US009270799B2

(12) **United States Patent**
**Yuen et al.**

(10) **Patent No.: US 9,270,799 B2**
(45) **Date of Patent: Feb. 23, 2016**

(54) **USING INDIRECT COMMUNICATION TO PROVIDE A SOLUTION TO USE INTERNATIONAL DIALING CONVENTION AND INCORPORATING PHONE NUMBERS FOR NON-PHONE DEVICES**

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(73) Assignee: **WIRELESS WONDERS LTD.**, Tortola (VG)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 166 days.

(21) Appl. No.: **13/680,930**

(22) Filed: **Nov. 19, 2012**

(65) **Prior Publication Data**

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**Related U.S. Application Data**

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(60) Provisional application No. 61/676,457, filed on Jul. 27, 2012, provisional application No. 61/670,938, filed on Jul. 12, 2012, provisional application No. 60/840,005, filed on Aug. 25, 2006.

(51) **Int. Cl.**
***H04M 1/253*** (2006.01)
***H04M 3/56*** (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ........... ***H04M 1/2535*** (2013.01); ***H04L 61/304*** (2013.01); ***H04L 61/605*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC ............ H04M 15/00; H04M 15/8044; H04M 2215/2026; H04M 2215/32; H04M 2215/42; H04M 2215/745; H04M 15/56; H04M 15/80; H04M 2203/2016; H04W 4/22; H04W 4/24; H04W 4/26; H04W 76/007; H04W 76/02
USPC .......................................................... 370/352
See application file for complete search history.

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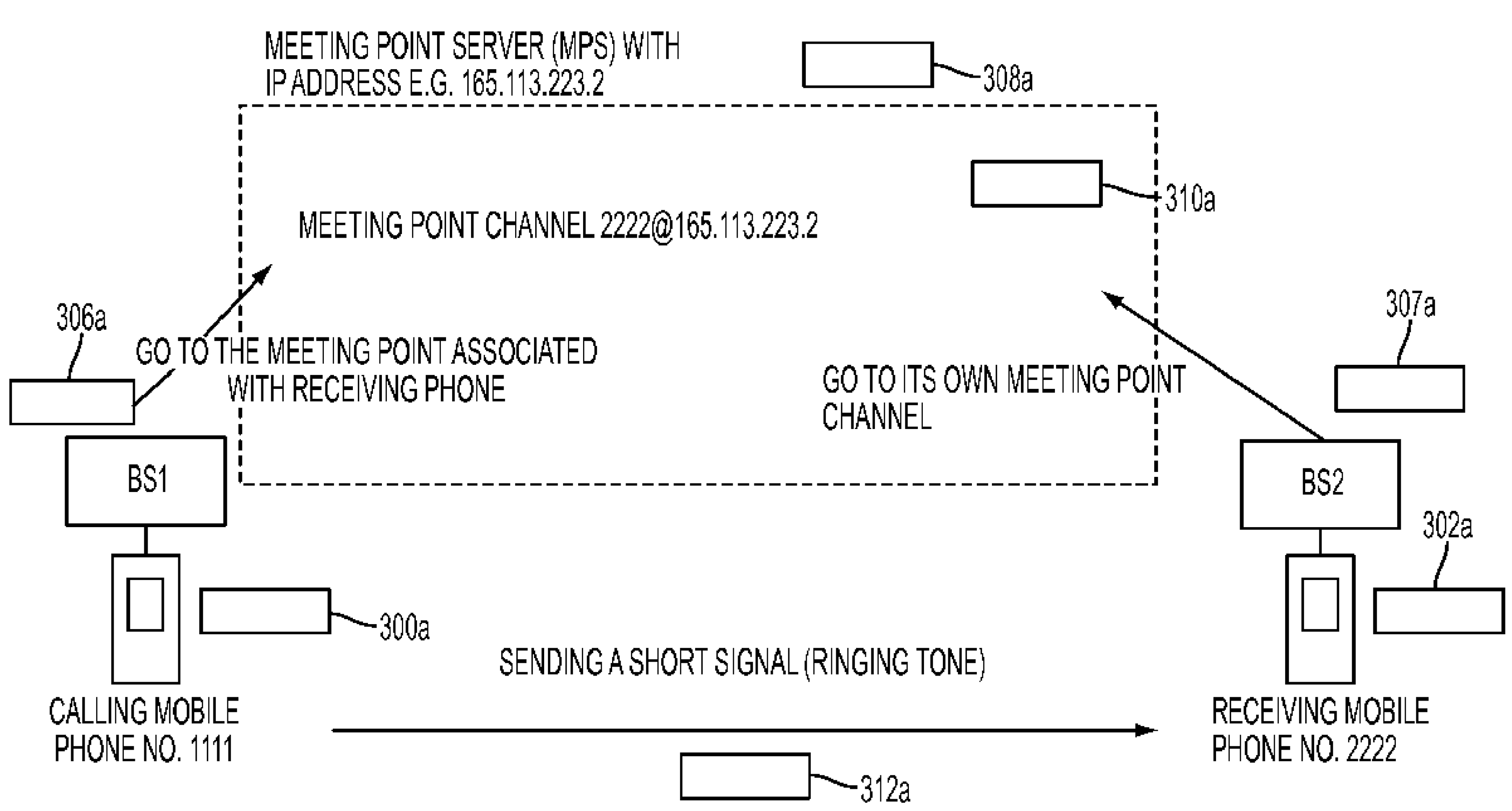
*Primary Examiner* — Edan Orgad
*Assistant Examiner* — Emmanuel Maglo

(57) **ABSTRACT**

An indirect communication system and a method of indirect communication include a mobile phone as either a calling device or receiving device. The mobile phone calls another device to set up a prospective communication, and then uses Voice over Internet Protocol (VoIP) to communicate with the other device over the Internet. The receiving device receives a generated signal notifying the receiving device of a proposed communication with the calling device. A server sets up a meeting point channel after the calling device has connected to the server. The server receives outgoing VoIP packets from the calling device and redirects the outgoing VoIP packets to the receiving device.

**18 Claims, 36 Drawing Sheets**



(51) **Int. Cl.**

| | |
|---|---|
| ***H04L 29/06*** | (2006.01) |
| ***H04W 4/20*** | (2009.01) |
| *H04W 68/00* | (2009.01) |
| *H04W 76/02* | (2009.01) |
| *H04W 88/04* | (2009.01) |
| *H04L 29/12* | (2006.01) |

(52) **U.S. Cl.**
CPC ........... ***H04L65/1069*** (2013.01); ***H04M 3/567*** (2013.01); ***H04W 4/20*** (2013.01); *H04L 61/1511* (2013.01); *H04L 69/22* (2013.01); *H04W 68/00* (2013.01); *H04W 76/02* (2013.01); *H04W 88/04* (2013.01)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| WO | 2005/081962 | 9/2005 |
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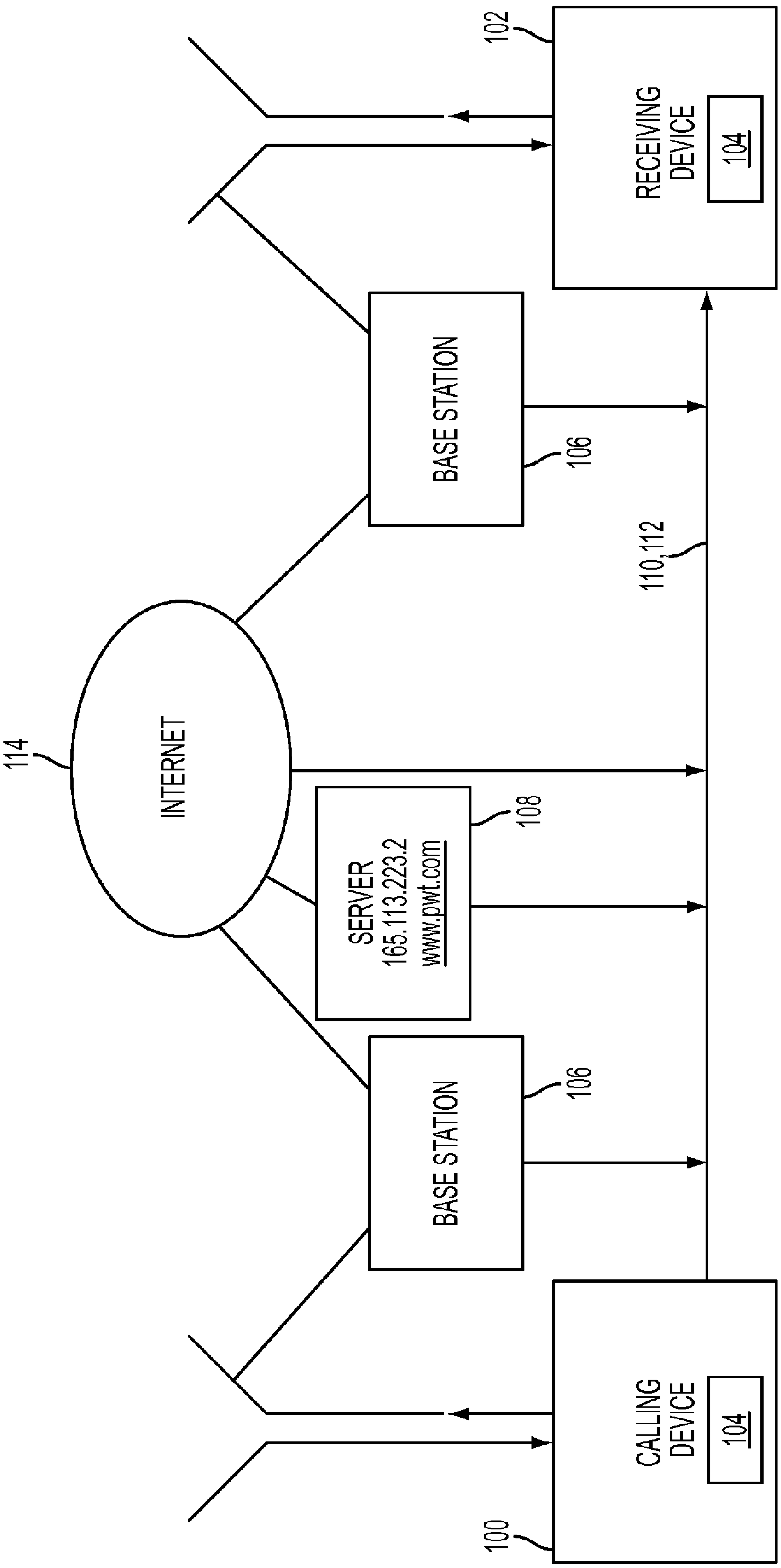

102
RECEIVING DEVICE
104
BASE STATION
106
110,112
114
INTERNET
SERVER
165.113.223.2
www.pwt.com
108
BASE STATION
106
CALLING DEVICE
104
100

FIG. 1

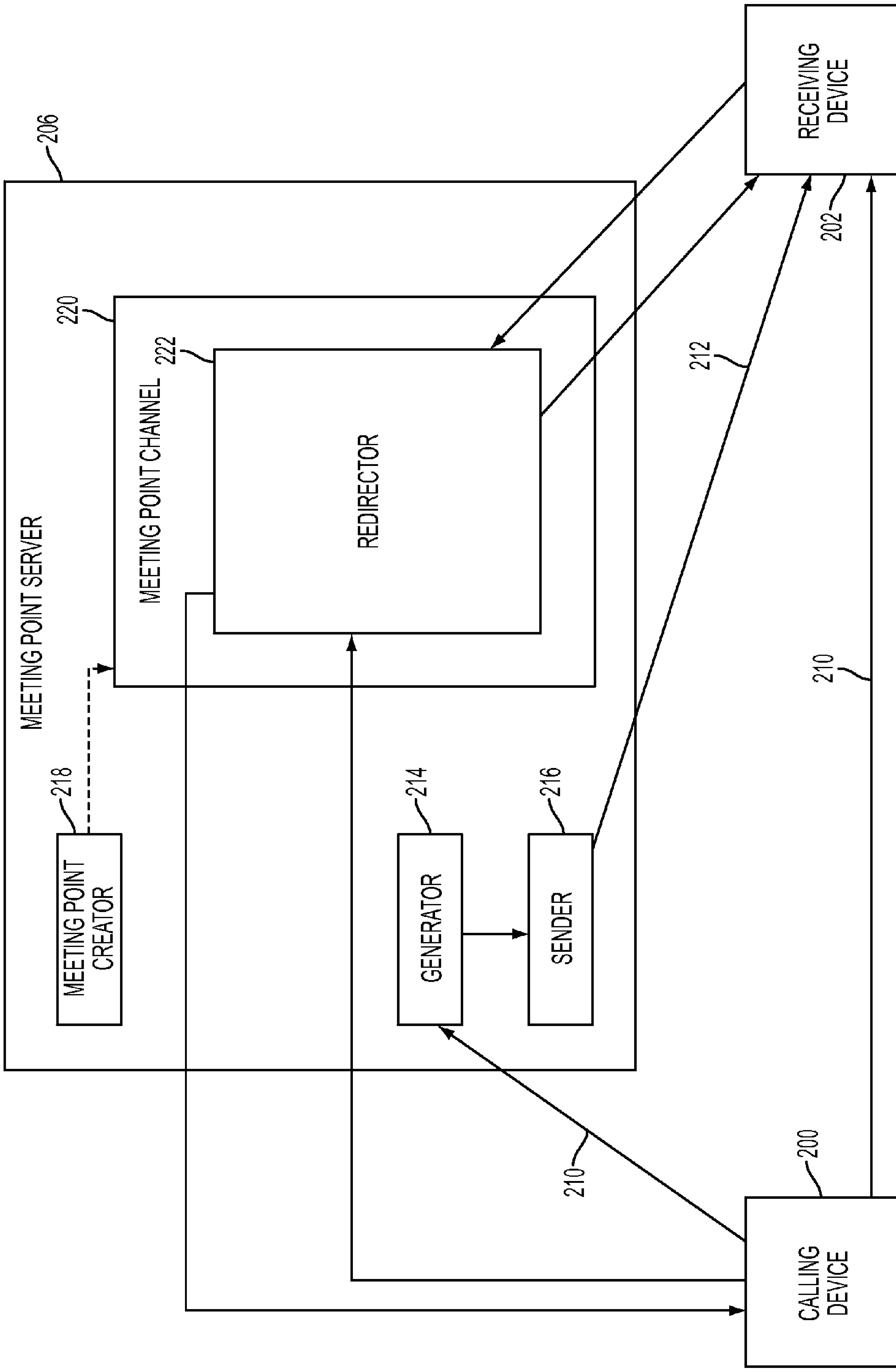

206
MEETING POINT SERVER
220
MEETING POINT CHANNEL
222
REDIRECTOR
218
MEETING POINT CREATOR
214
GENERATOR
216
SENDER
RECEIVING DEVICE
202
212
210
210
200
CALLING DEVICE

FIG. 2

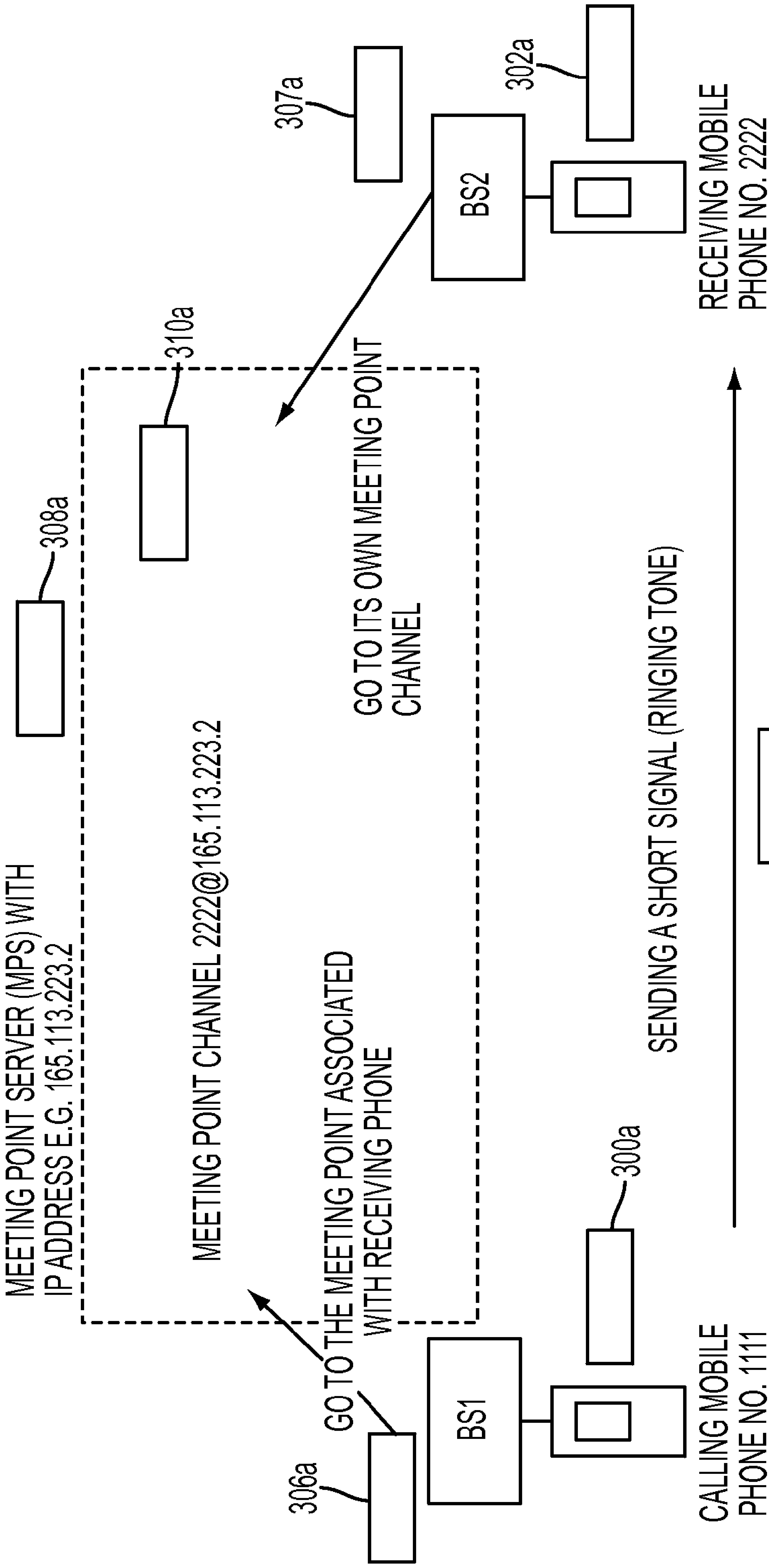

MEETING POINT SERVER (MPS) WITH IP ADDRESS E.G. 165.113.223.2
308a
310a
307a
302a
BS2
RECEIVING MOBILE PHONE NO. 2222
MEETING POINT CHANNEL 2222@165.113.223.2
GO TO ITS OWN MEETING POINT CHANNEL
GO TO THE MEETING POINT ASSOCIATED WITH RECEIVING PHONE
SENDING A SHORT SIGNAL (RINGING TONE)
312a
300a
306a
BS1
CALLING MOBILE PHONE NO. 1111

