE QUEUES MESSAGE
END

FIG. 14

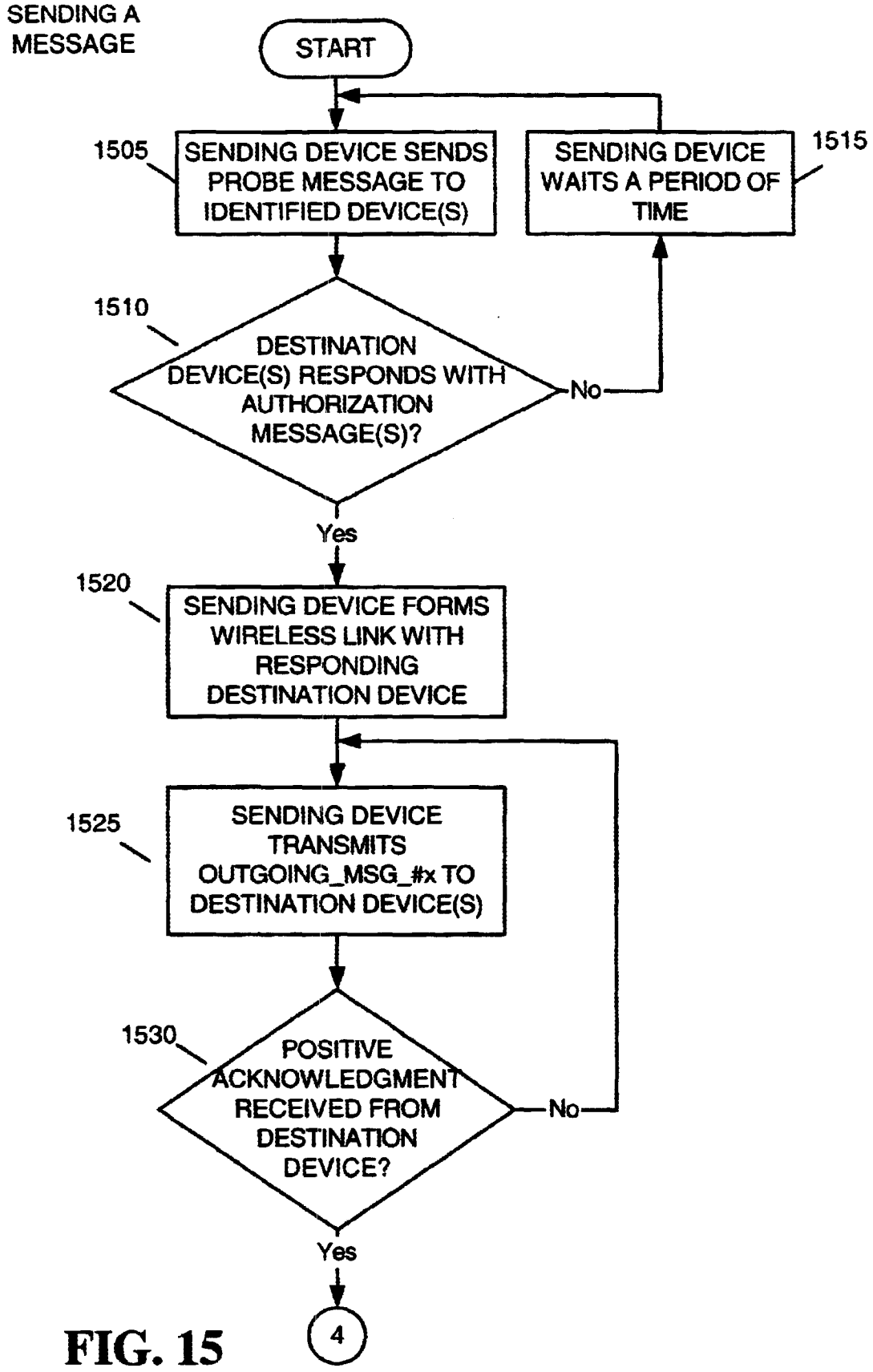

SENDING A MESSAGE
START
1505
SENDING DEVICE SENDS PROBE MESSAGE TO IDENTIFIED DEVICE(S)
SENDING DEVICE WAITS A PERIOD OF TIME
1515
1510
DESTINATION DEVICE(S) RESPONDS WITH AUTHORIZATION MESSAGE(S)?
No
Yes
1520
SENDING DEVICE FORMS WIRELESS LINK WITH RESPONDING DESTINATION DEVICE
1525
SENDING DEVICE TRANSMITS OUTGOING_MSG_#x TO DESTINATION DEVICE(S)
1530
POSITIVE ACKNOWLEDGMENT RECEIVED FROM DESTINATION DEVICE?
No
Yes
4

FIG. 15

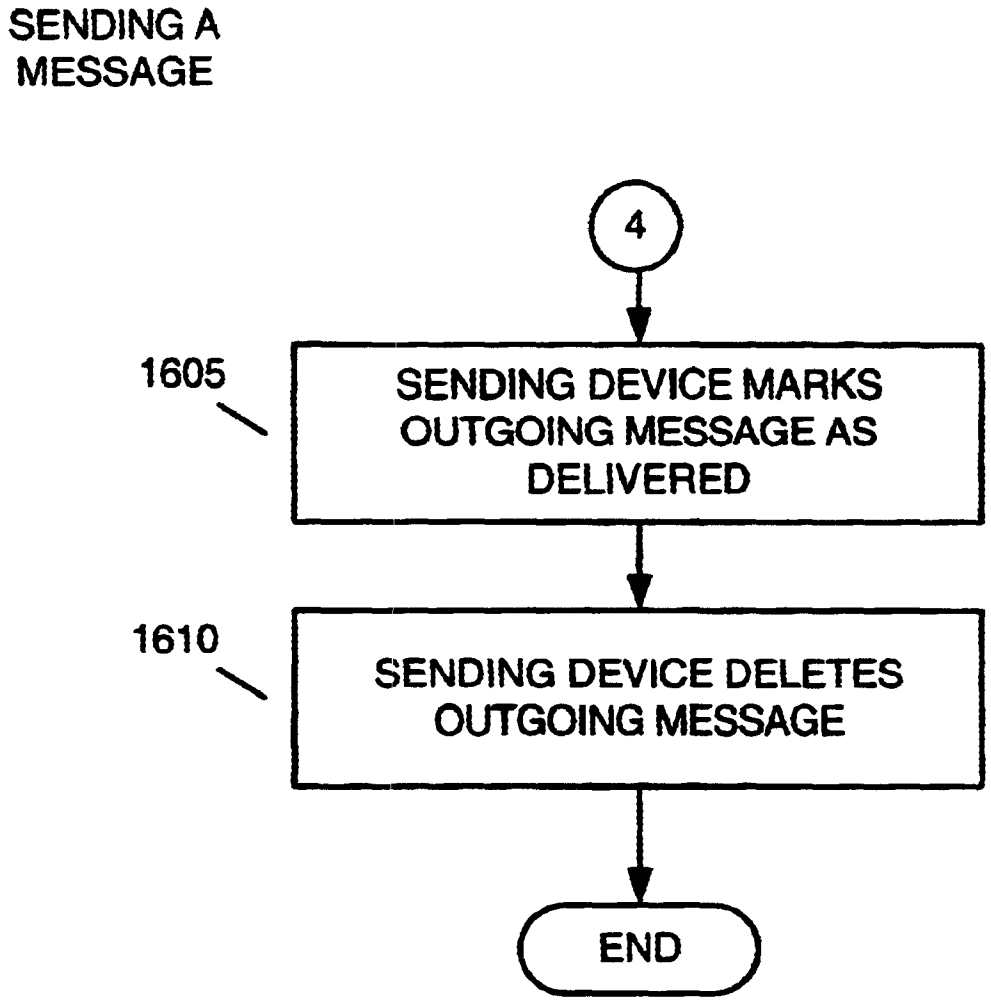

SENDING A MESSAGE
4
1605
SENDING DEVICE MARKS OUTGOING MESSAGE AS DELIVERED
1610
SENDING DEVICE DELETES OUTGOING MESSAGE
END