FIG. 3A

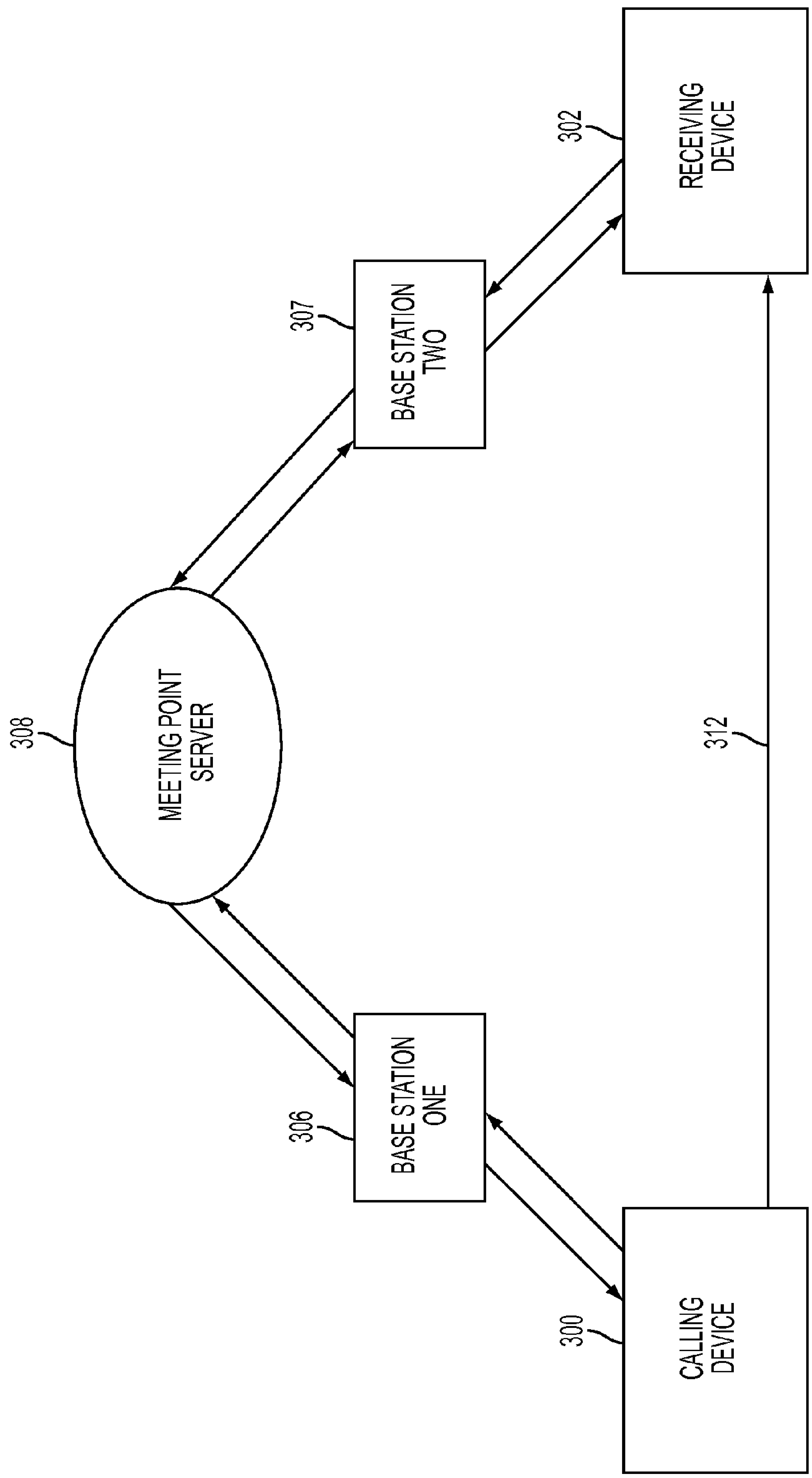
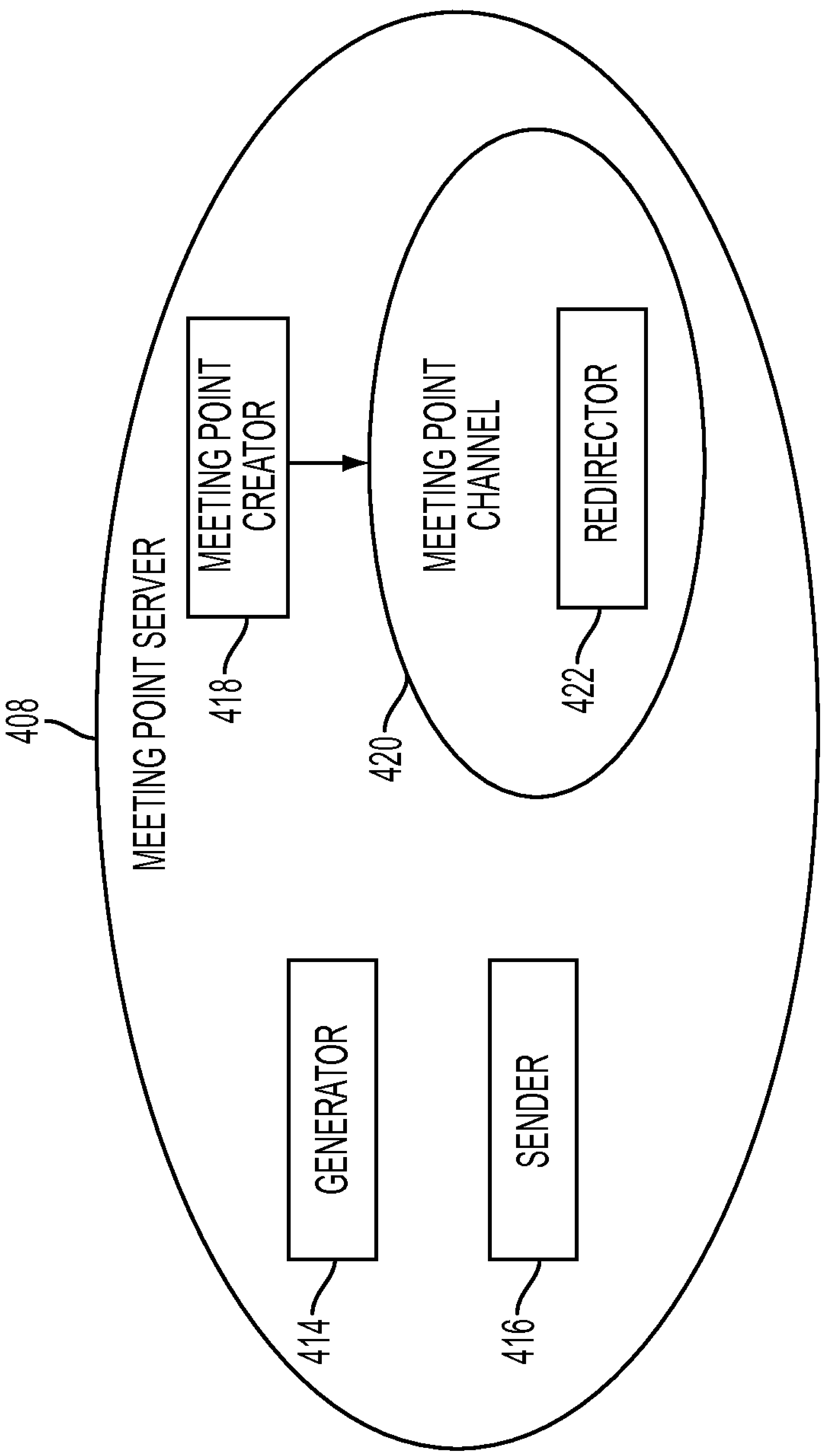

RECEIVING DEVICE
302
BASE STATION TWO
307
MEETING POINT SERVER
308
312
BASE STATION ONE
306
CALLING DEVICE
300

FIG. 3B


408
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MEETING POINT CREATOR
418
MEETING POINT CHANNEL
420
REDIRECTOR
422
GENERATOR
414
SENDER
416

FIG. 4

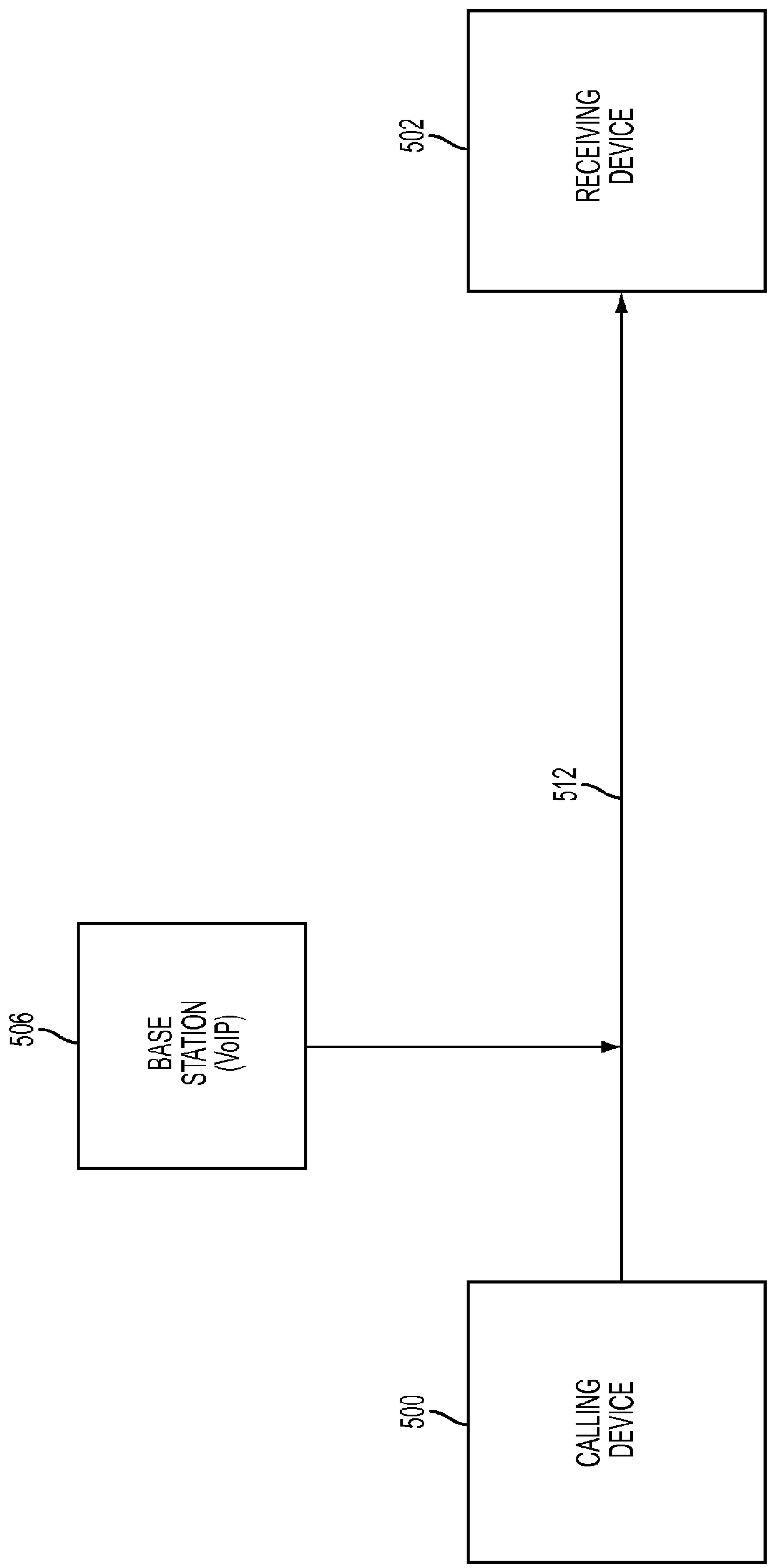

502
RECEIVING DEVICE
512
506
BASE STATION (VoIP)
500
CALLING DEVICE

FIG. 5

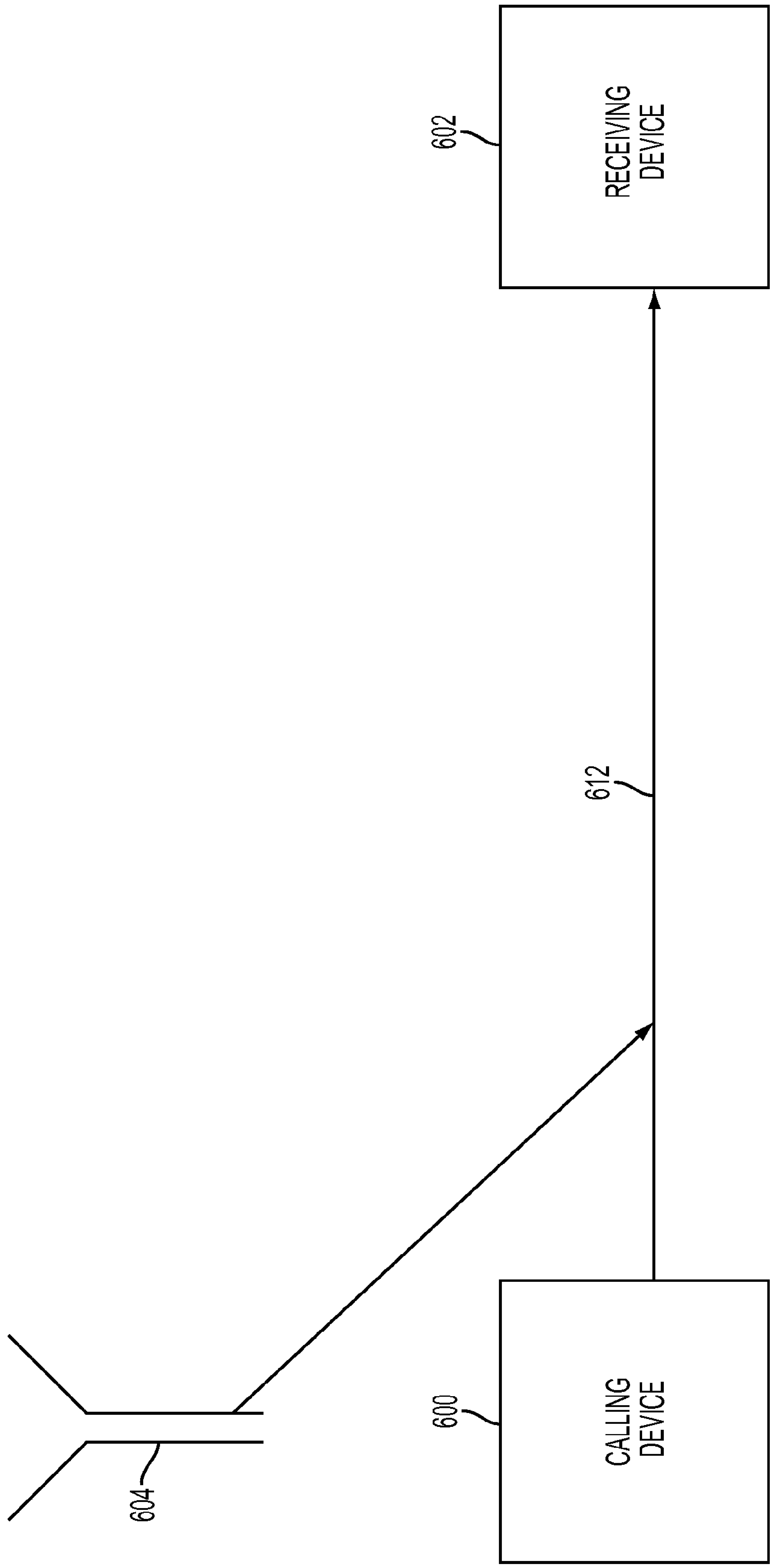



FIG. 6

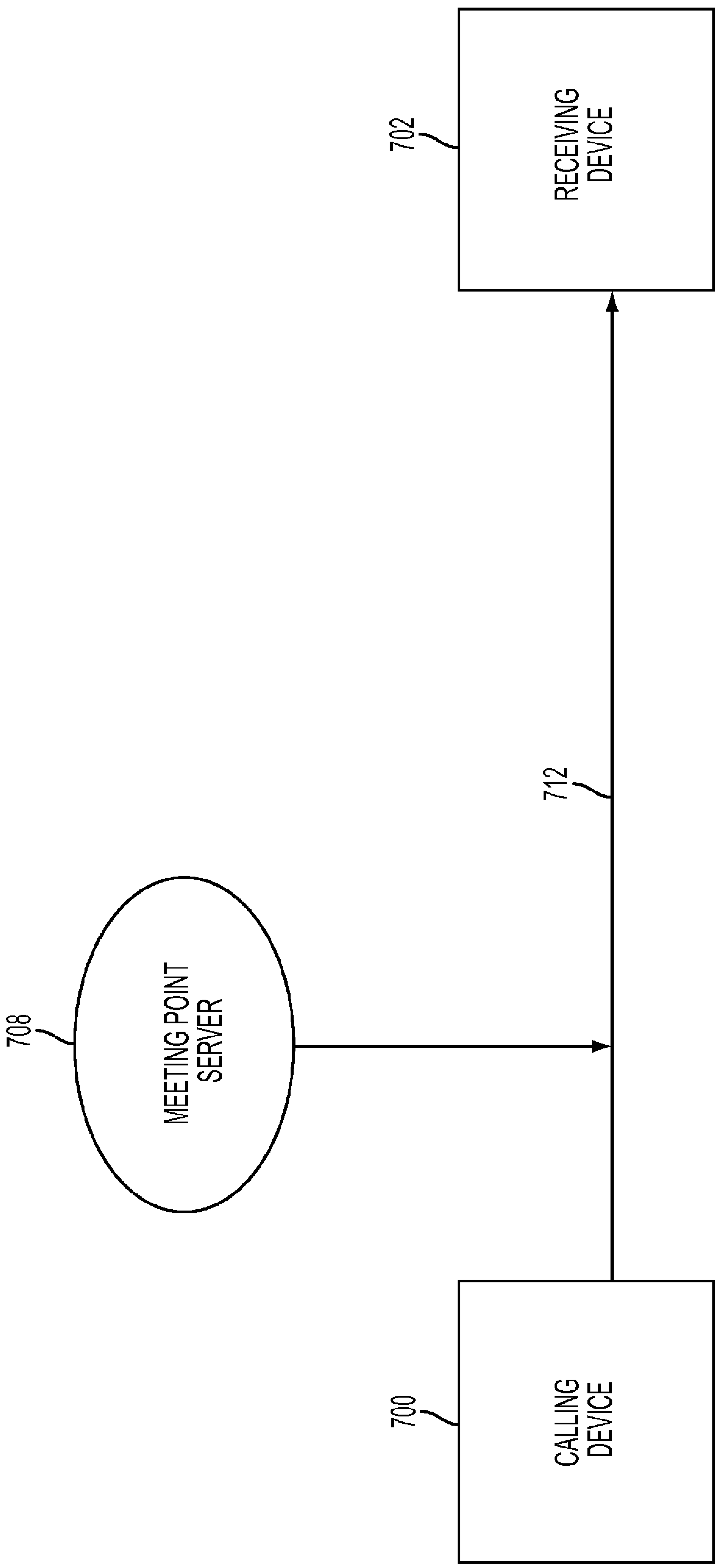

702
RECEIVING DEVICE
712
708
MEETING POINT SERVER
700
CALLING DEVICE

FIG. 7

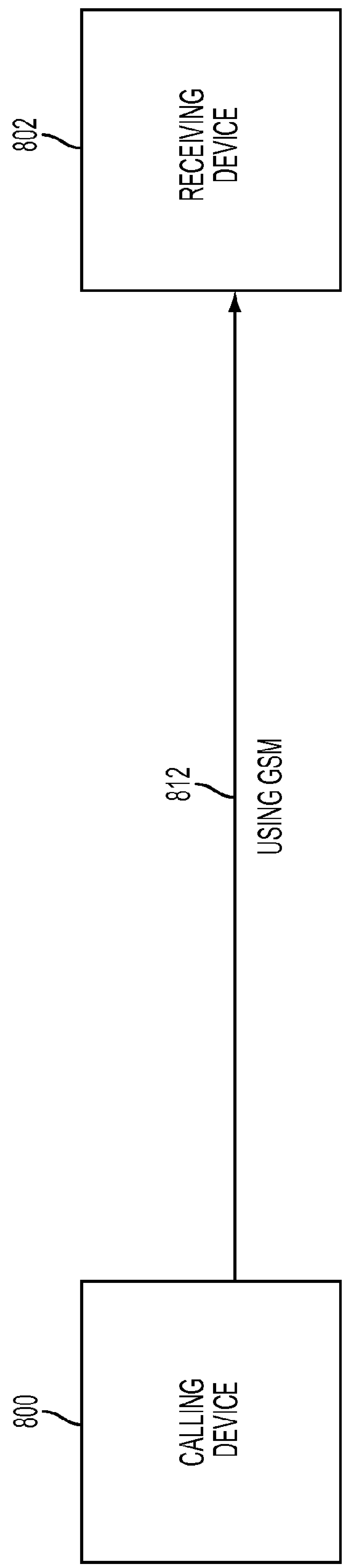



FIG. 8

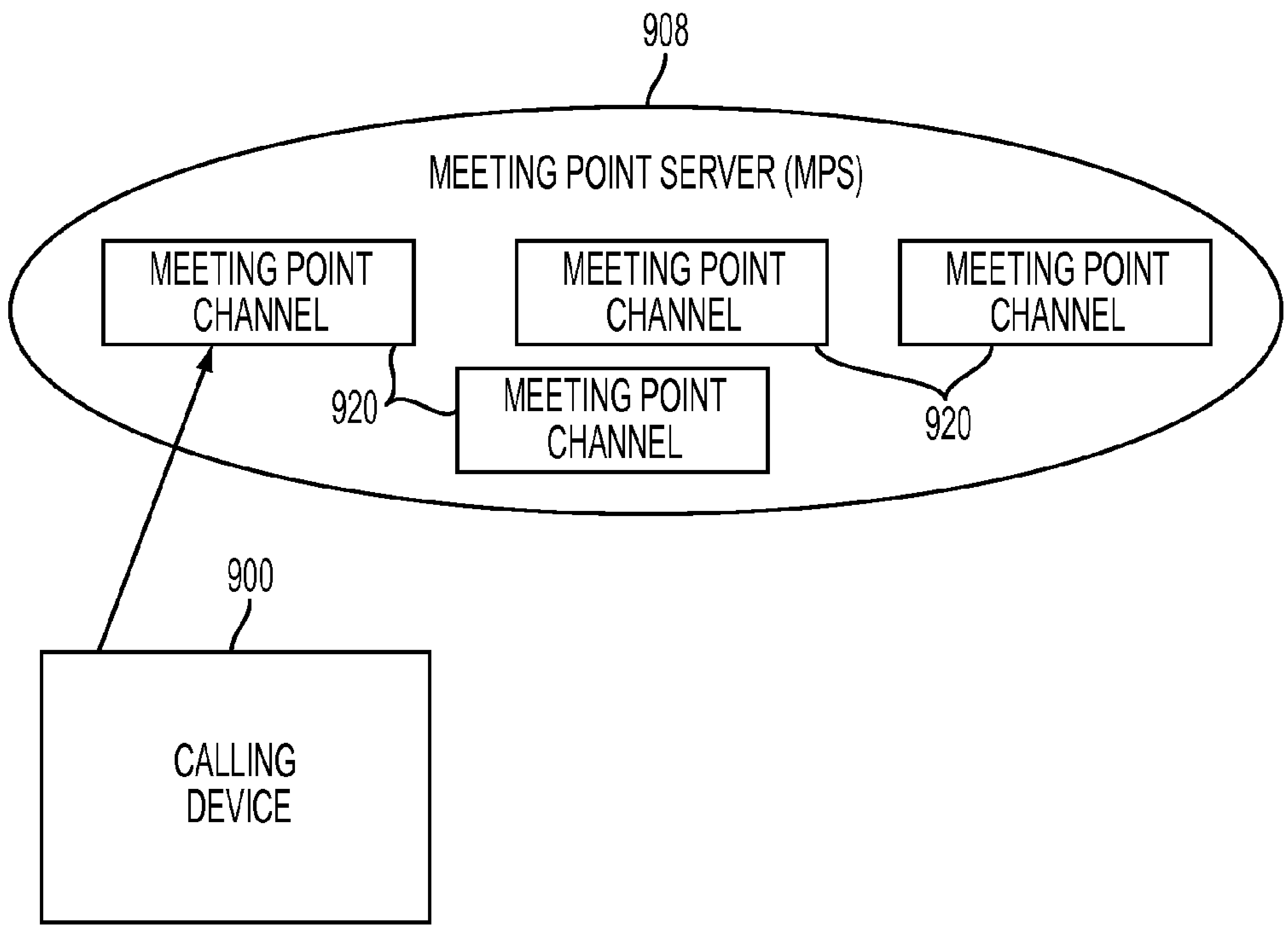
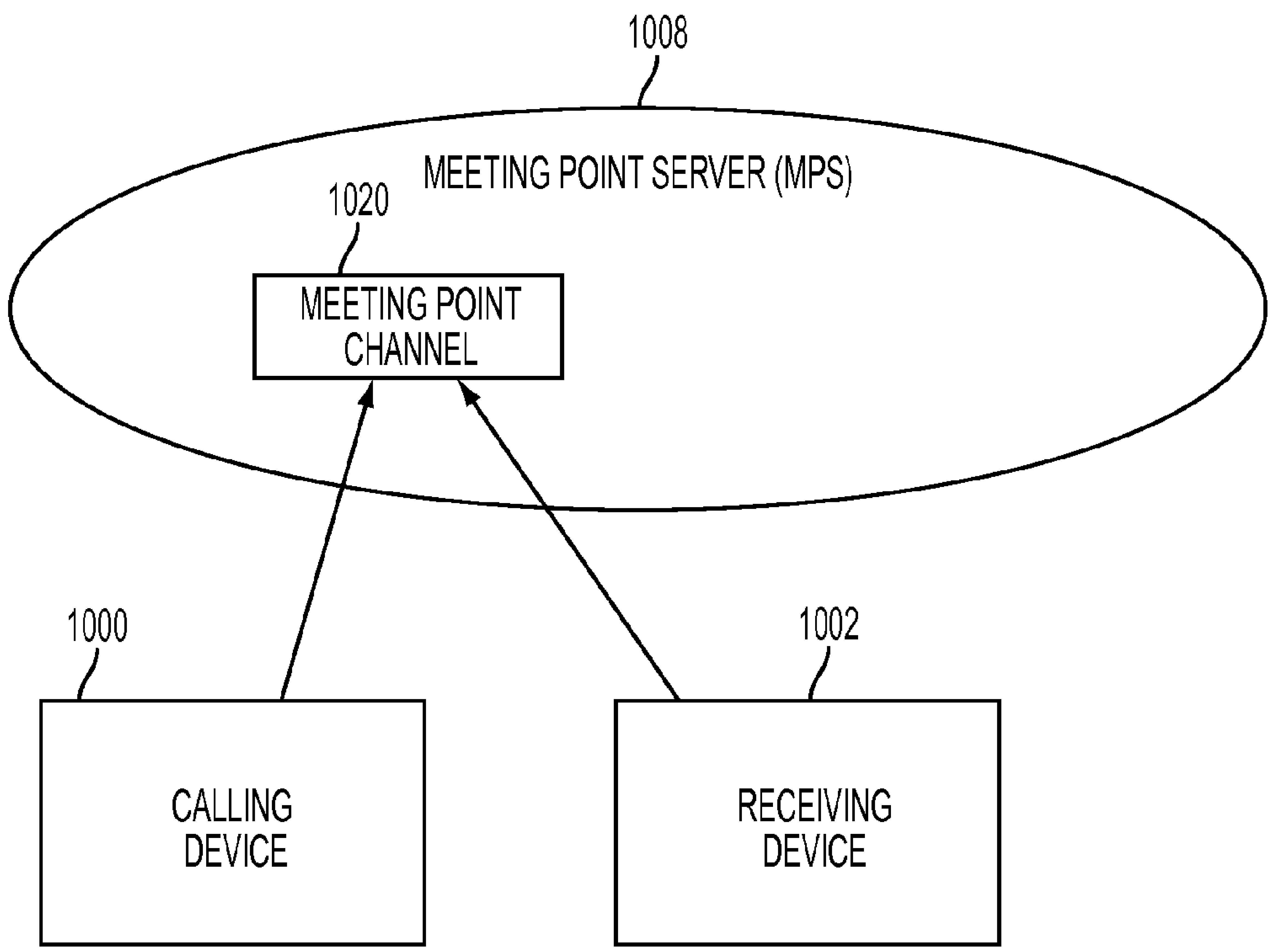

908
MEETING POINT SERVER (MPS)
MEETING POINT CHANNEL
MEETING POINT CHANNEL
MEETING POINT CHANNEL
920
MEETING POINT CHANNEL
920
900
CALLING DEVICE

FIG. 9


1008
MEETING POINT SERVER (MPS)
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MEETING POINT CHANNEL
1000
1002
CALLING DEVICE
RECEIVING DEVICE

FIG. 10

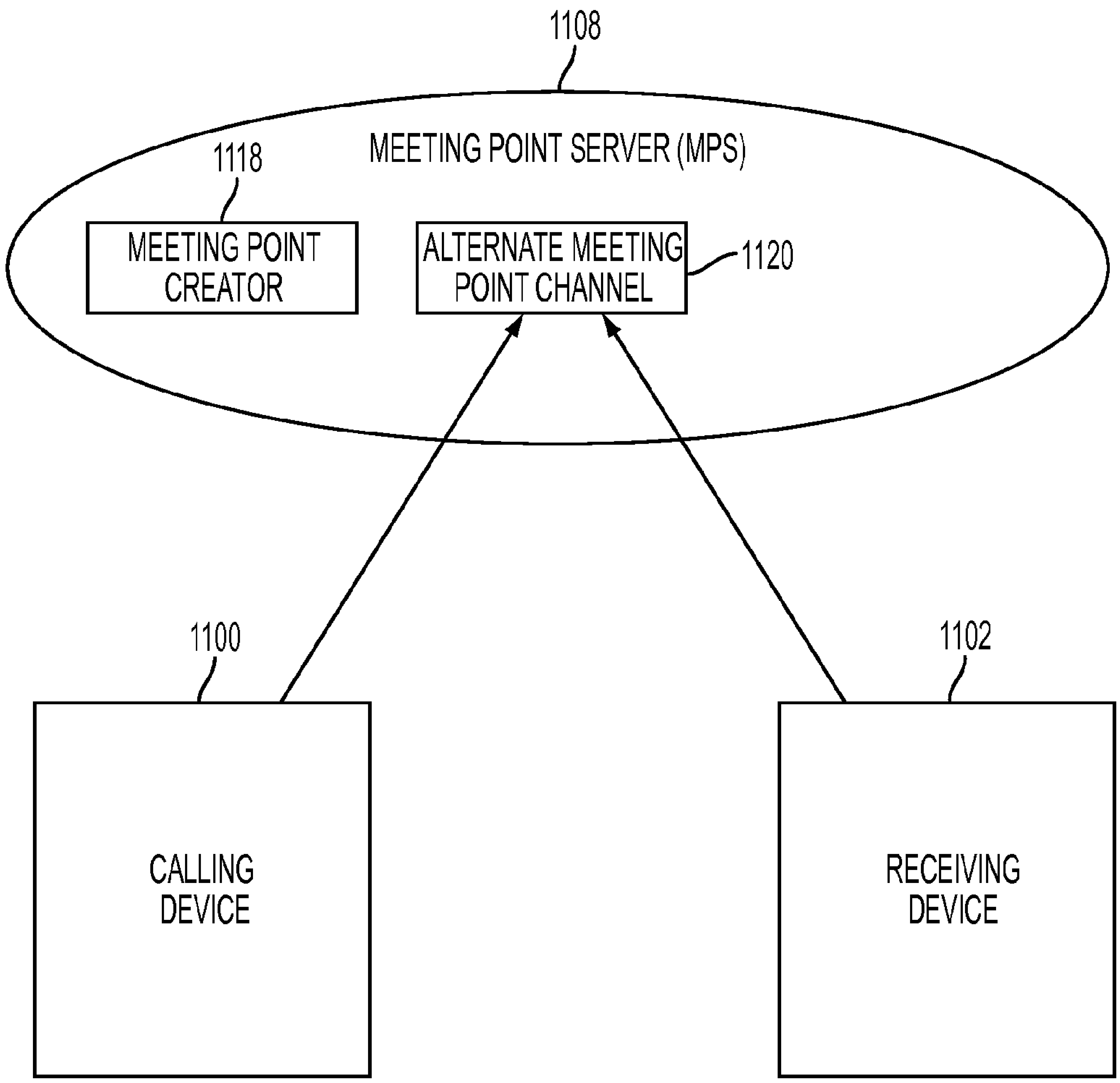

1108
MEETING POINT SERVER (MPS)
1118
MEETING POINT CREATOR
ALTERNATE MEETING POINT CHANNEL
1120
1100
1102
CALLING DEVICE
RECEIVING DEVICE

FIG. 11

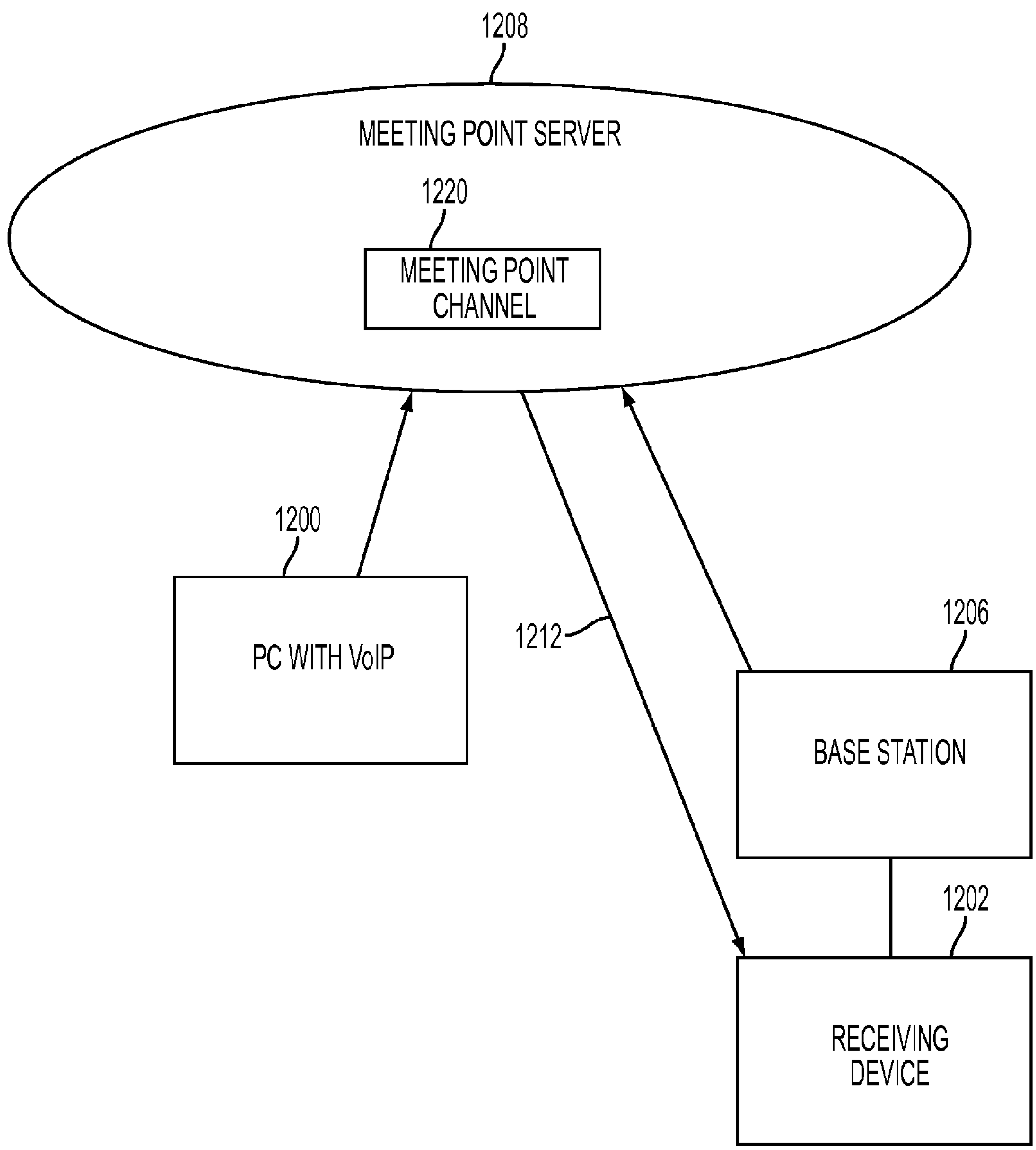

1208
MEETING POINT SERVER
1220
MEETING POINT CHANNEL
1200
PC WITH VoIP
1212
1206
BASE STATION
1202
RECEIVING DEVICE

FIG. 12

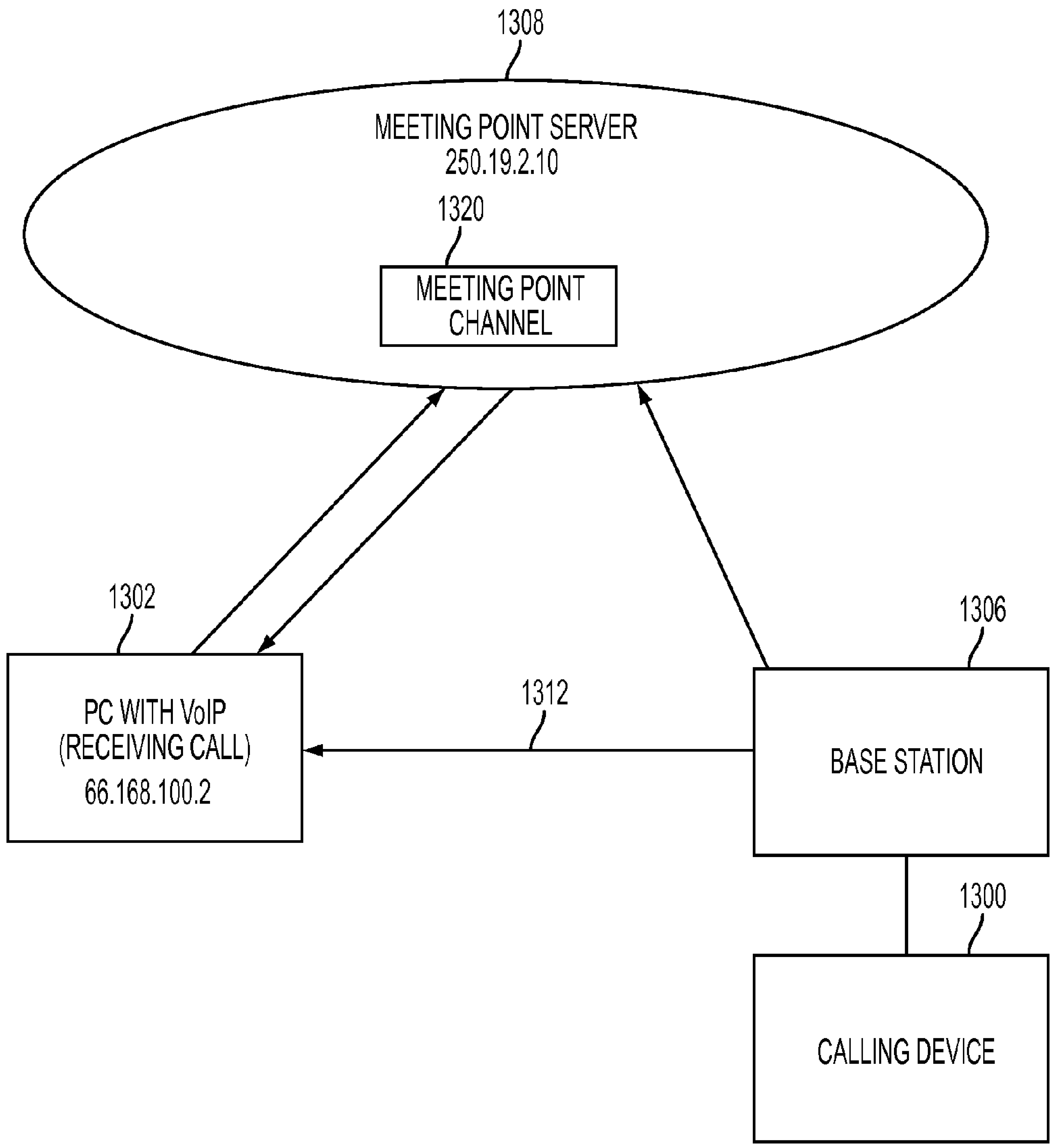

1308
MEETING POINT SERVER
250.19.2.10
1320
MEETING POINT CHANNEL
1302
PC WITH VoIP
(RECEIVING CALL)
66.168.100.2
1312
1306
BASE STATION
1300
CALLING DEVICE