FIG. 16

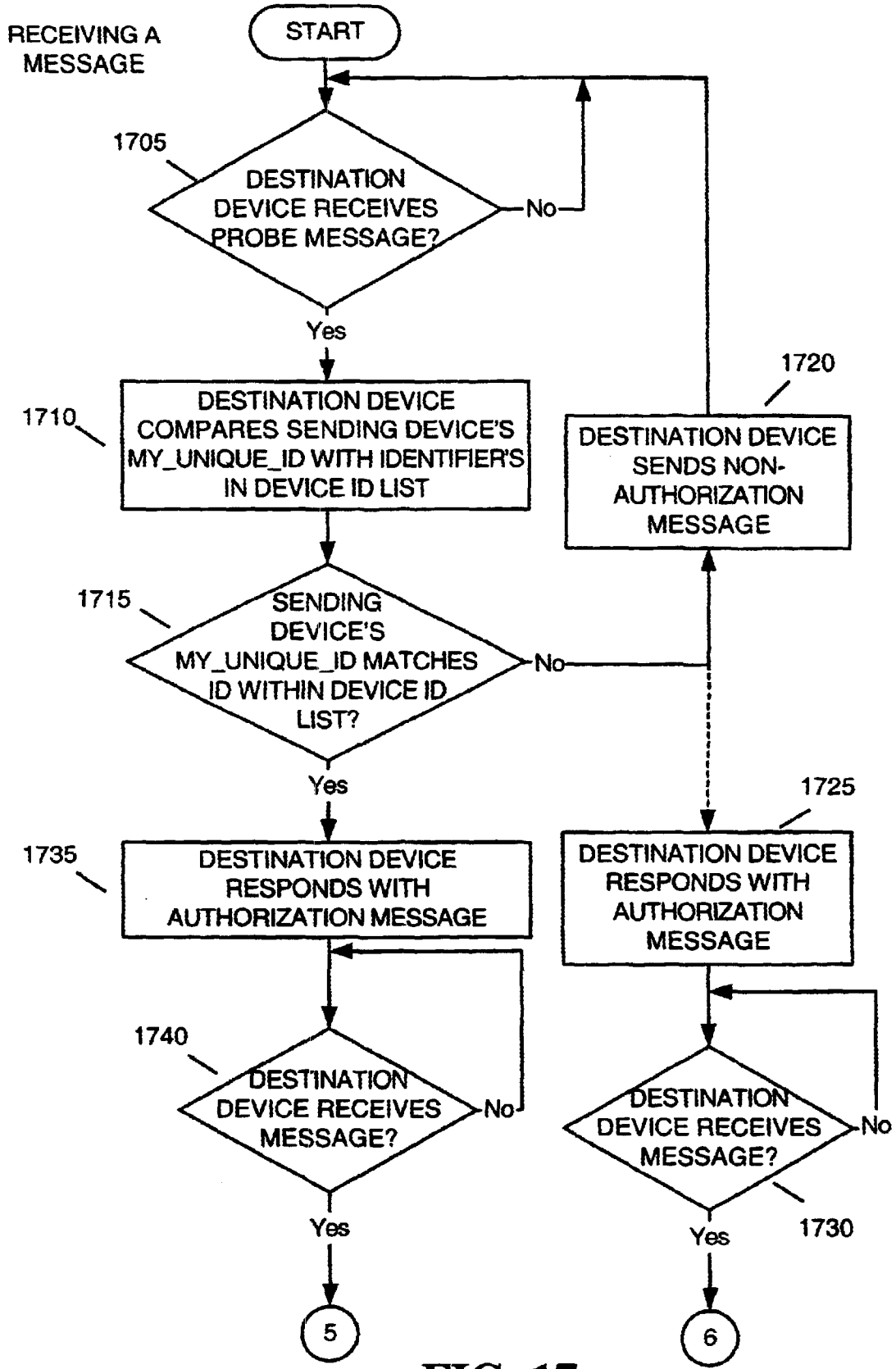

RECEIVING A MESSAGE
START
1705
DESTINATION DEVICE RECEIVES PROBE MESSAGE?
No
Yes
1710
DESTINATION DEVICE COMPARES SENDING DEVICE'S MY_UNIQUE_ID WITH IDENTIFIER'S IN DEVICE ID LIST
1720
DESTINATION DEVICE SENDS NON-AUTHORIZATION MESSAGE
1715
SENDING DEVICE'S MY_UNIQUE_ID MATCHES ID WITHIN DEVICE ID LIST?
No
Yes
1725
1735
DESTINATION DEVICE RESPONDS WITH AUTHORIZATION MESSAGE
DESTINATION DEVICE RESPONDS WITH AUTHORIZATION MESSAGE
1740
DESTINATION DEVICE RECEIVES MESSAGE?
No
Yes
DESTINATION DEVICE RECEIVES MESSAGE?
No
1730
Yes
5
6

FIG. 17

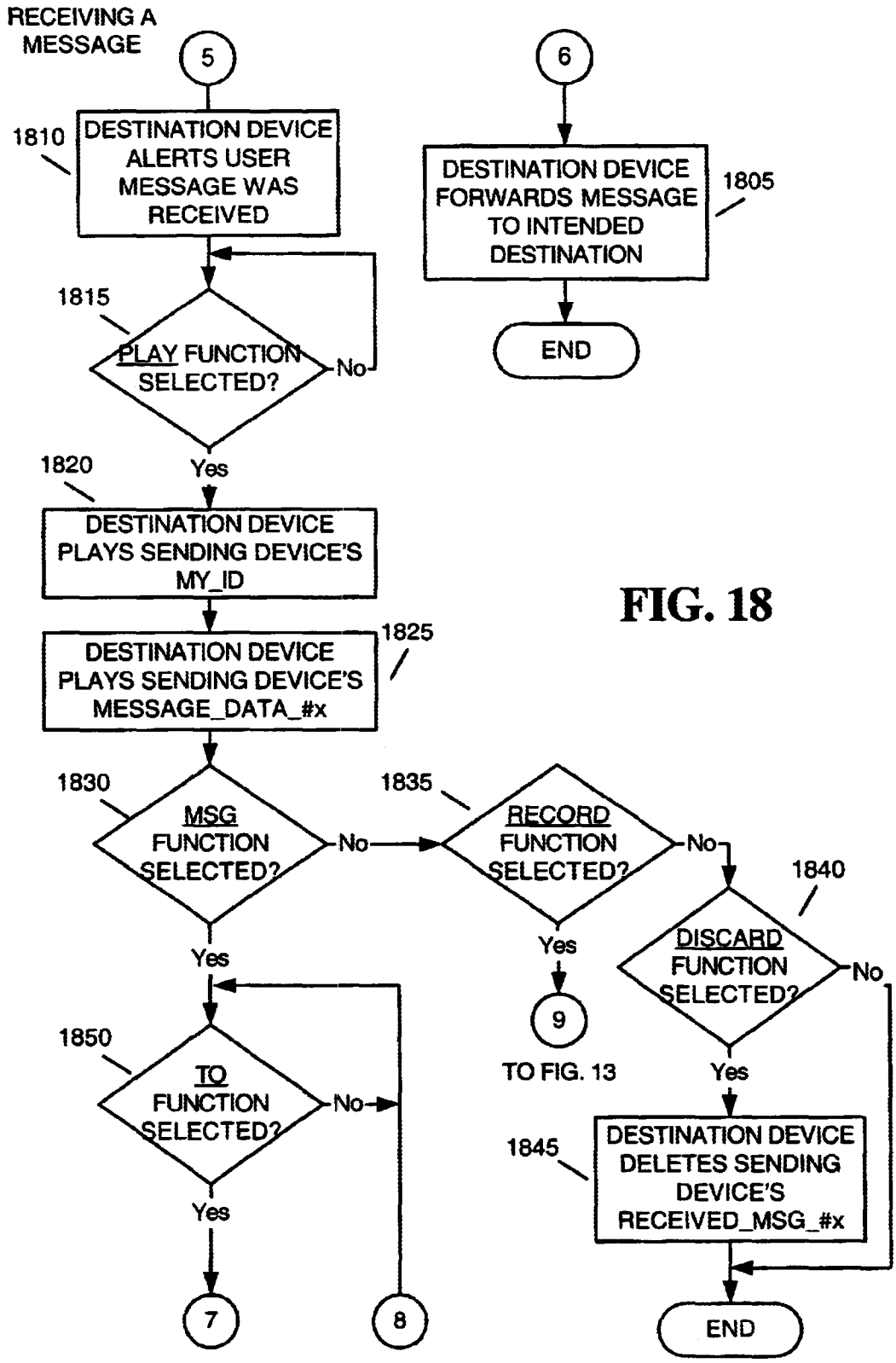

RECEIVING A MESSAGE
5
1810
DESTINATION DEVICE ALERTS USER MESSAGE WAS RECEIVED
1815
PLAY FUNCTION SELECTED?
No
Yes
1820
DESTINATION DEVICE PLAYS SENDING DEVICE'S MY_ID
DESTINATION DEVICE PLAYS SENDING DEVICE'S MESSAGE_DATA_#x
1825
1830
MSG FUNCTION SELECTED?
No
Yes
1835
RECORD FUNCTION SELECTED?
No
Yes
9
TO FIG. 13
1840
DISCARD FUNCTION SELECTED?
No
Yes
1845
DESTINATION DEVICE DELETES SENDING DEVICE'S RECEIVED_MSG_#x
1850
TO FUNCTION SELECTED?
No
Yes
7
8
6
DESTINATION DEVICE FORWARDS MESSAGE TO INTENDED DESTINATION
1805
END
END