FIG. 13

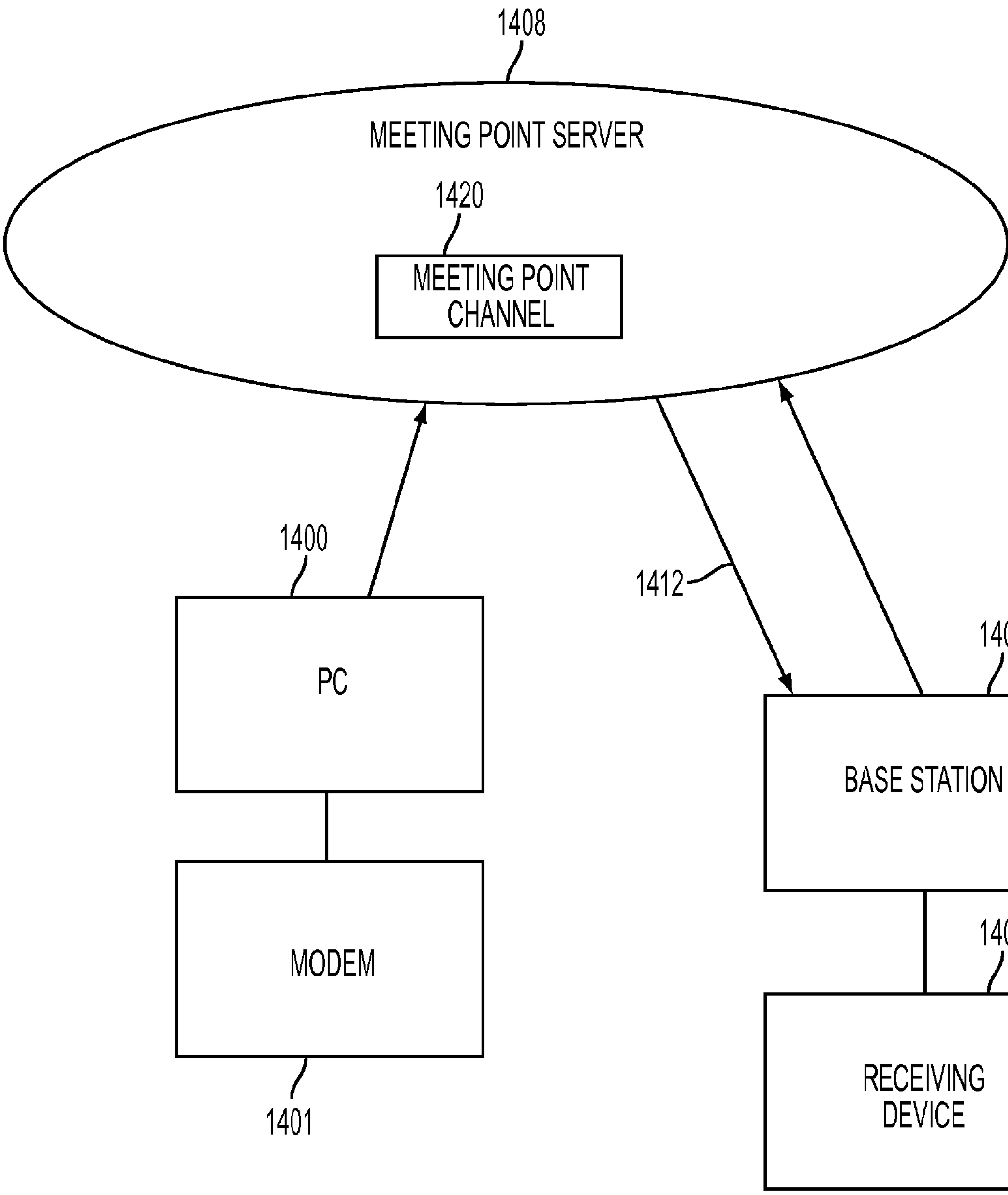

1408
MEETING POINT SERVER
1420
MEETING POINT CHANNEL
1400
PC
MODEM
1401
1412
1406
BASE STATION
1402
RECEIVING DEVICE

FIG. 14

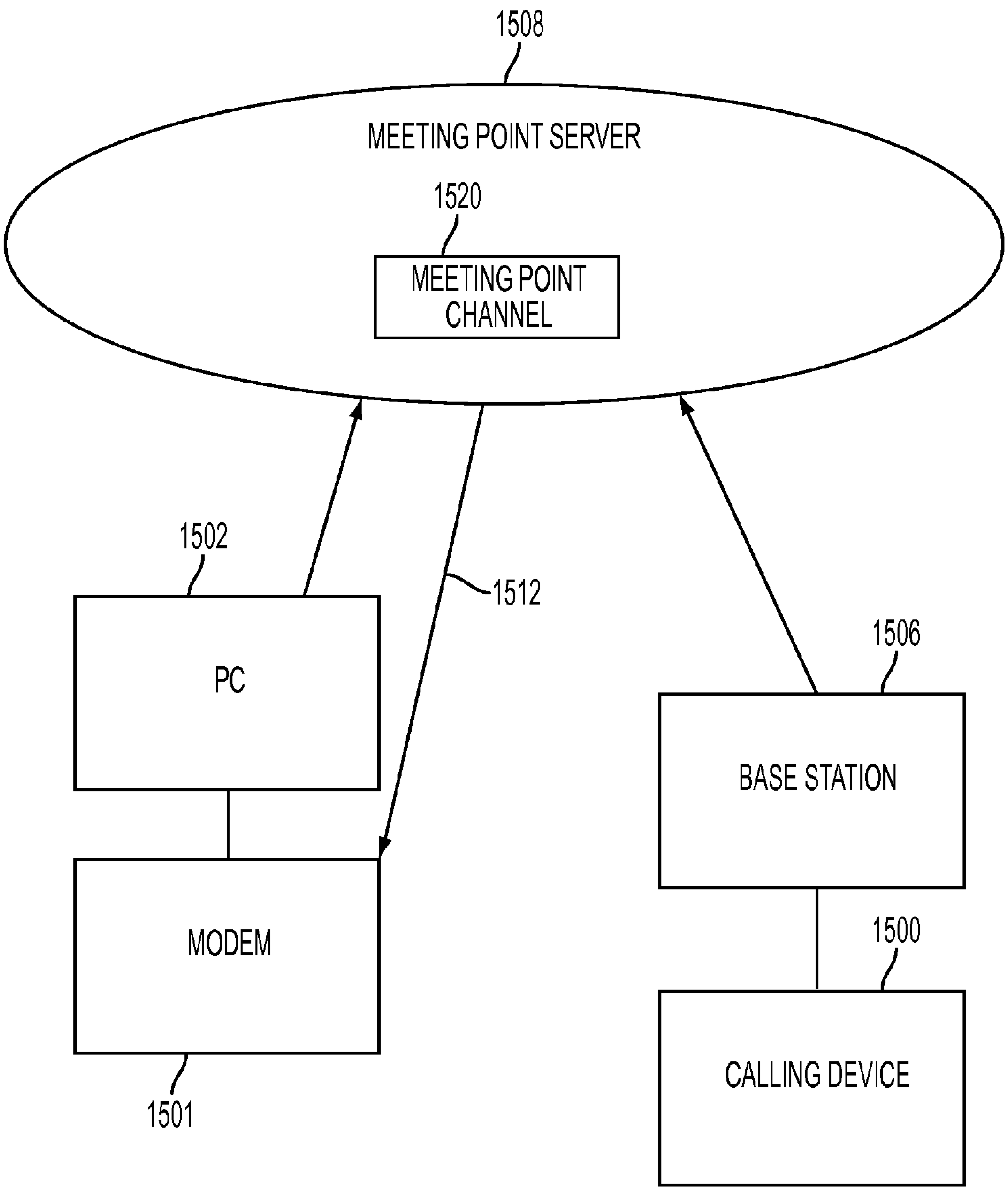

1508
MEETING POINT SERVER
1520
MEETING POINT CHANNEL
1502
PC
1512
1506
BASE STATION
MODEM
1500
1501
CALLING DEVICE

FIG. 15

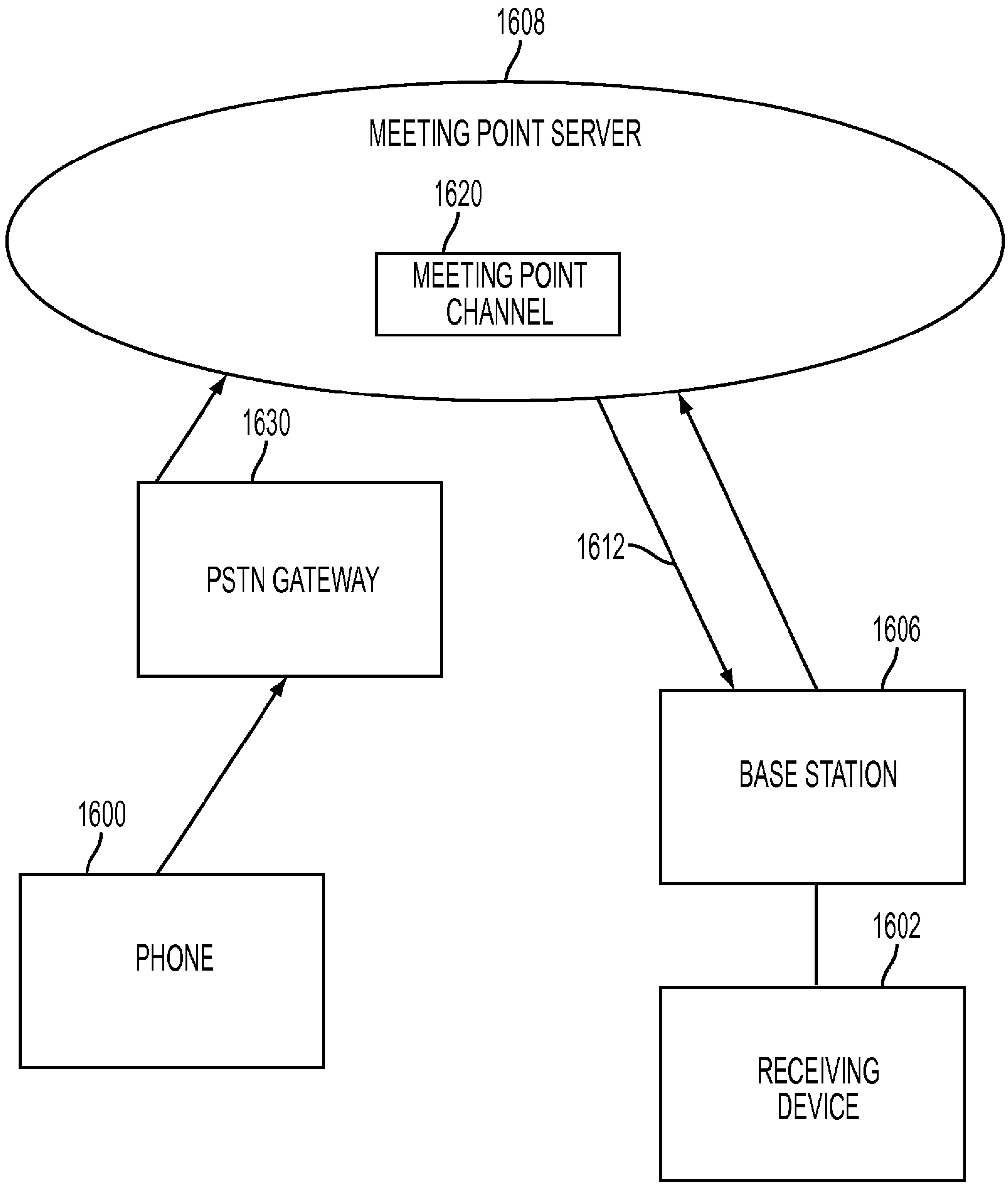
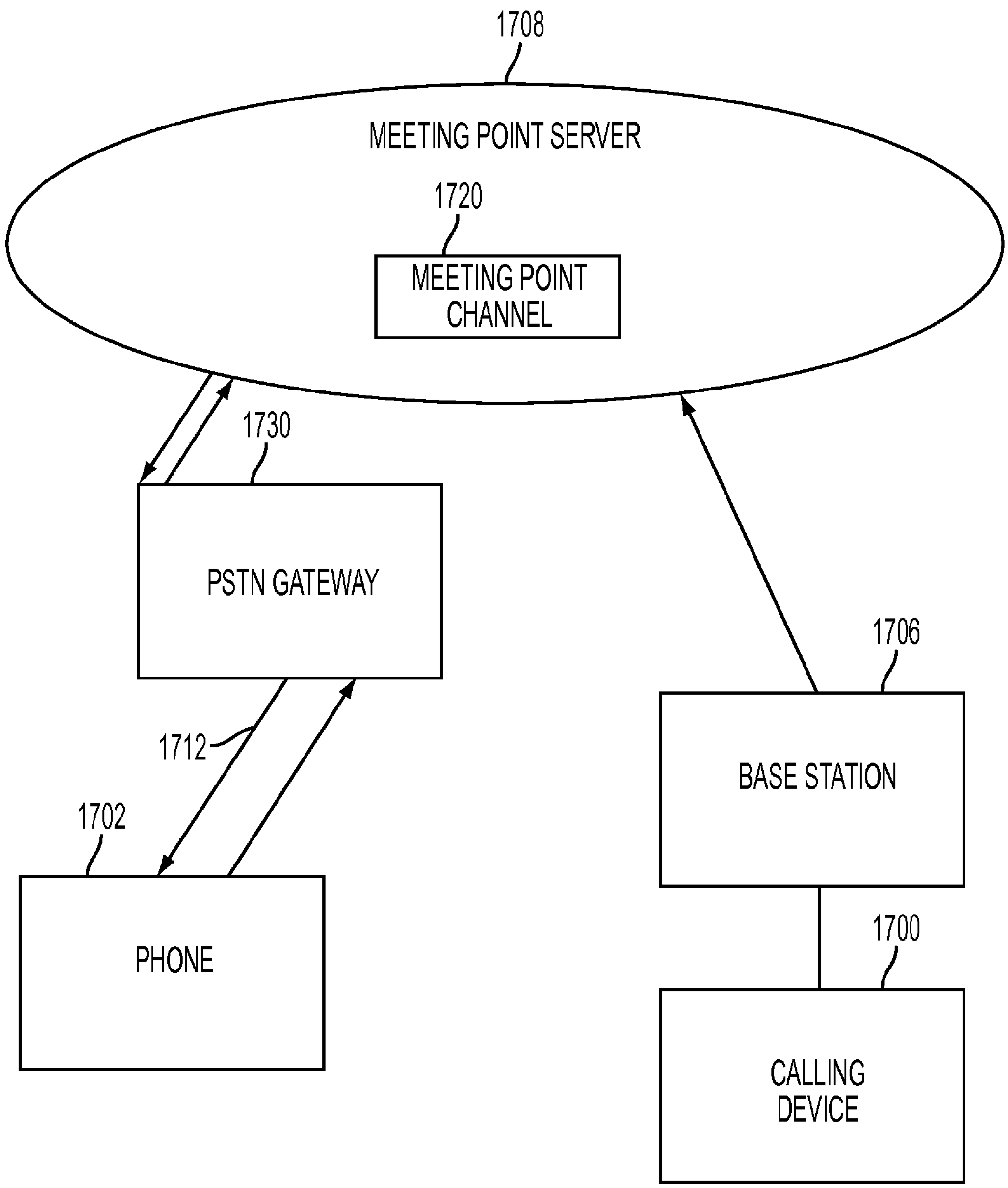

1608
MEETING POINT SERVER
1620
MEETING POINT CHANNEL
1630
PSTN GATEWAY
1612
1606
BASE STATION
1600
PHONE
1602
RECEIVING DEVICE

FIG. 16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MEETING POINT SERVER
1720
MEETING POINT CHANNEL
1730
PSTN GATEWAY
1712
1702
PHONE
1706
BASE STATION
1700
CALLING DEVICE

FIG. 17

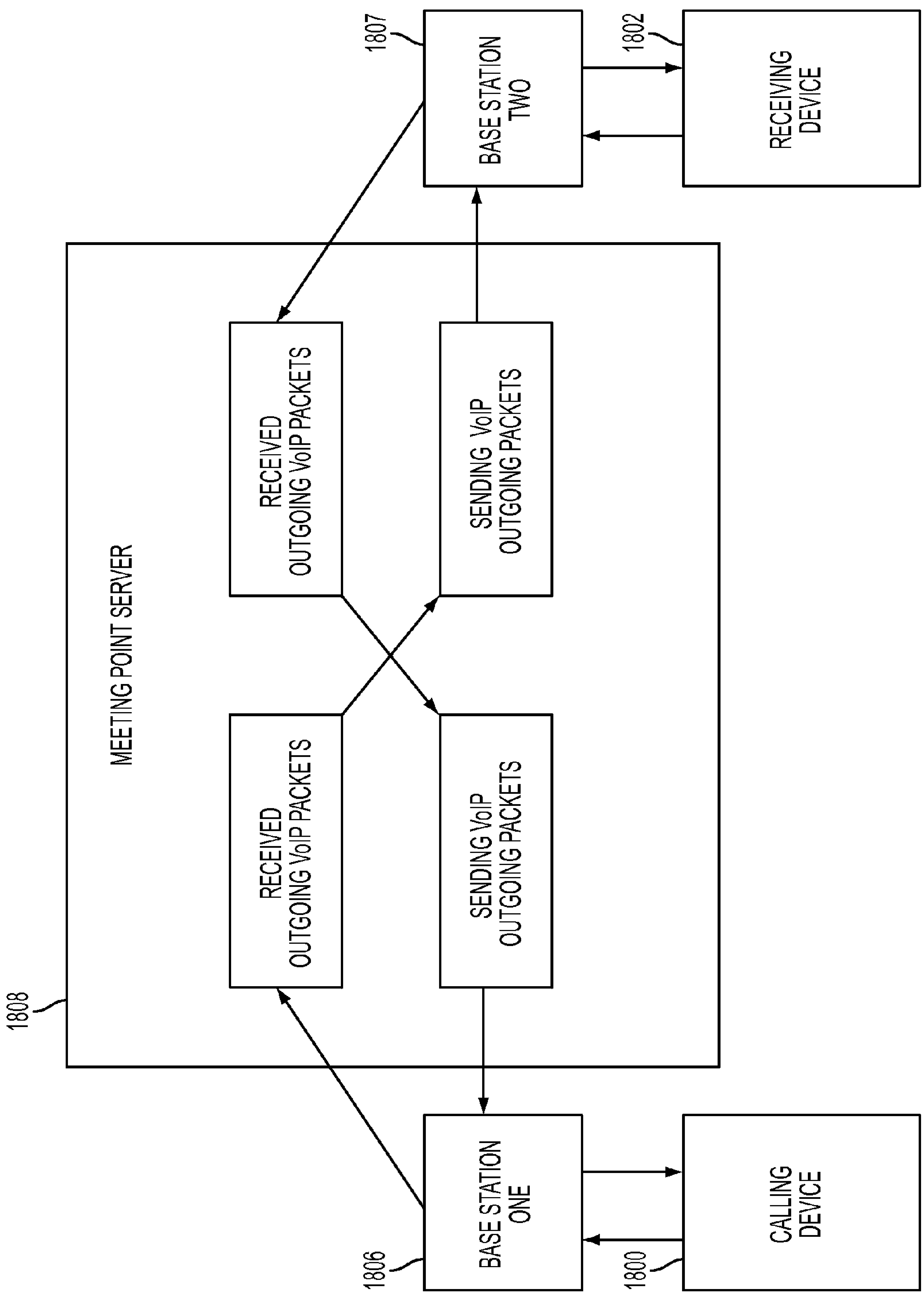
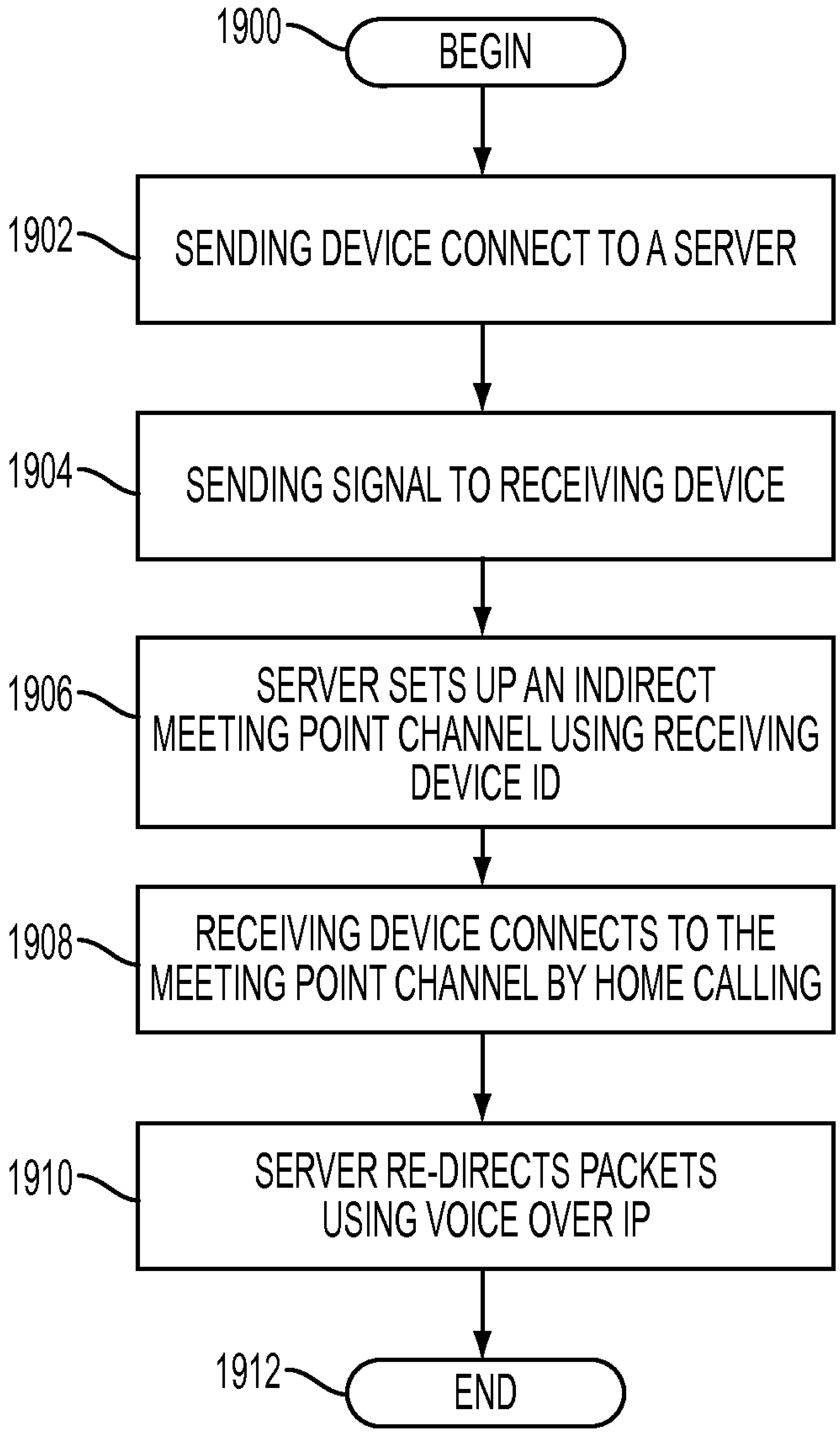

1807
BASE STATION TWO
1802
RECEIVING DEVICE
1808
MEETING POINT SERVER
RECEIVED OUTGOING VoIP PACKETS
SENDING VoIP OUTGOING PACKETS
RECEIVED OUTGOING VoIP PACKETS
SENDING VoIP OUTGOING PACKETS
1806
BASE STATION ONE
1800
CALLING DEVICE

FIG. 18



1900
BEGIN
1902
SENDING DEVICE CONNECT TO A SERVER
1904
SENDING SIGNAL TO RECEIVING DEVICE
1906
SERVER SETS UP AN INDIRECT MEETING POINT CHANNEL USING RECEIVING DEVICE ID
1908
RECEIVING DEVICE CONNECTS TO THE MEETING POINT CHANNEL BY HOME CALLING
1910
SERVER RE-DIRECTS PACKETS USING VOICE OVER IP
1912
END


FIG. 19

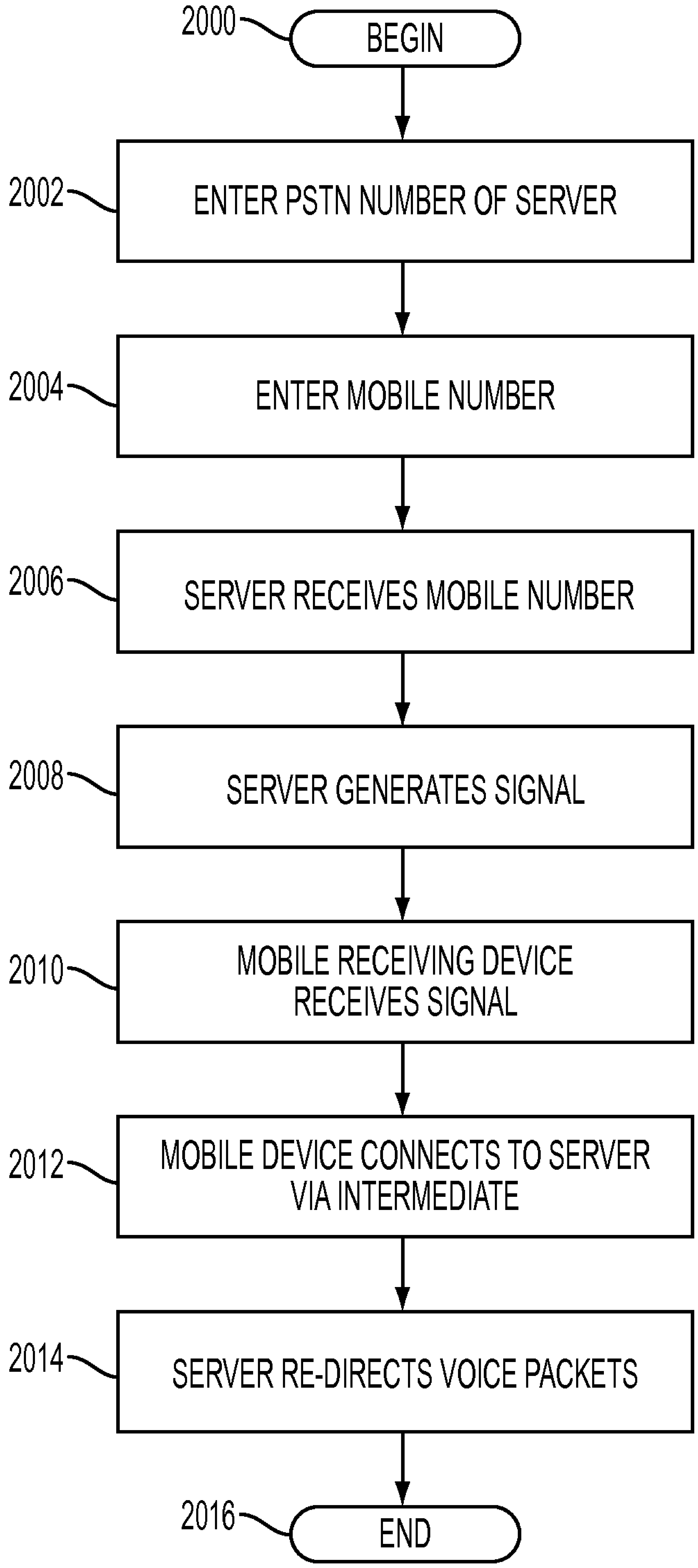

2000
BEGIN
2002
ENTER PSTN NUMBER OF SERVER
2004
ENTER MOBILE NUMBER
2006
SERVER RECEIVES MOBILE NUMBER
2008
SERVER GENERATES SIGNAL
2010
MOBILE RECEIVING DEVICE RECEIVES SIGNAL
2012
MOBILE DEVICE CONNECTS TO SERVER VIA INTERMEDIATE
2014
SERVER RE-DIRECTS VOICE PACKETS
2016
END

FIG. 20

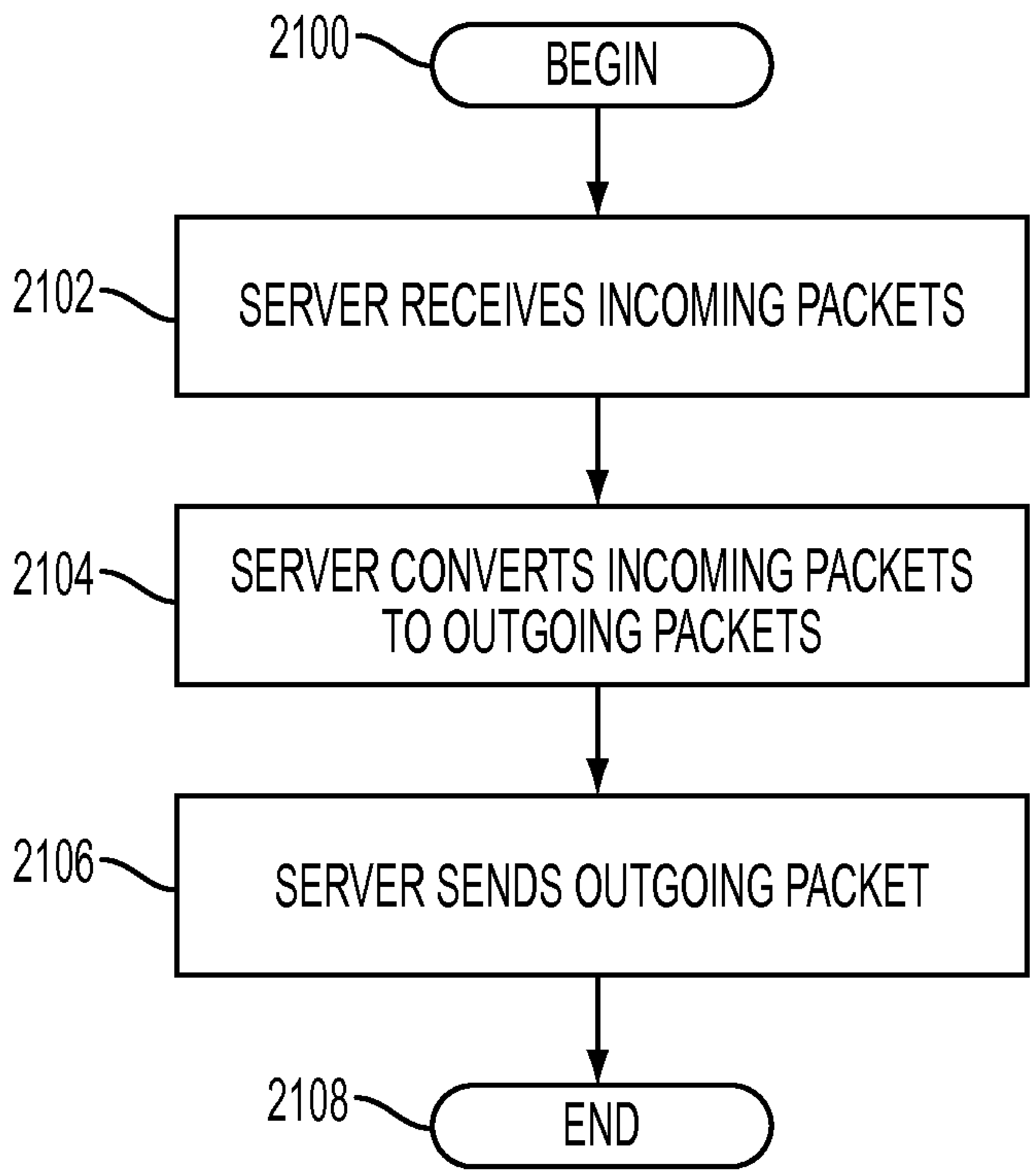

2100
BEGIN
2102
SERVER RECEIVES INCOMING PACKETS
2104
SERVER CONVERTS INCOMING PACKETS TO OUTGOING PACKETS
2106
SERVER SENDS OUTGOING PACKET
2108
END

FIG. 21

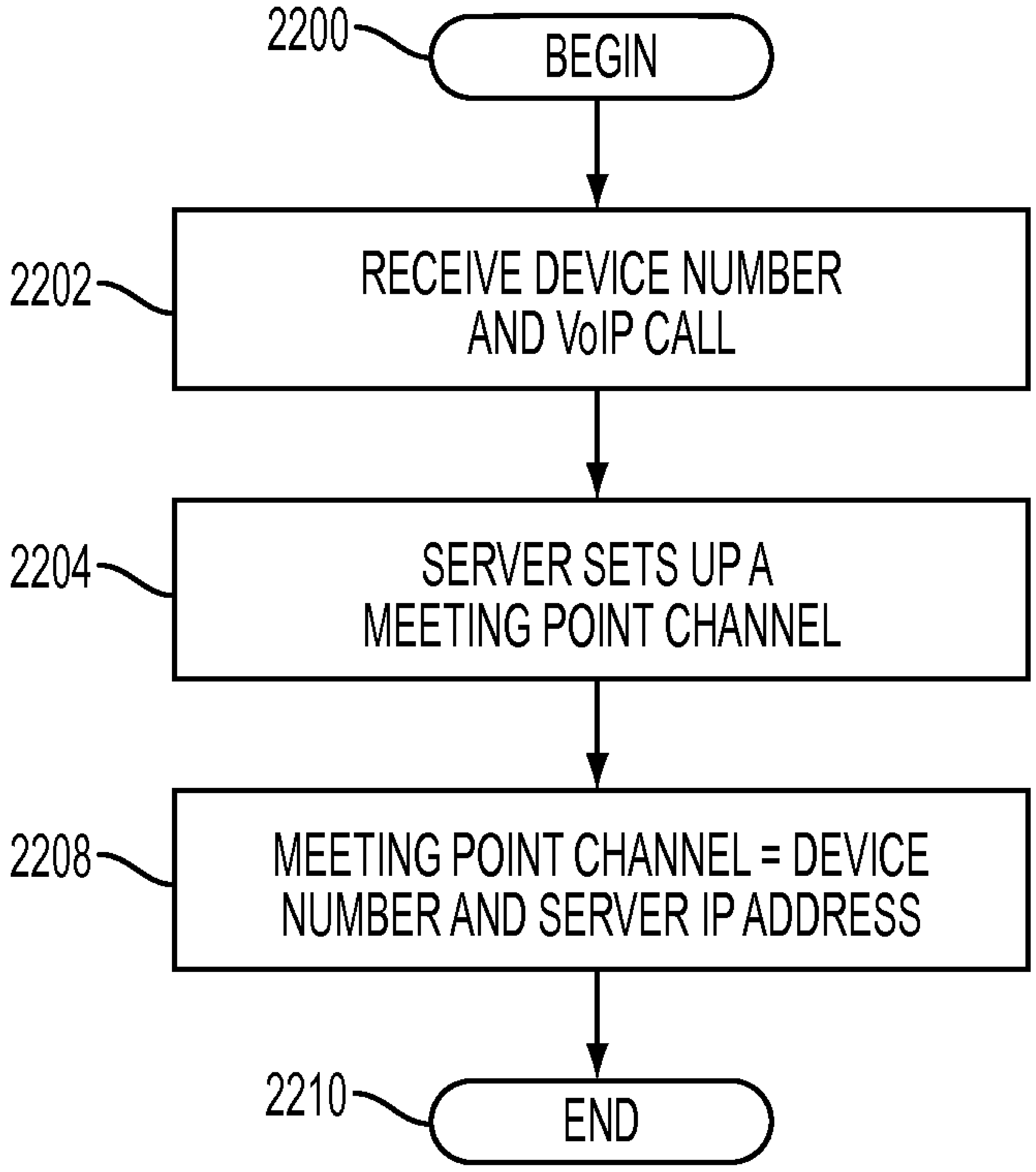

2200
BEGIN
2202
RECEIVE DEVICE NUMBER AND VoIP CALL
2204
SERVER SETS UP A MEETING POINT CHANNEL
2208
MEETING POINT CHANNEL = DEVICE NUMBER AND SERVER IP ADDRESS
2210
END

FIG. 22

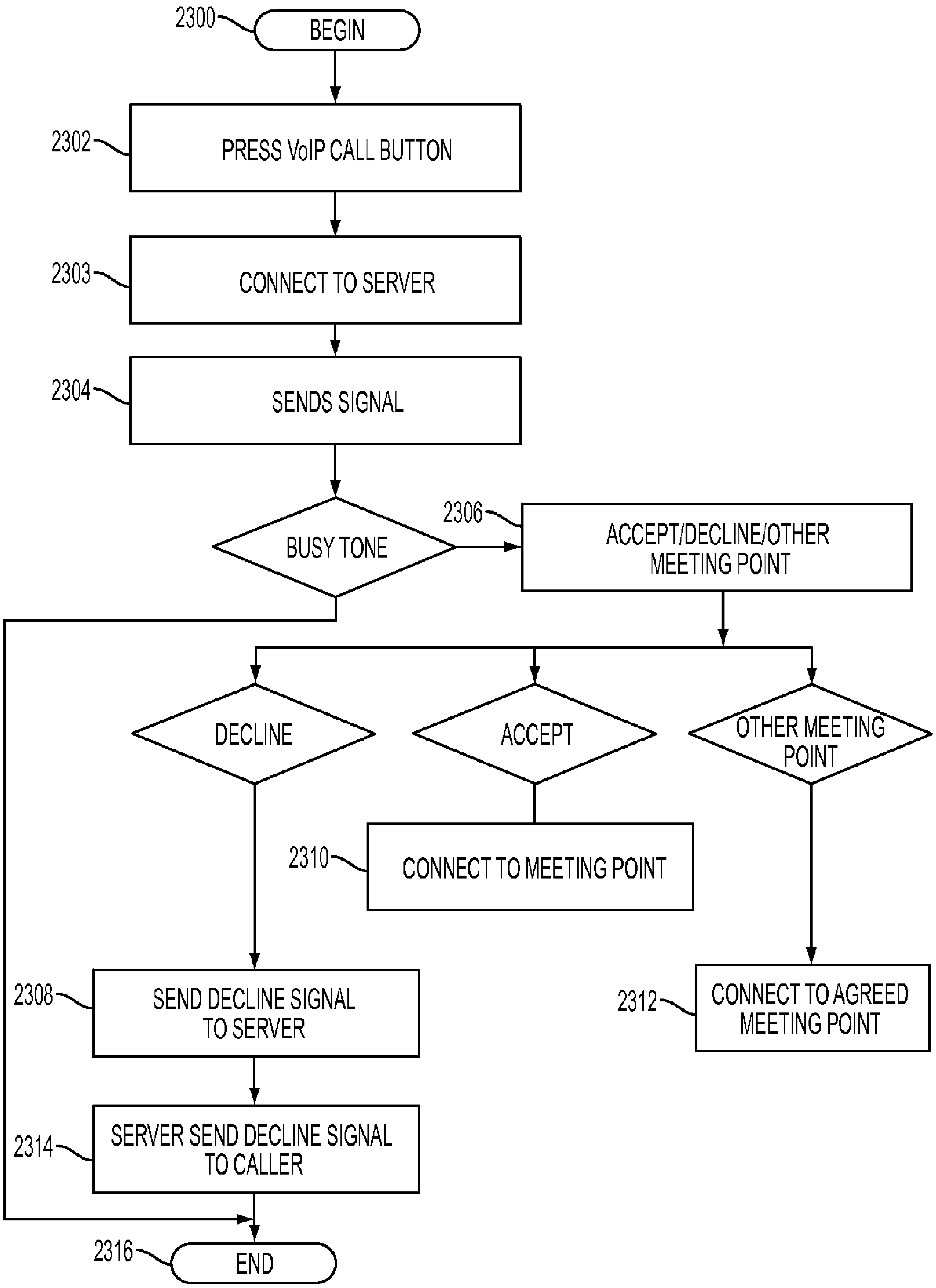

2300
BEGIN
2302
PRESS VoIP CALL BUTTON
2303
CONNECT TO SERVER
2304
SENDS SIGNAL
BUSY TONE
2306
ACCEPT/DECLINE/OTHER MEETING POINT
DECLINE
ACCEPT
OTHER MEETING POINT
2310
CONNECT TO MEETING POINT
2308
SEND DECLINE SIGNAL TO SERVER
2312
CONNECT TO AGREED MEETING POINT
2314
SERVER SEND DECLINE SIGNAL TO CALLER
2316
END