FIG. 18

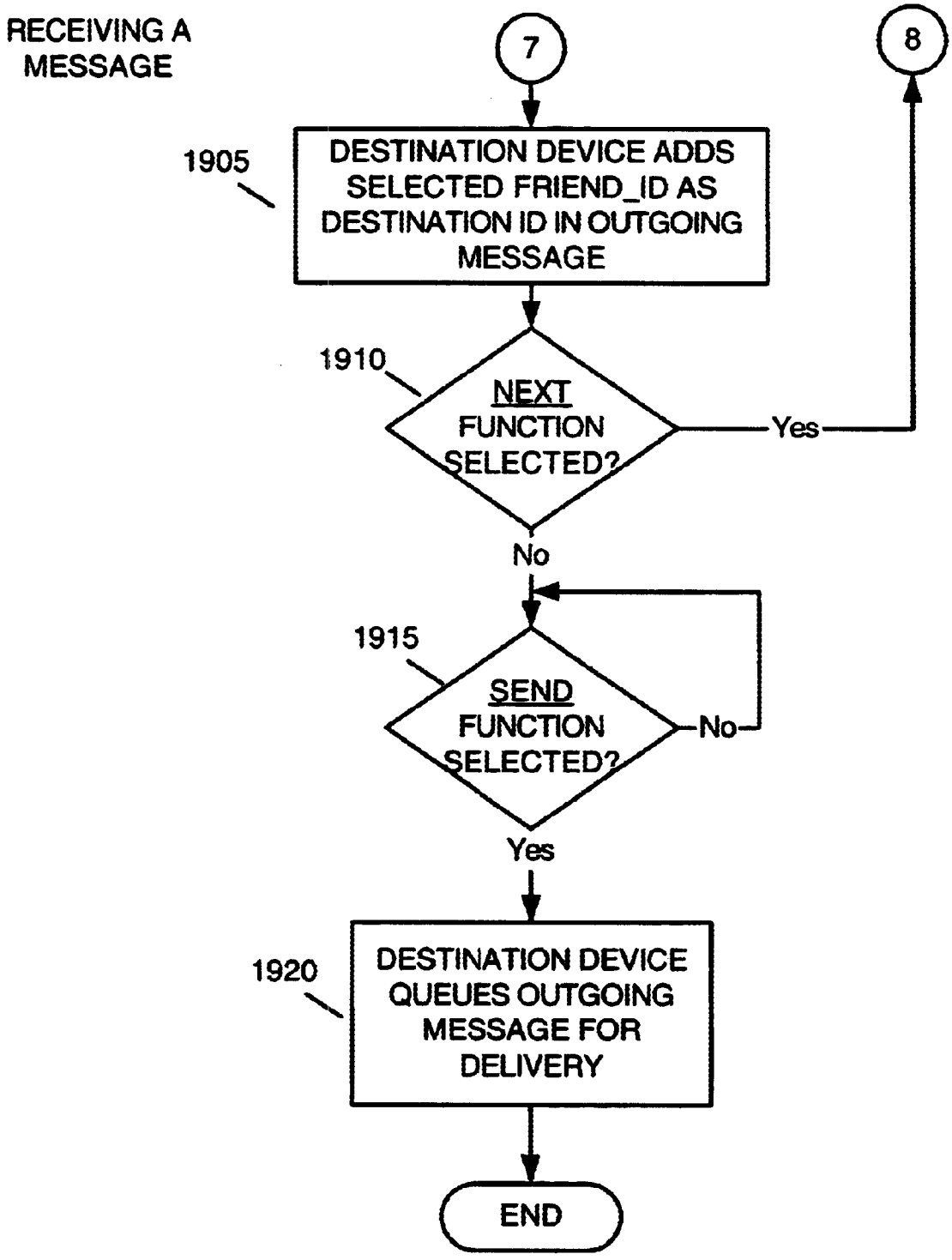

RECEIVING A MESSAGE
7
8
1905
DESTINATION DEVICE ADDS SELECTED FRIEND_ID AS DESTINATION ID IN OUTGOING MESSAGE
1910
NEXT FUNCTION SELECTED?
Yes
No
1915
SEND FUNCTION SELECTED?
No
Yes
1920
DESTINATION DEVICE QUEUES OUTGOING MESSAGE FOR DELIVERY
END