FIG. 23

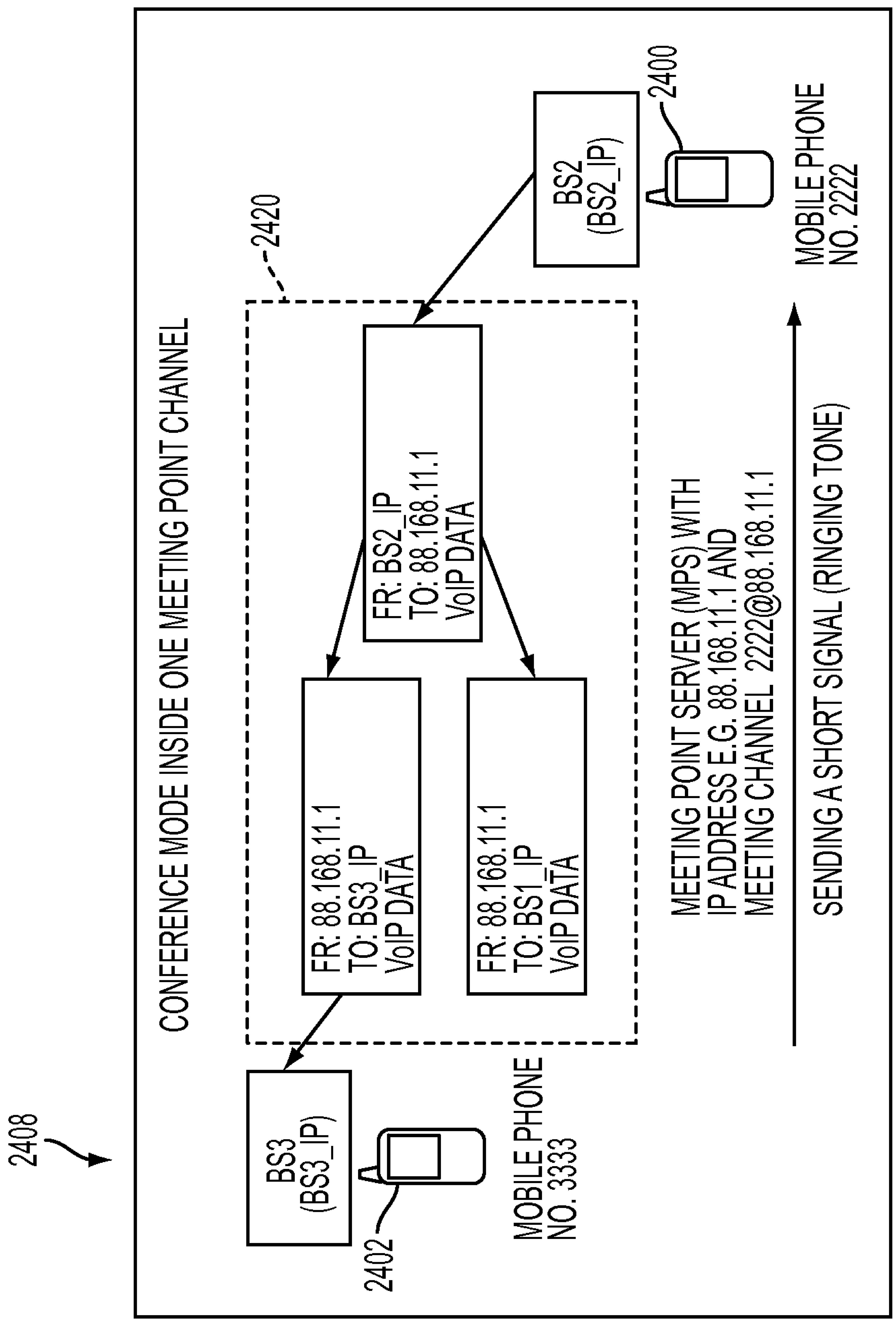

2408
CONFERENCE MODE INSIDE ONE MEETING POINT CHANNEL
2420
BS2
(BS2_IP)
2400
MOBILE PHONE
NO. 2222
FR: BS2_IP
TO: 88.168.11.1
VoIP DATA
FR: 88.168.11.1
TO: BS3_IP
VoIP DATA
FR: 88.168.11.1
TO: BS1_IP
VoIP DATA
BS3
(BS3_IP)
2402
MOBILE PHONE
NO. 3333
MEETING POINT SERVER (MPS) WITH
IP ADDRESS E.G. 88.168.11.1 AND
MEETING CHANNEL 2222@88.168.11.1
SENDING A SHORT SIGNAL (RINGING TONE)

FIG. 24

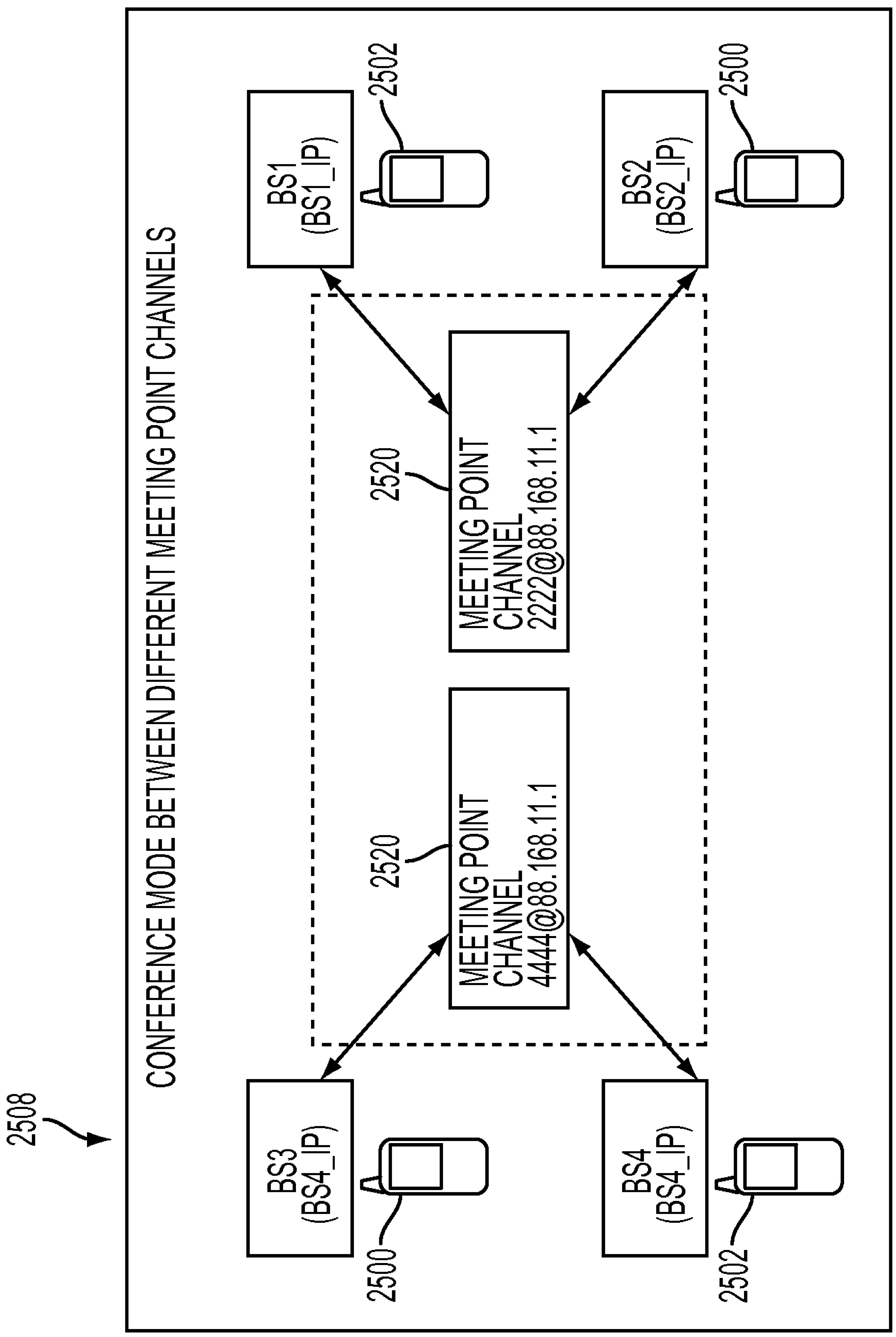

2508
CONFERENCE MODE BETWEEN DIFFERENT MEETING POINT CHANNELS
BS1 (BS1_IP)
2502
BS2 (BS2_IP)
2500
2520
MEETING POINT CHANNEL 2222@88.168.11.1
2520
MEETING POINT CHANNEL 4444@88.168.11.1
BS3 (BS4_IP)
2500
BS4 (BS4_IP)
2502

FIG. 25


vodafone UK 05:40 PM
63%
Settings
Speekezy
Account
Reg. Tel. No: +447927176753
Password: oooooo
Advanced Options
Server speekezy.homeunix.org
1 2 3 4 5 6 7 8 9 0
– / : ; ( ) £ & @ ”
#+= . , ? ! ’
ABC
space
return

FIG. 26

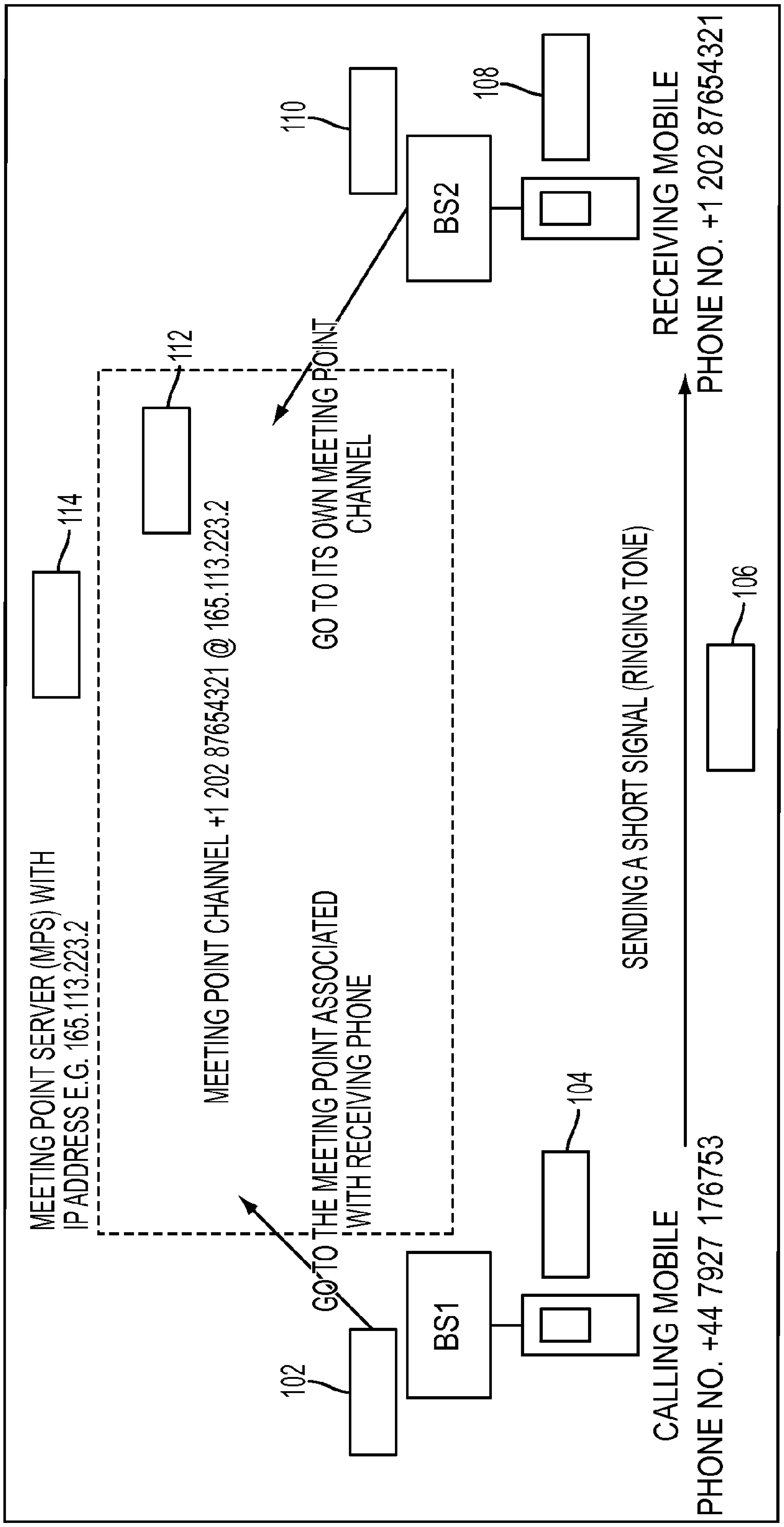

MEETING POINT SERVER (MPS) WITH
IP ADDRESS E.G. 165.113.223.2
114
112
MEETING POINT CHANNEL +1 202 87654321 @ 165.113.223.2
GO TO THE MEETING POINT ASSOCIATED
WITH RECEIVING PHONE
GO TO ITS OWN MEETING POINT
CHANNEL
102
BS1
104
110
BS2
108
SENDING A SHORT SIGNAL (RINGING TONE)
106
CALLING MOBILE
PHONE NO. +44 7927 176753
RECEIVING MOBILE
PHONE NO. +1 202 87654321

FIG. 27

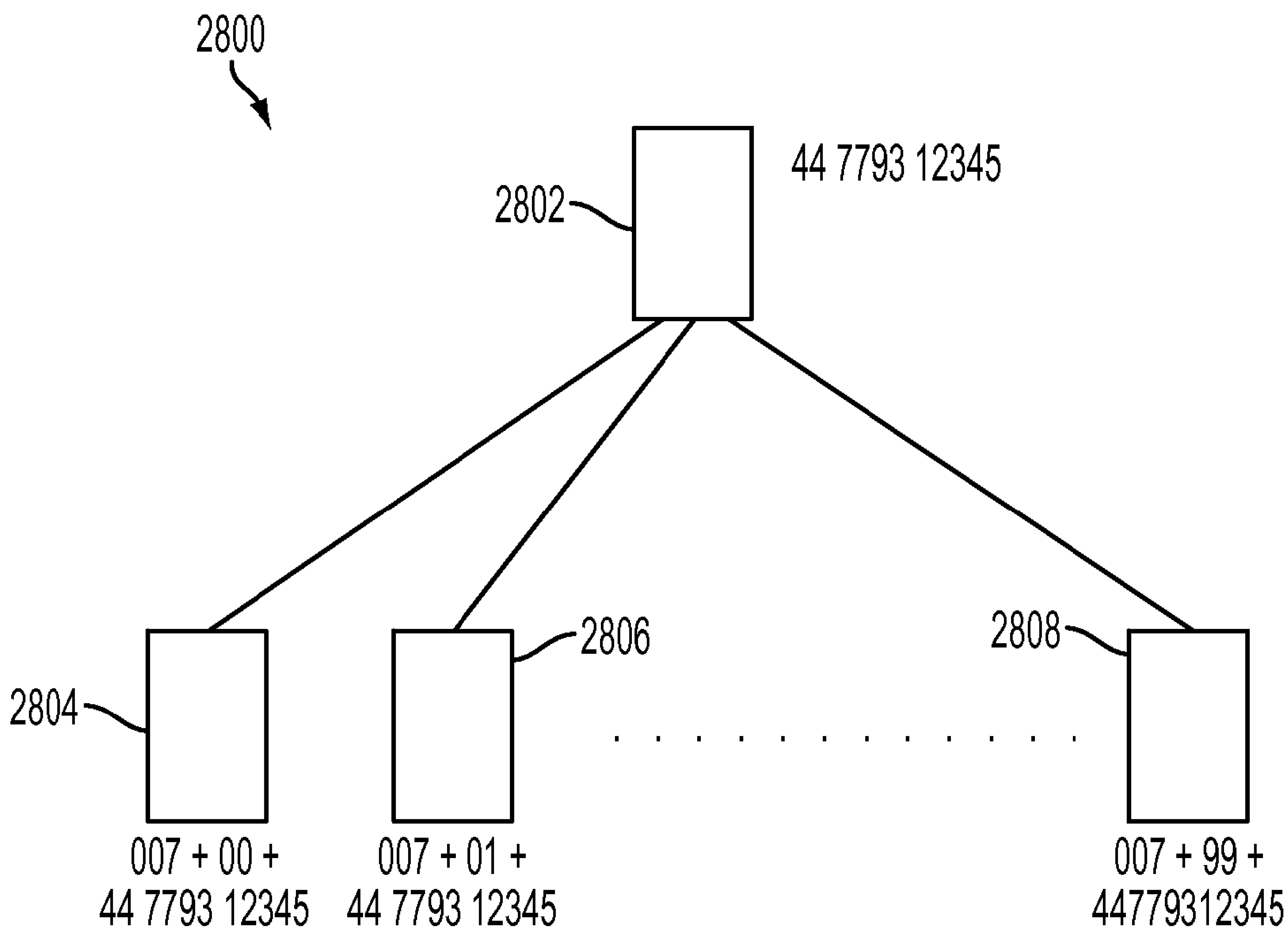

2800
2802
44 7793 12345
2804
2806
2808
007 + 00 +
44 7793 12345
007 + 01 +
44 7793 12345
007 + 99 +
44779312345

FIG. 28

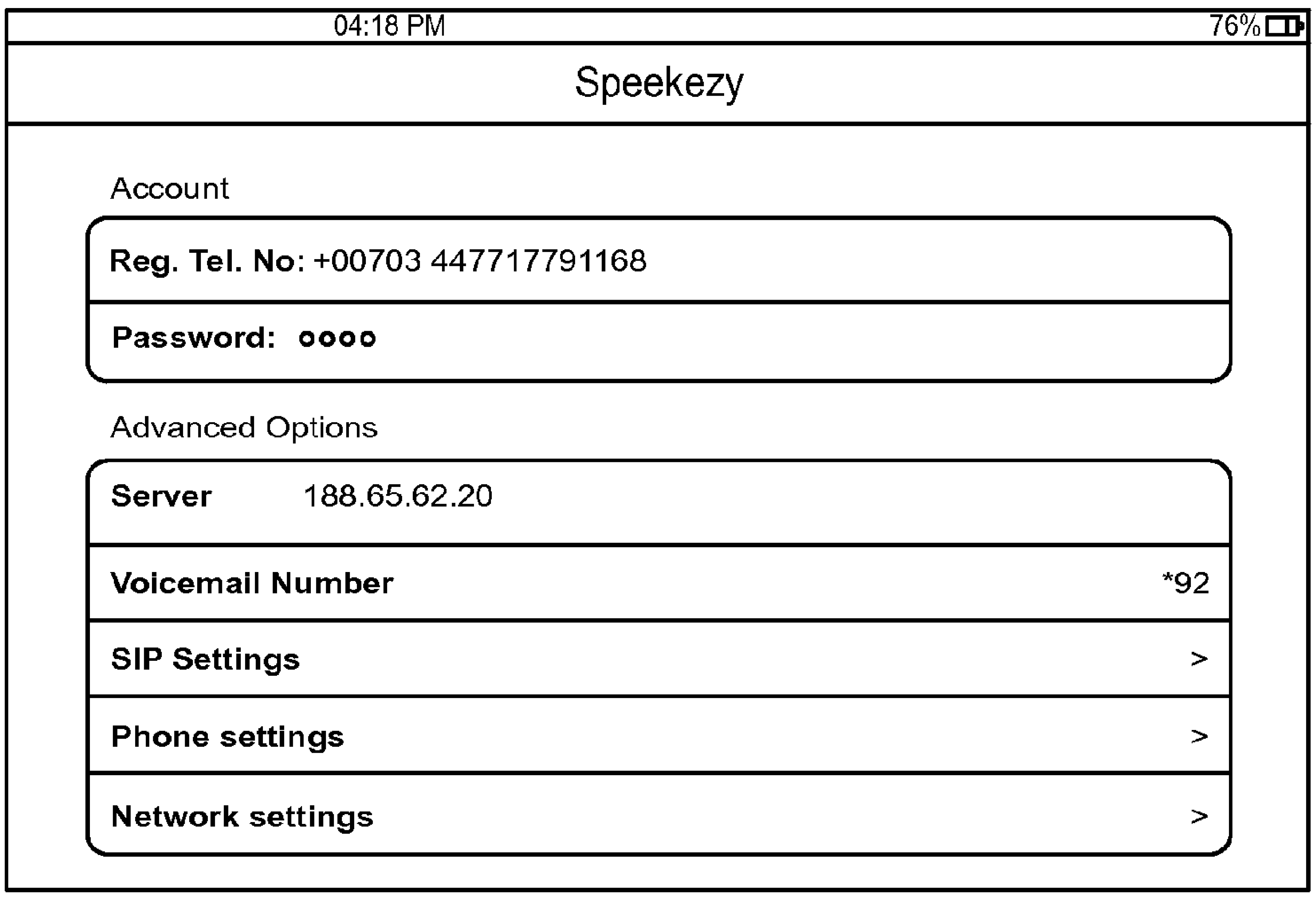

04:18 PM
76%
Speekezy
Account
Reg. Tel. No: +00703 447717791168
Password: oooo
Advanced Options
Server 188.65.62.20
Voicemail Number *92
SIP Settings >
Phone settings >
Network settings >

FIG. 29

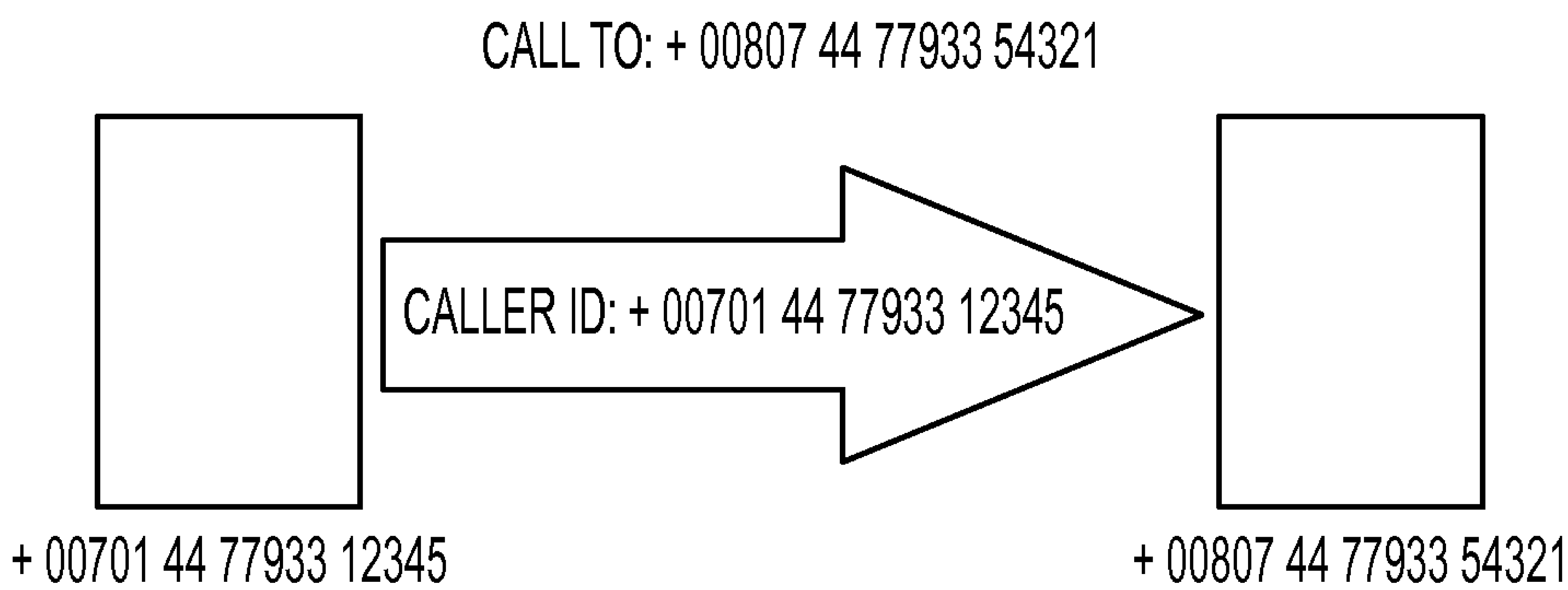

CALL TO: + 00807 44 77933 54321
CALLER ID: + 00701 44 77933 12345
+ 00701 44 77933 12345
+ 00807 44 77933 54321

FIG. 30

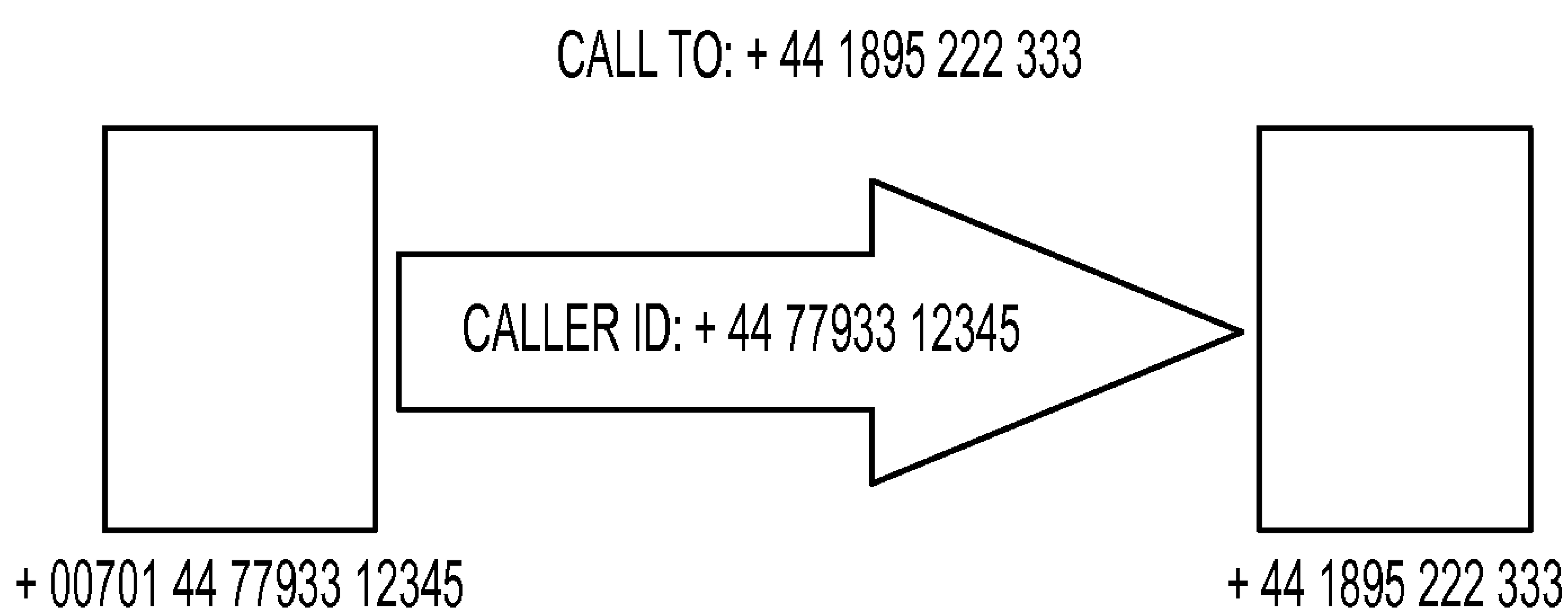

CALL TO: + 44 1895 222 333
CALLER ID: + 44 77933 12345
+ 00701 44 77933 12345
+ 44 1895 222 333

FIG. 31

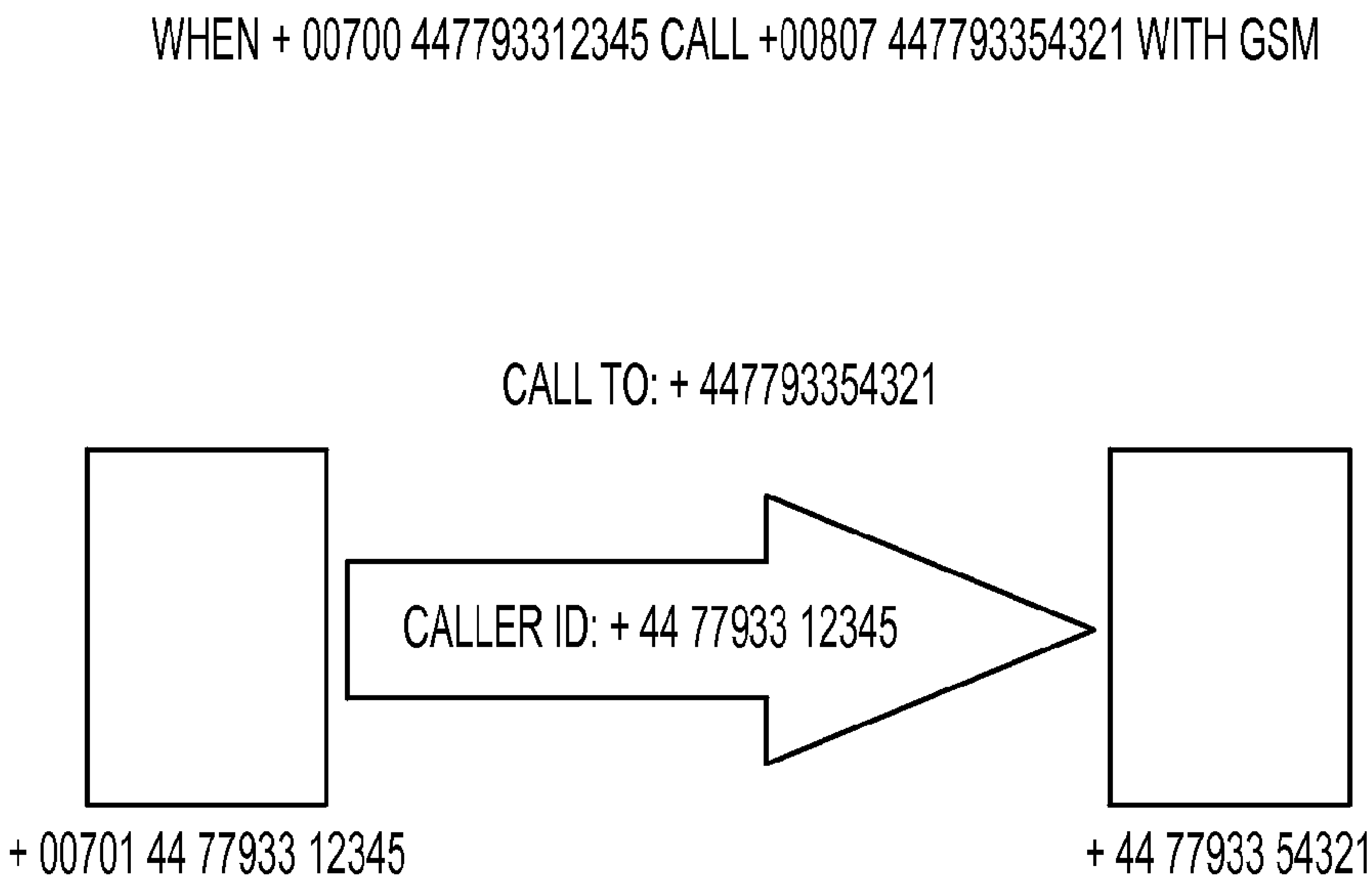

WHEN + 00700 447793312345 CALL +00807 447793354321 WITH GSM
CALL TO: + 447793354321
CALLER ID: + 44 77933 12345
+ 00701 44 77933 12345
+ 44 77933 54321

FIG. 32

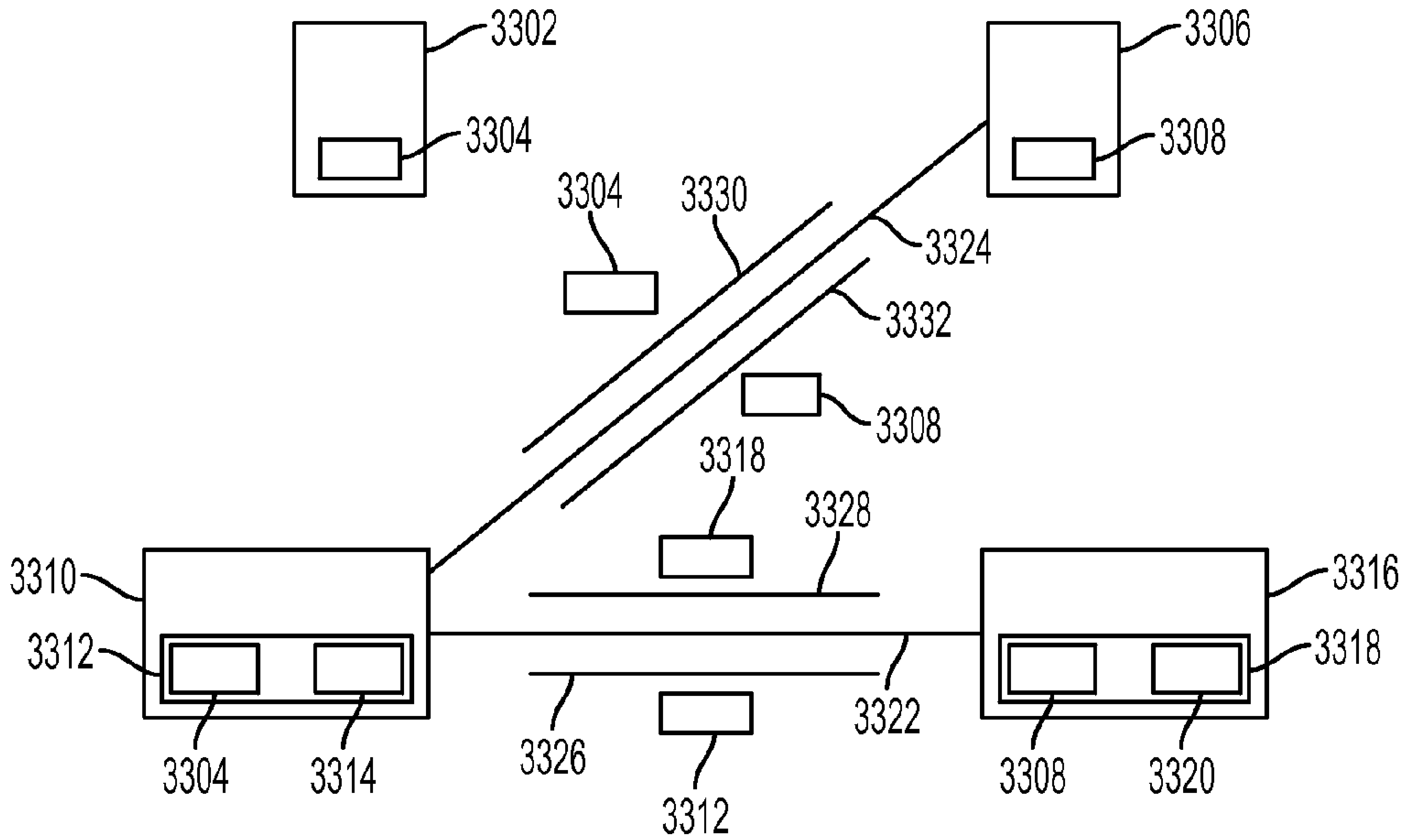

3302
3304
3306
3308
3304
3330
3324
3332
3308
3318
3328
3310
3312
3316
3318
3322
3326
3304
3314
3312
3308
3320

FIG. 33

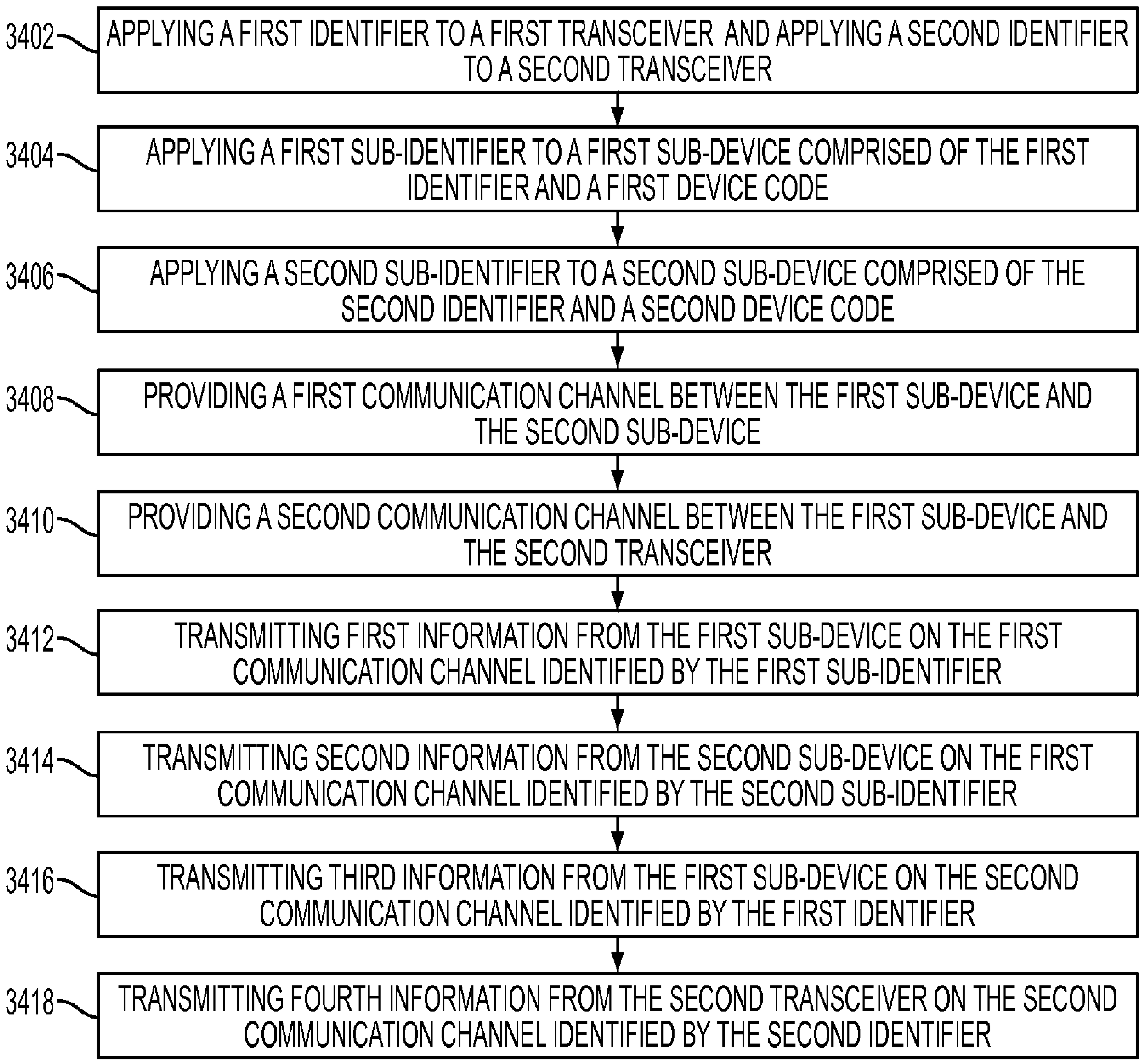

3402
APPLYING A FIRST IDENTIFIER TO A FIRST TRANSCEIVER AND APPLYING A SECOND IDENTIFIER TO A SECOND TRANSCEIVER
3404
APPLYING A FIRST SUB-IDENTIFIER TO A FIRST SUB-DEVICE COMPRISED OF THE FIRST IDENTIFIER AND A FIRST DEVICE CODE
3406
APPLYING A SECOND SUB-IDENTIFIER TO A SECOND SUB-DEVICE COMPRISED OF THE SECOND IDENTIFIER AND A SECOND DEVICE CODE
3408
PROVIDING A FIRST COMMUNICATION CHANNEL BETWEEN THE FIRST SUB-DEVICE AND THE SECOND SUB-DEVICE
3410
PROVIDING A SECOND COMMUNICATION CHANNEL BETWEEN THE FIRST SUB-DEVICE AND THE SECOND TRANSCEIVER
3412
TRANSMITTING FIRST INFORMATION FROM THE FIRST SUB-DEVICE ON THE FIRST COMMUNICATION CHANNEL IDENTIFIED BY THE FIRST SUB-IDENTIFIER
3414
TRANSMITTING SECOND INFORMATION FROM THE SECOND SUB-DEVICE ON THE FIRST COMMUNICATION CHANNEL IDENTIFIED BY THE SECOND SUB-IDENTIFIER
3416
TRANSMITTING THIRD INFORMATION FROM THE FIRST SUB-DEVICE ON THE SECOND COMMUNICATION CHANNEL IDENTIFIED BY THE FIRST IDENTIFIER
3418
TRANSMITTING FOURTH INFORMATION FROM THE SECOND TRANSCEIVER ON THE SECOND COMMUNICATION CHANNEL IDENTIFIED BY THE SECOND IDENTIFIER