FIG. 19

RE-INITIALIZATION

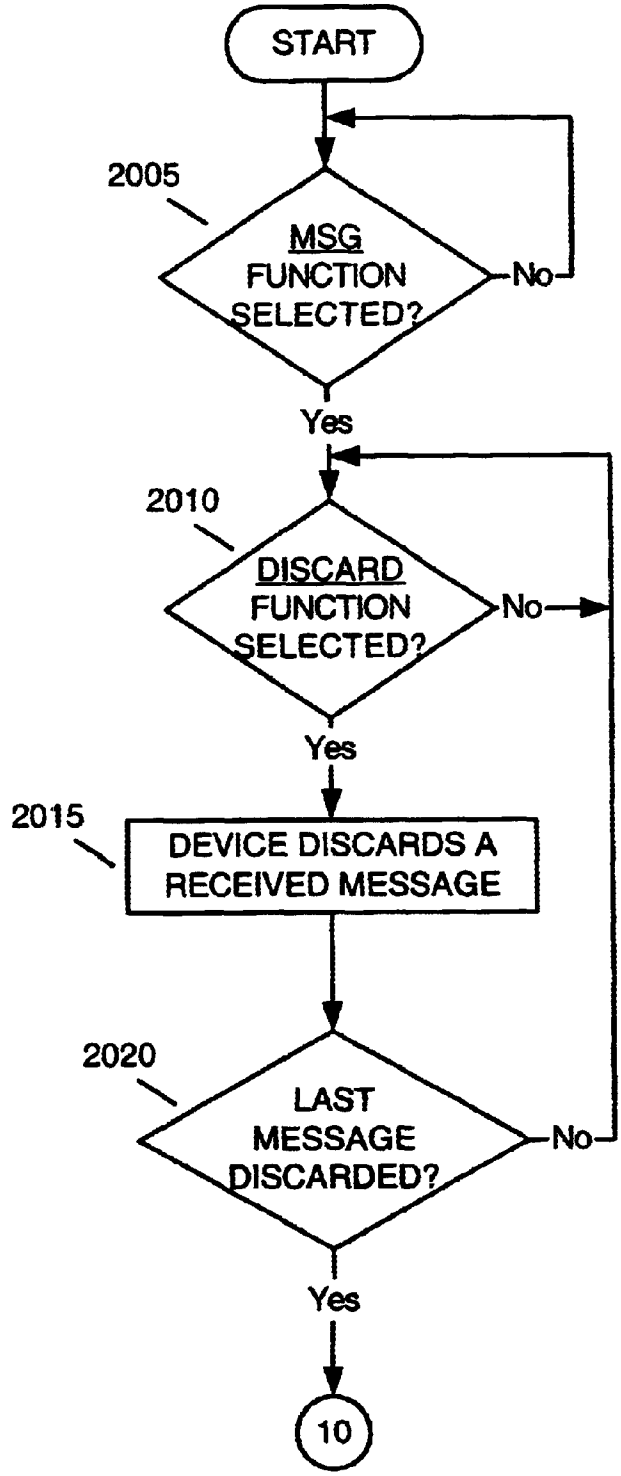


FIG. 20

RE-INITIALIZATION

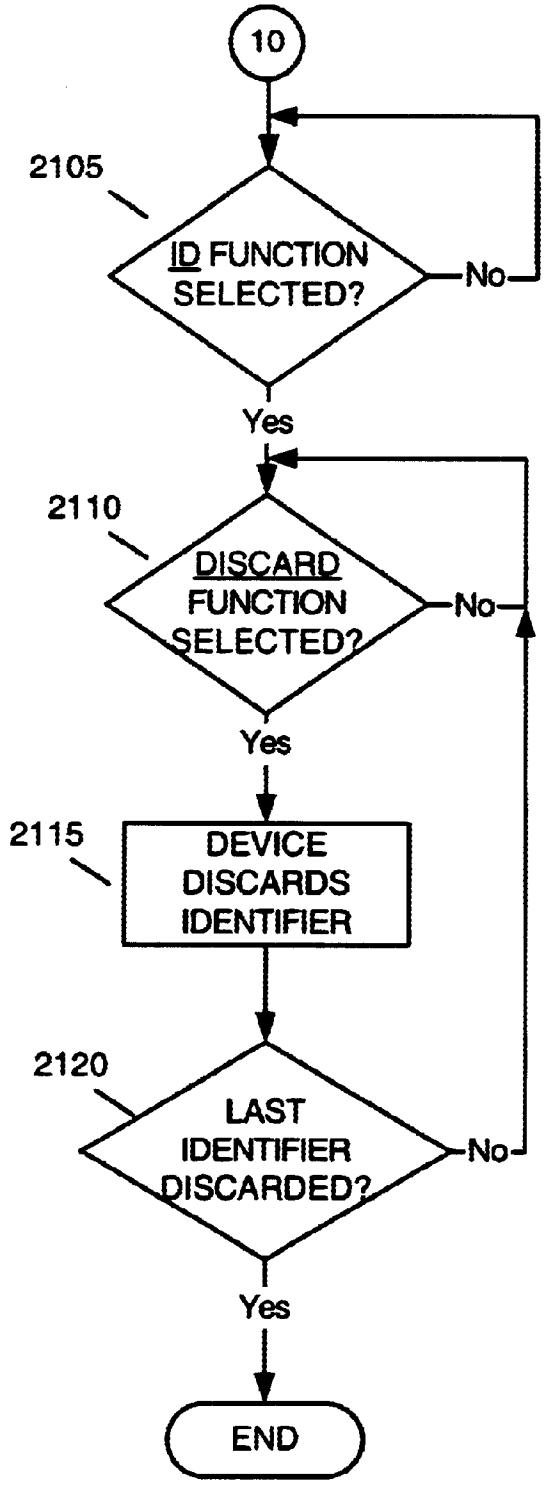


FIG. 21

STORE-AND-FORWARD PACKET RADIO SYSTEM AND METHOD

FIELD OF THE INVENTION

The present invention relates generally to packet radio networks and, more particularly, to systems and methods for providing improved user-friendly packet delivery techniques in mobile packet radio networks.

BACKGROUND OF THE INVENTION

Wireless data communication is often required in an environment where communications infrastructure, such as base stations or a wired backbone network, does not exist or is uneconomical or impractical to use. For example, in military or emergency environments, adequate infrastructure often does not exist in necessary locations and constructing such an infrastructure would be either impractical or uneconomical for the short-term use that is often required. Mobile wireless networks, which permit communication between wireless devices in the network over an air interface link without routing packets through any portion of a conventional cellular network, such as the wired backbone network, base station controllers, or base stations, have therefore been developed to provide wireless data communications in such environments.

Point-to-point communication in a mobile wireless network suffers from a number of disadvantages. One disadvantage is the limited transmission range associated with each wireless device in the network. Each wireless device in the network is limited in the distance over which it can reliably transmit, with transmission ranges of between a few feet and hundreds of feet being typical. Therefore, it is often the case that a source wireless device is out of transmission range with a destination wireless device with which the source device desires to communicate. The source wireless device user, therefore, has to wait until the destination wireless device comes within transmission range before attempting to communicate, or re-transmit the data at a later time when no acknowledgment is received from the destination device indicating that the device received the data from the source device.

FIG. **1** is a diagram of a two-node network illustrating this problem. The illustrative network includes a source device **115** and a destination device **120**. As shown, each device **(115, 120)** has an effective transmission range delineated by dotted lines **105** and **110**, respectively. Since the transmission range of source device **115** (dotted line **105**) does not encompass destination device **120**, device **115** cannot communicate with node **120**. Device **115** must, therefore, move in closer proximity to device **120** to be able to transmit data to device **120**. FIG. **2** illustrates the situation where source device **115** and destination device **120** have moved within transmission range of one another. As shown, each device's **(115, 120)** effective transmission range (delineated by dotted lines **105** and **110**, respectively) encompasses the other device. Devices **115** and **120**, therefore, can communicate with each other.

An additional disadvantage with point-to-point communication in a mobile wireless network is that a source device may be unable to communicate with a destination device for a given period of time because the destination wireless device is either turned off or in an off-line status. In this case, the user of the source device must wait until the destination wireless returns to an on-line state, or turns on, before attempting once again to transmit data.

Therefore, there exists a need for a system and method that enables data communication between devices in a mobile wireless network, where the user of a sending device need only indicate data that is to be transmitted and the destination node to which the data is to be transmitted, and the sending device automatically attempts transmission of the data to the destination device, including re-transmission attempts if the destination device is out of transmission range, turned off, or off-line.

SUMMARY OF THE INVENTION

Systems and methods consistent with the present invention address this need by providing a wireless device that may store, and then forward, messages to destination devices when the destination devices come within transmission range of the wireless device.

In accordance with the purpose of the invention as embodied and broadly described herein, a method for introducing a first communication device to a second communication device in a communication network includes transmitting a message from the first communication device. The message includes presentation data that further includes at least one of audio, pictorial and video data representing an identity of the first communication device. The second communication device receives the message and extracts the presentation data from the message. The second communication device presents the presentation data to a user of the second communication device in auditory or visual form and receives user input in response to the presentation. The second communication device then stores the presentation data in memory in the second communication device based on the user input.

In another implementation consistent with the present invention, a method of providing an identifier for a communication device includes inputting at least one of auditory, pictorial and video information into the communication device and converting the auditory, pictorial and video information into device identifier data. The method further includes storing the device identifier data in a memory of said communication device.

In a further implementation consistent with the present invention, a method of sending a message to one or more recipients in a communications network includes retrieving device identifiers from a list of device identifiers stored in a memory of a first communication device. The device identifiers include at least one of audio, pictorial and video data. The method further includes presenting the audio, pictorial and video data to a user of the first communication device in auditory or visual form and receiving user input in response to said presentation. The method additionally includes designating a second communication device as a destination for the message based on said user input and sending the message to the second communication device.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate an embodiment of the invention and, together with the description, explain the invention. In the drawings,

FIG. **1** illustrates an exemplary network in which two wireless devices are located outside of one another's transmission ranges;

FIG. **2** illustrates an exemplary network in which two wireless devices have relocated within one another's transmission ranges;

FIG. **3** illustrates an exemplary wireless device consistent with the present invention;

FIG. **4** illustrates an exemplary database consistent with the present invention;

FIG. **5** illustrates a list of exemplary device identifiers consistent with the present invention;

FIG. **6** illustrates a list of exemplary messages received at a wireless device consistent with the present invention;

FIG. **7** illustrates a list of exemplary outgoing messages that are to be transmitted from a wireless device consistent with the present invention;

FIG. **8** illustrates a first exemplary user interface consistent with the present invention;

FIG. **9** illustrates a second exemplary user interface consistent with the present invention;

FIG. **10** illustrates an exemplary flow diagram of device initialization processing consistent with the present invention;

FIGS. **11–12** illustrate exemplary flow diagrams of device introduction processing consistent with the present invention;

FIGS. **13–14** illustrate exemplary flow diagrams of device processing for recording a message consistent with the present invention;

FIGS. **15–16** illustrate exemplary flow diagrams of device processing for sending a message consistent with the present invention;

FIGS. **17–19** illustrate exemplary flow diagrams of device processing for receiving a message consistent with the present invention; and

FIGS. **20–21** illustrate exemplary flow diagrams of device processing for reinitialization consistent with the present invention.

DETAILED DESCRIPTION

The following detailed description of the invention refers to the accompanying drawings. The same reference numbers in different drawings identify the same or similar elements. Also, the following detailed description does not limit the invention. Instead, the scope of the invention is defined by the appended claims.

Systems and methods consistent with the present invention improve the delivery of messages in wireless networks by permitting the temporary storage of messages in a sending device followed by the transmission or re-transmission of the messages when the destination devices come within the transmission range of the sending device.

EXEMPLARY DEVICE

FIG. **3** illustrates an exemplary wireless data communications device **300** in which a system and method, consistent with the present invention, for storing and forwarding messages can be implemented. Exemplary wireless device **300** may comprise a cellular phone, a personal or portable computer, a personal digital assistant (PDA) or the like. Wireless device **300** includes an antenna **305**, a wireless transceiver **310**, an output device **315**, an input device **320**, a processing unit **325**, a Random Access Memory (RAM) **330**, a Read Only Memory (ROM) **335**, a bus **340**, a vibration transducer **345**, a digital-to-analog (D/A) converter **350**, an analog-to-digital (A/D) converter **355**, a speaker **360** and a microphone **365**.

Antenna **305** may include a conventional antenna that facilitates reception and transmission of data packets by wireless transceiver **310**. Wireless transceiver **310** may include transceiver circuitry well known to one skilled in the art that can be tuned to multiple channels reserved for transmitting data in a wireless network (i.e., a channel can be a frequency, code, or time division of a physical radio frequency).

Input device **320** permits entry of data into wireless device **300** and includes a user interface (not shown). Output device **315** permits the output of data in video, audio, or hard copy format. Processing unit **325** performs all data processing functions for inputting, outputting, and processing of data. RAM **330** provides semi-permanent working storage of data and instructions for use by processing unit **325**. ROM **335** provides permanent or semipermanent storage of data and instructions for use by processing unit **325**. RAM **330** and ROM **335** may include large-capacity storage devices, such as a magnetic and/or optical recording medium and its corresponding drive. Bus **340** interconnects the various components of the device **300** to permit the components to communicate with one another.

Vibration transducer **345** includes a conventional mechanism for vibrating device **300** in response to command signals from processing unit **325**. Digital-to-analog (D/A) converter **350** includes conventional circuitry for converting digital audio signals from digital to analog signal form. Analog-to-digital (A/D) converter **355** includes conventional circuitry for converting analog audio input signals from microphone **365** to digital signal form. Speaker **360** includes a conventional mechanism for providing an auditory output of the D/A converted audio signals. Microphone **365** includes a conventional mechanism for converting auditory input into analog signals.

EXEMPLARY DATABASE

FIG. **4** illustrates an exemplary database **400**, consistent with the present invention, that may be stored within RAM **330** of device **300**. Database **400** may include device identifiers MY_UNIQUE_ID **405** and MY_ID **410** for device **300**, a list of device identifiers **415** for wireless devices other than device **300** consisting of FRIEND_ID_#1 through FRIEND_ID_#N, a list of messages **420** received by device **300** consisting of RECEIVED_MSG_#1 through RECEIVED_MSG$_{13}$ #N, a list of outgoing messages **425** that are queued for transmission in RAM **330** of device **300** consisting of OUTGOING_MSG_#1 through OUTGOING_MSG_#N, and a list **430** of speech data SPEECH_DATA_#1 through SPEECH_DATA_#N.

Device identifier MY_UNIQUE_ID **405** may include a global identifier that uniquely identifies device **300** and may consist of a unique series of bytes that are machine-readable. Audio identifier MY_ID **410** may include a recorded audio message that provides a human-understandable auditory identification for device **300**. Each data block from list **430** may include speech messages SPEECH_DATA_#1 through SPEECH_DATA_#N that are associated with the operation of device **300**. For example, when a message is received from another device, device **300** may play selected speech data from database **400**, containing an auditory message "A message has been received," to a user of the device **300**.

FIG. **5** further illustrates list **415** which may include device identifiers for other devices with which device **300** communicates. List **415** consists of device identifiers FRIEND_ID_#1 **505** through FRIEND_ID_#N **510**. Each device identifier FRIEND_ID_#1 **505** through FRIEND_ID_#N **510** may include unique global identifi-

ers MY_UNIQUE_ID_#1 **515** through MY_UNIQUE_ID_#N **525** and audio identifiers MY_ID_#1 **520** through MY_ID_#N **530**, respectively. Global identifiers MY_UNIQUE_ID_#1 **515** through MY_UNIQUE_ID_#N **525** identify devices other than device **300**. Audio identifiers MY_ID_#1 through MY_ID_#N comprise recorded audio messages that can provide human-understandable auditory identifications for the devices identified by the global identifiers.

FIG. **6** illustrates received message list **420** includes messages that have been received from other devices at device **300** and stored in RAM **330**. Each individual message, RECEIVED_MSG_#1 **605** through RECEIVED_MSG_#N **610** may consist of unique global identifiers MY_UNIQUE_ID_#1 **515** through MY_UNIQUE_ID_#N **525** (described above), audio identifiers MY_ID_#1 **520** through MY_ID_#N **530** (described above), and message data MESSAGE_DATA_#1 **615** through MESSAGE_DATA_#N **620**, respectively. Each message MESSAGE_DATA_#1 **615** through MESSAGE_DATA_#N **620**, may consist of audio, video, or pictorial data which includes the message from a device other than device **300**.

FIG. **7** illustrates outgoing message list **425** that include messages that are waiting in queue in RAM **330** for transmission to a selected destination device(s). Each individual message, OUTGOING_MSG_#1 **705** through OUTGOING_MSG_#N **710**, may consist of the global device identifier MY_UNIQUE_ID **405** and audio identifier MY_ID **410** of device **300**, indicating device **300** as the message source. Each individual message from list **425** additionally may consist of unique global identifiers MY_UNIQUE_ID_#1 **515** through MY_UNIQUE_ID_#N **525** (described above) and audio identifiers MY_ID_#1 **520** through MY_ID_#N **530** (described above) indicating the devices to which each message is to be sent. Each individual message from list **425** further may further consist of audio, video, or pictorial message data MESSAGE_DATA_#1 **615** through MESSAGE_DATA_#N **620** (described above) for each respective device to which device **300** is sending data. Furthermore, each outgoing message has a field **715** stored in database **400** that identifies when a message has been successfully delivered to an appropriate device.

EXEMPLARY USER INTERFACES

FIG. **8** illustrates a first exemplary user interface **800** for input device **320** of device **300**. User interface **800** may consist of a number of buttons disposed on the exterior package **845** of device **300** that can be selected for control of the operation of the device. These buttons include a RECORD button **805**, a PLAY button **810**, a SEND button **815**, a NEXT button **820**, a TO button **825**, a DISCARD button **830**, an ID button **835**, and a MSG button **840**.

RECORD button **805** initiates an audio recording function in which auditory input to microphone **365** is A/D converted and stored in RAM **335**. Selection of the PLAY button **810** initiates a playback function whereby audio data stored in RAM **335** is retrieved, D/A converted, and output through speaker **360**. SEND **815** button, when selected, indicates that a designated message is to be transmitted to a particular destination wireless device. The NEXT button **820**, when selected, indicates that the user wishes to proceed to a next message or identifier in a list of messages or identifiers. Selection of the TO button **825** indicates the selection of an identifier (FRIEND_ID) in device identifier list **415**. DISCARD button **830**, when selected, discards a received message (RECEIVED_MSG) in list **420** or a FRIEND_ID in the device identifier list **415**. Selection of the ID button **835** indicates that subsequent user input to device **300** refers to received message list **420** or a device identifier list **415**. MSG button **840**, when depressed, indicates that subsequent user input to device **300** refers to outgoing message list **425**.

FIG. **9** illustrates a second exemplary user interface **900** of input device **320** in which input device **320** and output device **315** may both reside within a video display **905**. Interface **900** includes a graphical user interface displayed upon video display **905** and includes graphical display "buttons" (shown as **805–840**) for selecting the various functions described above with respect to FIG. **8**. The graphical display "buttons" can be selected using a movable cursor, a touch sensitive display screen or the like. Additionally, user interface **900** contains data field displays (**910**, **915**, **920**, **925**) that can be scrolled through, using a specified "button," to show the complete contents of data contained in lists **415**, **420**, **425**, and **430**. The graphical display buttons can also be used to select (highlight **930**) a data item.

EXEMPLARY PROCESSING FOR INITIALIZATION

FIG. **10** is a flowchart of system processing, consistent with the present invention, for initializing device **300**. For purposes of providing a specific example in the following flow charts, assume that "Sally" operates a sending device and "Jim" operates a destination device, with both sending and destination devices being substantially similar to device **300**.

Initialization consists of device processing for permitting a user of device **300** to enter an auditory word or phrase that can be used as the user device's audio identifier MY_ID **410** when communicating with other devices. Device **300** first determines if the ID button **830** has been selected [step **1005**]. If the ID button has been selected, device **300** next determines if the RECORD button **805** has also been selected [step **1010**]. If the RECORD button **805** has been selected, then auditory input received at microphone **365** is analog-to-digital converted by A/D converter **355** and transferred, via processing unit **325**, to RAM **330** for storage as MY_ID **410** [step **1015**]. RECORD button **805** can be de-selected to end the recording process [step **1020**].

Thus, if Sally or Jim desire to initialize their devices, each selects the ID function on their device and then selects the RECORD function. Sally and Jim then speak identifier phrases, such as "Sally" or "Jim" into microphone **365**. After speaking these phases, Sally and Jim de-select the RECORD function on their respective devices. Each of Sally and Jim's wireless devices respectively store audio identifiers MY_ID **410** in memory.

EXEMPLARY PROCESSING FOR INTRODUCTIONS

FIGS. **11–12** are flowcharts of system processing, consistent with the present invention, in which two wireless devices, such as Sally's and Jim's devices, are "introduced" to one another using a two-way "handshake" protocol. Before initiation of the "handshake" protocol, the two wireless devices must first be brought within transmission range of one another. Once the devices are within transmission range, a sending device determines if the device's ID button **835** has been selected [step **1105**] (FIG. **11**). If the ID

function **835** has been selected, the sending device next determines if the SEND button **815** has also been selected [step **1110**]. Sally may, thus, initiate the introduction of her device with Jim's device by selecting the ID function **835** and SEND function **815**.

Once the SEND button **815** has been selected, the sending device transmits its MY_UNIQUE_ID **405**, MY_ID **410** (e.g., auditory phrase "Sally"), and an indication that the transmission is an identification message [step **1115**]. When the destination device receives the identification message from the sending device [step **1120**], the destination device alerts the user of the destination device of the receipt of the message [step **1125**]. This alert can include an audible message, such as a chime or bell sound, and/or a vibration of the device using vibration transducer **345**.

After alerting the user, the destination device determines if the PLAY button **810** has been selected [step **1205**] (FIG. **12**). If so, the destination device retrieves speech data SPEECH_DATA_#x from database **400** and outputs the speech data, and then the sending device's audio identifier MY_ID **410**, to A/D converter **350** and speaker **360** [step **1210**]. SPEECH_DATA_#x may consist of an auditory phrase such as "Making friends with . . . ". In accordance with steps **1205–1210**, Jim may thus select the PLAY function **810** in response to an alert message from his device and hear the auditory messages "Making friends with . . . " and "Sally" corresponding to SPEECH_DATA_#x and the sending device's MY_ID **410**.

After listening to the sending device's MY_ID **410** (e.g., phrase "Sally"), the user of the destination device then may determine whether or not to accept the sending device as a "friend." If the user selects the DISCARD button **835** [step **1215**], then the destination device removes from RAM **330** the MY_UNIQUE_ID **405** and MY_ID **410** data received from the sending device [step **1225**]. If, however, the DISCARD button **835** is not selected, the sending device's MY_UNIQUE_ID **405** and MY_ID **410** are stored in list **415** of the destination device's ROM **335** as MY_UNIQUE_ID_#x and MY_ID_#x, respectively [step **1220**]. Therefore, after hearing the phrases "Making friends with . . . " and "Sally," Jim may accept Sally as a friend by neglecting to select the DISCARD function **835**.

To complete the "introduction" process, the destination device also performs steps **1105** (FIG. **11**) through **1230** (FIG. **12**) either simultaneously with, or after, the sending device. After completion of these steps by both devices, the sending and destination devices complete the "introduction" process when the ID button **835** is de-selected at both devices [step **1230**]. Sally and Jim may, thus, complete the "introduction" process by de-selecting the ID buttons **835**. Both Sally's device and Jim's device now retain the MY_UNIQUE_ID **405** and MY_ID **410** of each other's devices in memory.

EXEMPLARY PROCESSING FOR RECORDING A MESSAGE

FIGS. **13–14** are flowcharts of system processing, consistent with the present invention, in which wireless device **300** records a message. For purposes of providing a specific example, assume that Sally wishes to send a message to Jim, with whom she has previously introduced herself (described above) and that Jim's audio identifier MY_ID is the first identifier stored in list **415** (e.g., MY_ID_#1).

To record a message, device **300** first determines if the MSG function **840** has been selected [step **1305**] (FIG. **13**). Sally desires to send a message to Jim, therefore, she selects the MSG function **840**. Device **300** then retrieves the currently indexed (e.g., index=x) audio identifier (MY_ID_#x) from list **415** and outputs the identifier to D/A converter **350** and speaker **360** [step **1310**]. Sally's device retrieves Jim's identifier MY_ID_#1 from list **415** and plays the identifier. Sally hears the phrase "Jim."

Device **300** then determines if the NEXT function has been selected [step **1320**]. If so, device **300** increments index x (i.e., x=x+1) [step **1315**] and returns to step **1310**. In the case of Jim and Sally, Jim is the first identifier in list **415** and Sally, therefore, does not need to select the NEXT function **820**. If the NEXT function **820** has not been selected, then device **300** determines if the TO function **825** has been selected [step **1325**]. If so, device **300** stores the currently indexed MY_UNIQUE_ID_#x in an outgoing message [step **1330**]. Since Sally wishes to send a message to Jim, whose identifier MY_ID_#1 is currently indexed, Sally selects the TO function **825**.

Device **300** then determines if the NEXT function **820** has again been selected [step **1335**]. If so, device **300** increments index x (i.e., x=x+1) and returns to step **1310** to permit the user to send a message concurrently to two or more devices. In the example, Sally wishes to send a message only to Jim, therefore, Sally does not select the NEXT function **820**. If the NEXT function is not selected, device **300** determines if the RECORD function **805** has been selected [step **1340**]. If so, auditory input received at microphone **365** is analog-to-digital converted by A/D converter **355** and transferred, via processing unit **325**, to RAM **330** for storage as MESSAGE_DATA_#x [**1345**]. Device **300** ends the recording process after de-selection of the RECORD function **805** [step **1350**]. To record a message for Jim, Sally selects the RECORD function **805**, speaks into microphone **365**, and de-selects the RECORD function **805** when she has finished.

Device **300** next determines if the PLAY function **810** has been selected [step **1405**] (FIG. **14**). If Sally wishes to hear the message that she has recorded, she selects the PLAY function **810**. If the PLAY function **810** is selected, device **300** plays recorded message MESSAGE_DATA_#x [step **1410**]. Once playback of recorded message MESSAGE_DATA_#x completes, or the PLAY function **810** is de-selected [step **1415**], device **300** determines if the RECORD function **805** is selected [step **1420**]. If so, processing returns to step **1345** (FIG. **13**) for re-recording of message MESSAGE_DATA_#x. In the example, if Sally chooses not to re-record the message after hearing her recorded message, she does not select the RECORD function **805**. If the RECORD function **805** is not selected, device **300** determines if the SEND function **815** has been selected [step **1425**]. If so, device **300** queues MESSAGE_DATA_#x in RAM **330** for subsequent transmission [step **1430**]. Sally's message to Jim, therefore, is queued as OUTGOING_MSG_#x in database **400**.

The exemplary processing in the flowcharts of FIGS. **13–14** illustrates the recording of audio input by a device user for inclusion in a message. One skilled in the art will appreciate, however, that this processing can be modified to include user input such as video or pictorial data. Such user input can further include handwritten pictures or messages using a digital stylus and "tablet."

EXEMPLARY PROCESSING FOR SENDING A MESSAGE

FIGS. **15–16** are flowcharts of system processing, consistent with the present invention, in which device **300**

transmits a message queued in RAM **330** to a destination device. As described above, Sally's message to Jim has been queued as OUTGOING_MSG_#x in database **400**. To initiate transmission of an outgoing message, the sending device first sends a probe message to the identified device(s) [step **1505**] (FIG. **15**). The probe message may include a request to send data to the destination device(s). The sending device then determines if the destination device(s) responds with an authorization message(s) [step **1510**]. The authorization message authorizes the sending device to send the data to the destination device. If the destination device does not respond with authorization message(s), the sending device waits a configurable period of time before sending another probe message [step **1515**]. The configurable period of time may be preset by the manufacturer or set by the device user. If the destination device(s) does respond with an authorization message(s), then the sending device **300** establishes a link-layer wireless connection with the responding device using conventional mechanisms [step **1520**].

In the example, Sally's device transmits a probe message to Jim's device, which responds with an authorization message. In response to receipt of the authorization message, Sally's device establishes a link-layer wireless connection with Jim's device.

After establishing the wireless connection, the sending device **300** transmits an outgoing message (OUTGOING_MSG_#x) including MY_UNIQUE_ID **405**, MY_ID **410**, and message data MESSAGE_DATA_#x [step **1525**]. Sally's device would therefore transmit the outgoing message (OUTGOING_MSG_#x) queued in the memory of the device.

After transmission of the message, the sending device awaits receipt of a positive acknowledgment from the destination device, indicating that the destination device successfully received the message [step **1530**]. Once received, the sending device marks (field **715** in database **400**) the transmitted message as delivered [step **1605**] (FIG. **16**). The sending device then may optionally delete the transmitted message from database **400** [step **1610**]. In the example, Sally's device awaits, after transmitting OUTGOING_MSG_#x, receipt of the positive acknowledgment from Jim's device. When the acknowledgment is received, Sally's device marks the transmitted message as delivered in field **715** of database **400**.

EXEMPLARY PROCESSING FOR RECEIVING A MESSAGE

FIGS. **17–19** are flowcharts of system processing, consistent with the present invention, for receiving a message at a destination device. The destination device receives a probe message from the sending device indicating that the sending device wishes to transmit a message to the destination device [step **1705**] (FIG. **17**). The destination device then compares the MY_UNIQUE_ID contained in the probe message from the sending device with the identifiers contained in the destination device's list **415** [step **1710**]. If the sending device's MY_UNIQUE_ID matches an identifier within list **415** [step **1715**], then the destination device responds with an authorization message to the sending device [step**1735**]. If no match is found, the destination device responds with a non-authorization message to the sending device [step **1720**]. The non-authorization message indicates that the destination device will not accept a message from the sending device.

In the example, Jim's device receives a probe message from Sally's device. Since Jim and Sally have previously been introduced, the Sally's MY_UNIQUE_ID contained in the probe message matches an identifier previously stored in list **415**. Jim's device therefore responds with an authorization message.

Optionally, the destination device may respond with an authorization message even if the sending device's MY_UNIQUE_ID does not match any identifiers in the destination device's list **415** [step **1725**]. This may be advantageous in a multi-hop wireless network where point-to-point connectivity between a sending device and a destination device may be impracticable. Therefore, in such a wireless network, each device in the network may route messages, hop by hop, to intended destination devices. To forward messages intended for other wireless devices, the user of the destination may initiate a "forwarding" mode. If the "forwarding" mode has been initiated, the destination device receives a message from the sending device in response to the authorization message [step **1730**] and then forwards the received message on to the intended destination device [step **1805**] (FIG. **18**). In the example, assuming that Jim's device receives a message from a device used by Bob, and the message is intended for Henry, Jim's device may forward the message on to Henry's device.

Returning to step **1715**, the destination device determines if the sending device's MY_UNIQUE_ID matches an identifier within list **415**. If so, the destination device responds with an authorization message to the sending device [step**1735**]. In response to the authorization message, the destination device **300** receives a message from the sending device [step **1740**]. The destination device alerts the device user that a message was received [step **1810**] (FIG. **18**). The destination device then determines if the PLAY button **810** has been selected [step **1815**]. If so, the destination device plays the MY_ID_#x and MESSAGE_DATA_#x contained in the message received from the sending device (RECEIVED_MSG_#x) [step **1820**]. In the example, Jim's device receives the message sent by Sally and then alerts Jim that the message has been received. In response to the alert, Jim selects the PLAY function **810** and listens to Sally's MY_ID audio identifier and Sally's message MESSAGE_DATA_#x.

The destination device user then may have the following options: 1) maintain the message in memory; 2) delete the message; 3) reply to the message; or 4) forward the message on to other devices. The destination device determines if the MSG button **840** has been selected indicating that the user desires to forward the message on to another device(s) [step **1830**]. If not, then the destination device determines if the RECORD button **805** has been selected indicating that the user desires to reply to the received message [step **1835**]. If the RECORD button **805** has been selected, then the destination device permits the user to reply to the message by performing message recording processing beginning at step **1325** of FIG. **13**. However, if the RECORD button **805** has not been selected, then the destination device determines if the DISCARD function **830** has been selected [step **1840**] indicating that the user desires to delete the received message. If the DISCARD function **830** has not been selected, the message receiving processing is completed, with the device retaining the received message in memory. If the DISCARD function **830** has been selected, the destination device deletes the sending device's RECEIVED_MSG_#x from memory [step **1845**].

If, at step **1830**, the destination device determines that the MSG button **840** has been selected, then the destination device permits the user to forward the message to other devices by continuing processing at step **1850**. At this step,

the destination device determines if the TO function **825** has been selected. If so, the destination device adds the selected FRIEND_ID as a destination identifier in an outgoing message [step **1905**] (FIG. **19**).

The destination device then determines if the NEXT function **820** has been selected [step **1910**] indicating that the device user desires to select another device to receive the forwarded message. If so, the destination device continues processing at step **1850** (FIG. **18**). If not, then the destination device determines if the SEND function **815** has been selected [step **1915**]. If the SEND function **815** has been selected, the destination device queues the outgoing message for subsequent delivery [step **1920**] (see "Message Sending Processing" of

Returning to the example, Jim, after listening to the message from Sally, elects to delete the message from memory, instead of replying to the message or forwarding the message, and therefore selects the DISCARD function **830**.

EXEMPLARY PROCESSING FOR RE-INITIALIZATION

FIGS. **20–21** are flowcharts of system processing, consistent with the present invention, for re-initializing device **300**. A user of device **300** may wish to re-initialize device **300** by removing MY_UNIQUE_ID **405** and all received messages (RECEIVED_MSG_#1 **605** through RECEIVED_MSG_#N **610**) that have been stored in database **400**. To re-initialize, device **300** determines if the MSG function **835** has been selected by the device user [step **2005**] (FIG. **20**). If so, device **300** determines if the DISCARD button **830** has further been selected [step **2010**] indicating that the user desires to delete a received message from memory. If the DISCARD button **830** has been selected, device **300** deletes a current received message (RECEIVED_MSG_#x) stored in database **400** [step **2015**]. Device **300** then determines if the message just discarded is the last received message [step **2020**]. If not, processing returns to step **2010**.

In the example, Jim may partially re-initialize his device by first selecting the MSG function **840** and then repeatedly selecting the DISCARD function **830** until all of the received messages have been deleted from memory.

To re-initialize the device identifiers (FRIEND_ID_#1 **505**–FRIEND_ID_#N **510**), device **300** determines if the user has selected the ID function **835** [step **2105**] (FIG. **21**). If so, device **300** next determines if the DISCARD button **830** has been selected, indicating that the device user desires to delete a device identifier from memory [step **2110**]. If so, device **300** deletes a current FRIEND_ID_#x in list **415** [step **2115**]. Device **300** concludes re-initialization processing when the most recently deleted identifier is the last identifier in list **415** [step **2120**].

In the example, Jim may complete the re-initialization of his device by selecting the ID function **835** and then repeatedly selecting the DISCARD function **830** until all of the device identifiers have been deleted from memory.

CONCLUSION

Systems and methods consistent with the present invention provide mechanisms that improve the delivery of messages in wireless networks by permitting temporary storage of messages in a sending device followed by the transmission or re-transmission of the messages when the destination device(s) comes within the transmission range of the sending device.

The foregoing description of exemplary embodiments of the present invention provides illustration and description, but is not intended to be exhaustive or to limit the invention to the precise form disclosed. Modifications and variations are possible in light of the above teachings or may be acquired from practice of the invention. For example, while a series of steps have been presented with regard to the processing of FIGS. **10–21**, the order of the steps does not matter.

In addition, while communication between wireless devices in the exemplary embodiments above has been disclosed as occurring directly across an air interface, communication between wireless devices may also occur across a cellular infrastructure and through a data network (e.g., the Internet). Such communication would allow messages to be stored on a data server connected to the data network. Storing the messages on a data server would permit wireless device users to archive voice recordings and mail recordings to other wireless devices. This would further advantageously permit wireless devices to exchange messages with other wireless devices anywhere in the world across the data network.

Furthermore, though the exemplary processing described above uses audio data as unique identifiers for each device, one skilled in the art will appreciate that the unique identifiers can include digital video or digital pictorial data. For example, a digital "stylus and tablet" can be associated with transceiver and processing circuitry to permit entry of handwritten pictures (e.g., signatures) for transmission as a MY_UNIQUE_ID device identifier. As another example, a digital camera can be associated with transceiver and processing circuitry to permit the entry of digital pictures (e.g., portraits) for transmission as a MY_UNIQUE_ID device identifier. As an additional example, a digital camcorder can be associated with transceiver and processing circuitry to permit the entry of digital video (e.g., video of the device user) for transmission as a MY_UNIQUE_ID device identifier. The transceiver and processing circuitry may be contained integrally within the digital "stylus and tablet," digital camera, or digital camcorder. The digital "stylus and tablet," camera, and camcorder can also be separate devices interconnected with device **300** so as to permit device **300** to download pictorial or video data.

The exemplary processing described above can be adapted to permit the entry and use of digital video or pictorial data, instead of audio data, for identifying devices. For example, when selecting a destination device for sending a message, a device user could scroll through digital pictures corresponding to other "friend" devices, instead of listening to audio identifiers, to select a message destination. As another example, the exemplary "initialization" processing, described above with respect to FIG. **10**, can be adapted to permit the entry and storage of video or pictorial data from MY_UNIQUE_ID instead of recording a verbal phrase. Additionally, audio identifiers MY_UNIQUE_ID_AUDIO and video/pictorial identifiers MY_UNIQUE_ID_PIC can be used together for identifying a device. For example, when selecting a device as a destination for a message, a device user can scroll through digital pictures corresponding to other "friend" devices and hear the audio identifier associated with each visual picture.

The scope of the invention is defined by the following claims and their equivalents.

What is claimed is:

1. A method for introducing a first communication device to a second communication device in a communication network comprising:

transmitting a message from the first communication device, said message comprising presentation data that further comprises at least one of audio, pictorial and video data representing an identity of the first communication device;

receiving said message at the second communication device;

extracting the presentation data from the message;

presenting the presentation data to a user of the second communication device in auditory or visual form;

receiving user input in response to said presentation; and

storing said presentation data, as an identifier for the first communication device, in a memory of the second communication device based on said user input.

2. The method of claim **1**, further comprising:

deleting said message from said memory based on said user input.

3. A system for introducing a first communication device to a second communication device in a communication network comprising:

means for transmitting a message from the first communication device, said message comprising presentation data that further comprises at least one of audio, pictorial and video data representing an identity of the first communication device;

means for receiving said message at the second communication device;

means for extracting the presentation data from the message;

means for presenting the presentation data to a user of the second communication device in auditory or visual form;

means for receiving user input in response to said presentation; and

means for storing said presentation data, as an identifier for the first communication device, in a memory of the second communication device based on said user input.

4. A data structure encoded on a computer readable medium, comprising:

first identifier data indicating a global identification of a first communication device; and

second identifier data comprising presentation data, said presentation data further comprising at least one of audio, pictorial and video data representing an identity of the first communication device.

5. The data structure of claim **4**, further comprising:

third identifier data indicating a global identification of a second communication device; and

fourth identifier data comprising presentation data, said presentation data further comprising at least one of audio, pictorial and video data representing an identity of the second communication device.

6. The data structure of claim **5**, further comprising:

message data comprising a message from said first communication device to said second communication device.

7. A method of providing an identifier for a communication device, comprising:

inputting at least one of auditory, pictorial and video information into the communication device;

converting said at least one of auditory, pictorial, and video information into device identifier data; and

storing said device identifier data in a memory of said communication device.

8. The method of claim **7**, wherein said auditory information is a verbal phrase spoken by a device user.

9. The method of claim **7**, wherein said pictorial information comprises a digital representation of a device user's handwriting.

10. The method of claim **7**, wherein said pictorial information comprises a digital portrait of a device user.

11. The method of claim **7**, wherein said video information comprises video of a device user.

12. A computer-readable medium containing instructions for controlling at least one processor to perform a method of providing an identifier for a communication device, the method comprising:

inputting at least one of auditory, pictorial and video information into the communication device;

converting said at least one of auditory, pictorial and video information into device identifier data; and

storing said device identifier data in a memory of said communication device.

13. The computer-readable medium of claim **12**, wherein said auditory information is a verbal phrase spoken by a device user.

14. The computer-readable medium of claim **12**, wherein said pictorial information comprises a digital representation of a device user's handwriting.

15. The computer-readable medium of claim **12**, wherein said pictorial information comprises a digital portrait of a device user.

16. The computer-readable medium of claim **12**, wherein said video information comprises video of a device user.

17. A communication device comprising:

a memory;

an input device configured to receive at least one of auditory, pictorial and video information; and

a processor configured to:

convert said at least one of auditory, pictorial and video information into device identifier data, and

store said device identifier data in the memory.

18. The communication device of claim **17**, wherein said auditory information is a verbal phrase spoken by a device user.

19. The communication device of claim **17**, wherein said pictorial information comprises a digital representation of a device user's handwriting.

20. The communication device of claim **17**, wherein said pictorial information comprises a digital portrait of a device user.

21. The communication device of claim **17**, wherein said video information comprises video of a device user.

22. A method of sending a message to one or more recipients in a communications network, comprising:

retrieving device identifiers from a list of device identifiers stored in a memory of a first communication device, said device identifiers comprising at least one of audio, pictorial and video data;

presenting the at least one of audio, pictorial and video data to a user of the first communication device in auditory or visual form;

receiving user input in response to said presentation;

designating a second communication device as a destination for the message based on said user input; and

sending the message to the second communication device.

23. The method of claim **22**, further comprising:

designating other communication devices as destinations for the message based on said user input.

24. A computer-readable medium containing instructions for controlling at least one processor to perform a method of sending a message to one or more recipients in a communications network, the method comprising:

retrieving device identifiers from a list of device identifiers stored in a memory of a first communication device, said device identifiers comprising at least one of audio, pictorial and video data,

presenting the at least one of audio, pictorial and video data to a user of the first communication device in auditory or visual,

receiving user input in response to said presentation,

designating a second communication device as a destination for the message based on said user input, and

sending the message to the second communication device.

25. The computer-readable medium of claim **24**, the method further comprising:

designating other communication devices as destinations for the message based on said user input.

26. A first communication device comprising:

a memory configured to store a list of identifiers; and

a processor configured to:

retrieve device identifiers from the list of device identifiers stored in the memory, said device identifier comprising at least one of audio, pictorial and video data,

present the at least one of audio, pictorial and video data to a user of the first communication device in auditory or visual form,

receive user input in response to said presentation,

designate a second communication device as a destination for the message based on said user input, and

send the message to the second communication device.

27. The first communication device of claim **26**, the processor further configured to:

designate other communication devices as destinations for the message based on said user input.

28. A method of authorizing transmission of a message from a first communication device to a second communication device in a communications network, comprising:

receiving a request to send a message from the first communication device, said request containing a device identifier identifying the first communication device; and

sending an authorization message to said first communication device authorizing said first communication device to send said message if said device identifier matches any identifiers from a list of identifiers stored in a memory in said second communication device.

29. A computer-readable medium containing instructions for controlling at least one processor to perform a method of authorizing transmission of a message from a first communication device to a second communication device in a communications network, the method comprising:

receiving a request to send a message from the first communication device, said request containing a device identifier identifying the first communication device; and

sending an authorization message to said first communication device authorizing said first communication device to send said message if said device identifier matches any identifiers from a list of identifiers stored in a memory of said second communication device.

30. A first communication device, comprising:

a processor configured to:

receive a request to send a message from a second communication device, said request containing a device identifier identifying the second communication device, and

send an authorization message to said second communication device authorizing said second communication device to send said message if said device identifier matches any identifiers from a list of identifiers stored in a memory of said first communication device.

31. A method of forwarding a message received at a first communication device in a communications network, comprising:

receiving a message at the first communication device;

retrieving device identifiers from a list of device identifiers stored in a memory of the first communication device, said device identifier comprising at least one of audio, pictorial and video data;

presenting the at least one of audio, pictorial and video data to a user of the first communication device in auditory or visual form;

receiving user input in response to said presentation;

designating a second communication device as a forwarding destination for the message based on said user input; and

forwarding the message to the second communication device.

32. The method of claim **31**, wherein said auditory information is a verbal phrase spoken by a device user.

33. The method of claim **31**, wherein said pictorial information comprises a digital representation of a device user's handwriting.

34. The method of claim **31**, wherein said pictorial information comprises a digital portrait of a device user.

35. The method of claim **31**, wherein said video information comprises video of a device user.

36. A computer-readable medium containing instructions for controlling at least one processor to perform a method of forwarding a message received at a first communication device in a communications network, the method comprising:

receiving a message at the first communication device;

retrieving device identifiers from a list of device identifiers stored in a memory of the first communication device, said device identifier comprising at least one of audio, pictorial and video data;

presenting the at least one of audio, pictorial data and video to a user of the first communication device in auditory or visual form;

receiving user input in response to said presentation; and

designating a second communication device as a forwarding destination for the message based on said user input.

37. The computer-readable medium of claim **36**, wherein said auditory information is a verbal phrase spoken by a device user.

38. The computer-readable medium of claim **36**, wherein said pictorial information comprises a digital representation of a device user's handwriting.

39. The computer-readable medium of claim **36**, wherein said pictorial information comprises a digital portrait of a device user.

40. The computer-readable medium of claim **36**, wherein said video information comprises video of a device user.

41. A communication device comprising:

an input device;

a memory configured to store device a list of device identifiers; and

a processor configured to:

receive a message at the first communication device,

retrieve device identifiers from the list of device identifiers stored in the memory, said device identifiers comprising at least one of audio, pictorial and video data,

present the audio, pictorial and video data to a user of the first communication device in auditory or visual form,

receive user input in response to said presentation via the input device, and

designate a second communication device as a forwarding destination for the message based on said user input.

42. The communication device of claim 41, wherein said auditory information is a verbal phrase spoken by a device user.

43. The communication device of claim 41, wherein said pictorial information comprises a digital representation of a device user's handwriting.

44. The communication device of claim 41, wherein said pictorial information comprises a digital portrait of a device user.

45. The communication device of claim 41, wherein said video information comprises video of a device user.

46. A method of transmitting a message from a first communication device to one or more recipients in a communications network, comprising:

retrieving device identifiers from a list of device identifiers stored in a memory of the first communication device, said device identifiers comprising at least one of audio, pictorial and video data;

presenting the at least one of audio, pictorial and video data to a user of the first communication device in auditory or visual form;

receiving user input in response to said presentation;

designating a second communication device as a forwarding destination for the message based on said user input;

queuing said message in the memory of said first communication device;

transmitting a request to send a message to the second communication device, said request containing a device identifier identifying the first communication device;

receiving an authorization message from said second communication device authorizing said first communication device to send said message;

retrieving said queued message from the memory of said first communication device; and

transmitting said message to said second communication device.

47. The method of claim 46, further comprising:

designating one or more other communication devices as destinations for the message based on said user input;

transmitting requests to send said message to the one or more other communication devices, said requests containing a device identifier identifying the first communication device;

receiving authorization messages from said one or more other communication devices authorizing said first communication device to send said message;

retrieving said queued message from the memory of said first communication device; and

transmitting said message to said one or more other communication devices.

48. A communication network, comprising:

at least one first communication device configured to:

transmit at least one authorization message in response to receiving a request to send a message; and

a second communication device configured to:

retrieve device identifiers from a list of device identifiers stored in a memory, said device identifiers comprising at least one of audio, pictorial and video data,

present the at least one of audio, pictorial and video data to a user of the second communication device in auditory or visual form,

receive user input in response to said presentation,

designate said at least one first communication device as a forwarding destination for the message based on said user input,

queue said message in the memory,

transmit said request to send a message to the at least one first communication device, said request containing a device identifier identifying the at least one first communication device,

receive said at least one authorization message from said at least one first communication device authorizing said second communication device to send said message,

retrieve said queued message from the memory, and

transmit said message to said second communication device.

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