FIG. 34

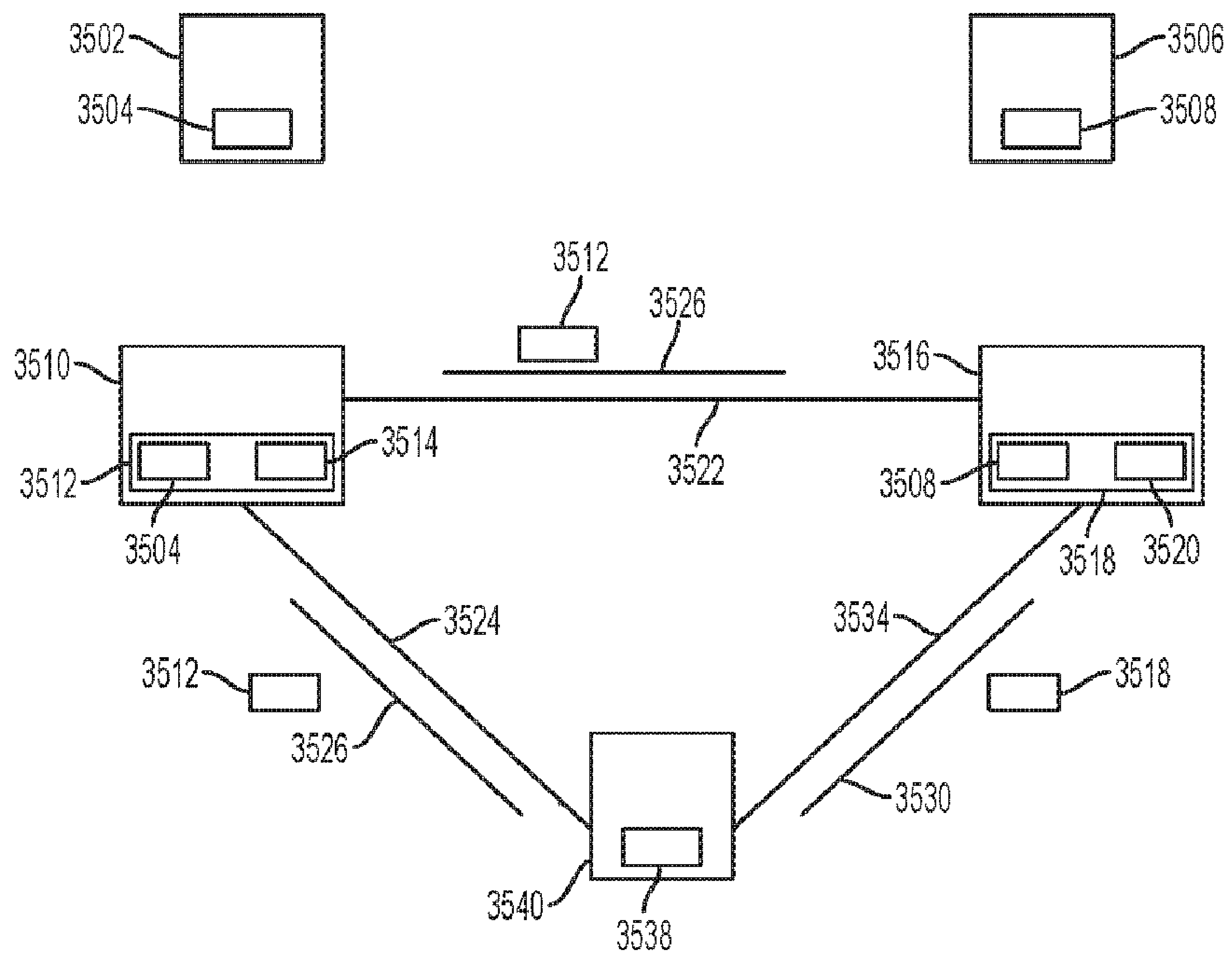

3502
3504
3506
3508
3512
3526
3510
3516
3514
3512
3522
3508
3504
3518
3520
3524
3534
3512
3518
3526
3530
3540
3538

FIG. 35

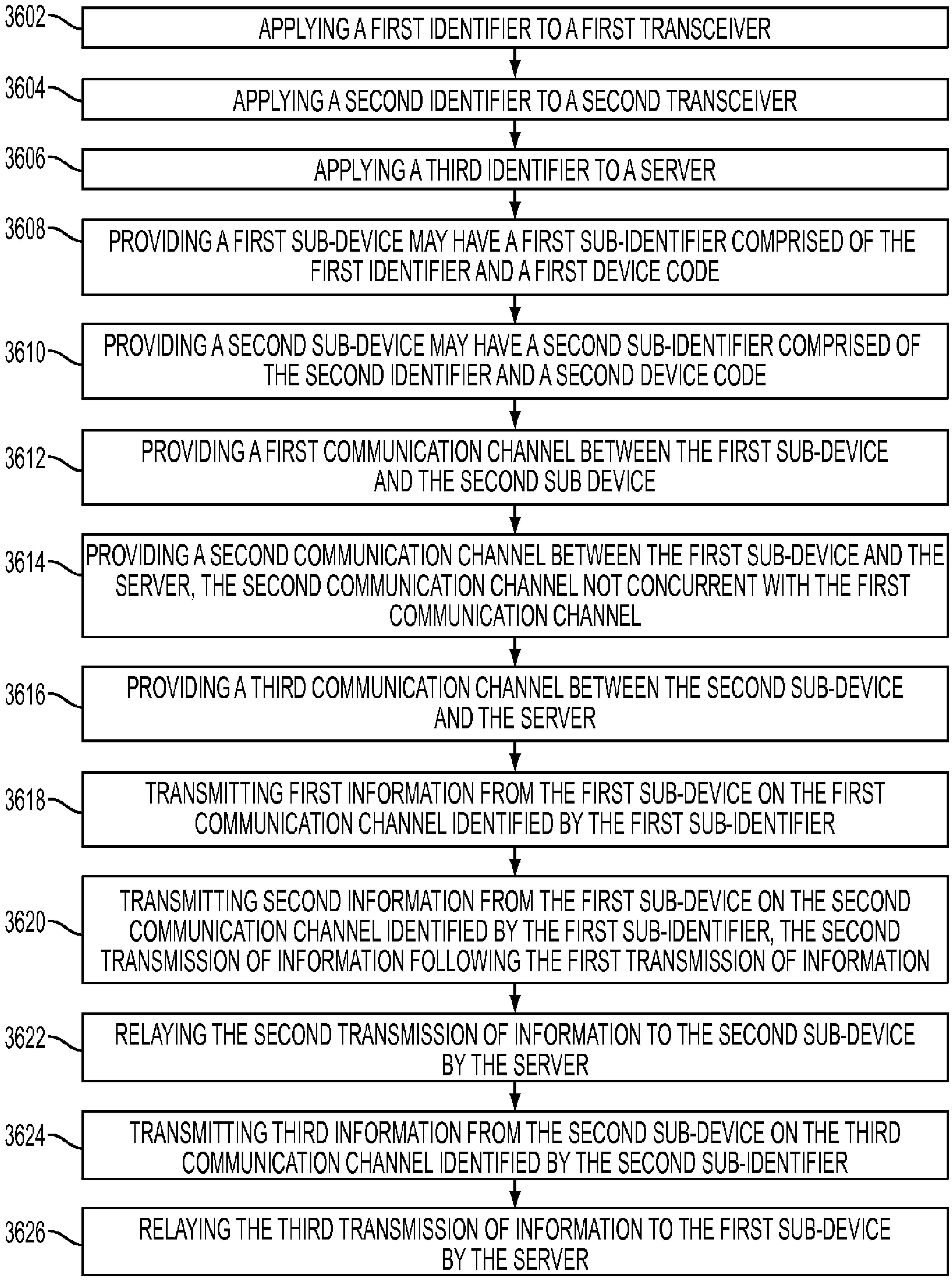

3602
APPLYING A FIRST IDENTIFIER TO A FIRST TRANSCEIVER
3604
APPLYING A SECOND IDENTIFIER TO A SECOND TRANSCEIVER
3606
APPLYING A THIRD IDENTIFIER TO A SERVER
3608
PROVIDING A FIRST SUB-DEVICE MAY HAVE A FIRST SUB-IDENTIFIER COMPRISED OF THE FIRST IDENTIFIER AND A FIRST DEVICE CODE
3610
PROVIDING A SECOND SUB-DEVICE MAY HAVE A SECOND SUB-IDENTIFIER COMPRISED OF THE SECOND IDENTIFIER AND A SECOND DEVICE CODE
3612
PROVIDING A FIRST COMMUNICATION CHANNEL BETWEEN THE FIRST SUB-DEVICE AND THE SECOND SUB DEVICE
3614
PROVIDING A SECOND COMMUNICATION CHANNEL BETWEEN THE FIRST SUB-DEVICE AND THE SERVER, THE SECOND COMMUNICATION CHANNEL NOT CONCURRENT WITH THE FIRST COMMUNICATION CHANNEL
3616
PROVIDING A THIRD COMMUNICATION CHANNEL BETWEEN THE SECOND SUB-DEVICE AND THE SERVER
3618
TRANSMITTING FIRST INFORMATION FROM THE FIRST SUB-DEVICE ON THE FIRST COMMUNICATION CHANNEL IDENTIFIED BY THE FIRST SUB-IDENTIFIER
3620
TRANSMITTING SECOND INFORMATION FROM THE FIRST SUB-DEVICE ON THE SECOND COMMUNICATION CHANNEL IDENTIFIED BY THE FIRST SUB-IDENTIFIER, THE SECOND TRANSMISSION OF INFORMATION FOLLOWING THE FIRST TRANSMISSION OF INFORMATION
3622
RELAYING THE SECOND TRANSMISSION OF INFORMATION TO THE SECOND SUB-DEVICE BY THE SERVER
3624
TRANSMITTING THIRD INFORMATION FROM THE SECOND SUB-DEVICE ON THE THIRD COMMUNICATION CHANNEL IDENTIFIED BY THE SECOND SUB-IDENTIFIER
3626
RELAYING THE THIRD TRANSMISSION OF INFORMATION TO THE FIRST SUB-DEVICE BY THE SERVER

FIG. 36

# USING INDIRECT COMMUNICATION TO PROVIDE A SOLUTION TO USE INTERNATIONAL DIALING CONVENTION AND INCORPORATING PHONE NUMBERS FOR NON-PHONE DEVICES

## CROSS-REFERENCE TO RELATED APPLICATIONS

The subject application is a continuation in part of U.S. application Ser. No. 11/808,753, filed Jun. 12, 2007, which claims priority to U.S. Provisional Application Ser. No. 60/840,005, filed Aug. 25, 2006, and this application is also based upon and claims the benefit of priority of the prior U.S. Provisional Patent Application No. 61/676,457, filed Jul. 27, 2012, and U.S. Provisional Patent Application No. 61/670,938, filed Jul. 12, 2012, the entire contents of all of which are incorporated herein by reference.

## BACKGROUND

1. Field

The invention relates generally to a device and method of making and receiving relatively low cost, high quality phone calls using a mobile phone with wireless media and Voice over Internet Protocol (VoIP).

2. Description of the Related Art

A1. The International Dialing Convention (IDC)

The International Dialing Convention (IDC) is a method to identify every individual phone (mobile phone or landline phone) in the world uniquely regardless the country and region status. The format is

+(Country Code) (Area Code) (Local Number)

The plus sign "+", is the international dialing prefix follow by the "Country Code" representing each country in the world. For example, "+1" represents "USA", and "+44" is "United Kingdom". The area code is usually used to identify the city of the country. Together with the local number, each phone can be identified uniquely such as:

+44 7927 176753—A mobile phone (12345678) in UK

+1 202 87654321—A phone (87654321) in Washington D.C., USA

## SUMMARY

In one aspect a communication system includes a first transceiver having a first identifier, a second transceiver having a second identifier, a first sub-device having a first sub-identifier comprised of the first identifier and a first device code, a second sub-device having a second sub-identifier comprised of the second identifier and a second device code, a first communication channel between the first sub-device and the second sub-device, a second communication channel between the first sub-device and the second transceiver, a first transmission of information from the first sub-device on the first communication channel identified by the first sub-identifier, a second transmission of information from the second sub-device on the first communication channel identified by the second sub-identifier, a third transmission of information from the first sub-device on the second communication channel identified by the first identifier, and a fourth transmission of information from the second transceiver on the second communication channel identified by the second identifier.

The first and/or second identifiers may be an identification number of the first transceiver, a phone identifier, a series of



digits, a GSM identifier, an International Dialing Convention identifier, a mobile phone identifier, or a land-line telephone identifier.

The first and/or second sub-identifiers may be an artificial device code, a sub-device identifier assigned to the first transceiver, or the first or the second identifiers.

The artificial device code and/or the sub-device identifier may be removed to call an outside line.

The first and/or second transceivers may be a handset, a phone, a gateway, a base station, a server, a cell tower, a transceiver, a computer, a palm top, a laptop, a tablet, or a personal digital assistant.

In one aspect a method of communication includes applying a first identifier to a first transceiver, applying a second identifier to a second transceiver, applying a first sub-identifier to a first sub-device comprised of the first identifier and a first device code, applying a second sub-identifier to a second sub-device comprised of the second identifier and a second device code, providing a first communication channel between the first sub-device and the second sub-device, providing a second communication channel between the first sub-device and the second transceiver, transmitting first information from the first sub-device on the first communication channel identified by the first sub-identifier, transmitting second information from the second sub-device on the first communication channel identified by the second sub-identifier, transmitting third information from the first sub-device on the second communication channel identified by the first identifier, and transmitting fourth information from the second transceiver on the second communication channel identified by the second identifier.

In one aspect a communication system includes a first transceiver having a first identifier, a second transceiver having a second identifier, a server having a third identifier, a first sub-device having a first sub-identifier comprised of the first identifier and a first device code, a second sub-device having a second sub-identifier comprised of the second identifier and a second device code, a first communication channel between the first sub-device and the second sub-device, a second communication channel between the first sub-device and the server, the second communication channel not concurrent with the first communication channel, a third communication channel between the second sub-device and the server, the third communication channel not concurrent with the first communication channel, a first transmission of information from the first sub-device on the first communication channel identified by the first sub-identifier, a second transmission of information from the first sub-device on the second communication channel identified by the first sub-identifier, the second transmission of information following the first transmission of information and being relayed by the server to the second sub-device, and a third transmission of information from the second sub-device on the third communication channel identified by the second sub-identifier, the third transmission of information following the first transmission of information and being relayed by the server to the first sub-device.

The server may be a computer, a base station, a handset, a Voice over Internet Protocol handset, a Voice over Internet Protocol controller, a switch box, or a dedicated black box device and peripherals.

An address of a meeting point on the server may be an identification identifier of the second transceiver and an Internet Protocol address or a Domain Name System name of the server.

If the second transceiver accepts the first transmission, the second transceiver connects to the meeting point.

If the second transceiver declines the first transmission, the second transceiver sends a decline message to the server and the server relays the decline message to the first transceiver.

If the second transceiver suggests an alternative meeting point, the second transceiver connects to the alternative meeting point.

The second and third communication channels may be comprised of packets formatted with a format selected from the group consisting of Voice over Internet Protocol, Internet Protocol, and User Datagram Protocol.

The packets may be redirected at the server by changing a sending address of each packet header from an address of the meeting point to an address of the second transceiver.

In one aspect a method of communication includes applying a first identifier to a first transceiver, applying a second identifier to a second transceiver, applying a third identifier to a server, providing a first sub-device having a first sub-identifier comprised of the first identifier and a first device code, providing a second sub-device having a second sub-identifier comprised of the second identifier and a second device code, providing a first communication channel between the first sub-device and the second sub-device, providing a second communication channel between the first sub-device and the server, the second communication channel not concurrent with the first communication channel, providing a third communication channel between the second sub-device and the server, the third communication channel not concurrent with the first communication channel, transmitting first information from the first sub-device on the first communication channel identified by the first sub-identifier, transmitting second information from the first sub-device on the second communication channel identified by the first sub-identifier, the second transmission of information following the first transmission of information, relaying the second transmission of information to the second sub-device by the server, transmitting third information from the second sub-device on the third communication channel identified by the second sub-identifier, the third transmission of information following the first transmission of information, and relaying the third transmission of information to the first sub-device by the server.

The above-described embodiments of the present invention are intended as examples, and all embodiments of the present invention are not limited to including the features described above.

The above and other features and advantages of the present invention, as well as the structure and operation of various embodiments of the present invention, are described in detail below with reference to the accompanying drawings.

Additional aspects and/or advantages of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated herein and form part of the specification, illustrate various embodiments of the present invention and, together with the description, further serve to explain the principles of the invention and to enable a person skilled in the pertinent art to make and use the invention. In the drawings, like reference numbers indicate identical or functionally similar elements. These and/or other aspects and advantages of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawing of which:

FIG. **1** is a schematic of an indirect communication system according to an embodiment;

FIG. **2** is schematic of a meeting point server for use with an embodiment;

FIG. **3**A is schematic of an indirect communication system according to an embodiment;

FIG. **3**B is schematic of an indirect communication system according to an embodiment;

FIG. **4** is a schematic of a meeting point server for use with an embodiment;

FIG. **5** is a schematic of a base station for use with an embodiment;

FIG. **6** is a schematic of a transceiver for use with an embodiment;

FIG. **7** is a schematic of a meeting point server for use with an embodiment;

FIG. **8** is a schematic of a notifying signal for use with an embodiment;

FIG. **9** is a schematic of a meeting point server for use with an embodiment;

FIG. **10** is a schematic of a meeting point server for use with an embodiment;

FIG. **11** is a schematic of a meeting point server for use with an embodiment;

FIG. **12** is a schematic of a meeting point server for use with an embodiment;

FIG. **13** is a schematic of a meeting point server for use with an embodiment;

FIG. **14** is a schematic of a meeting point server for use with an embodiment;

FIG. **15** is a schematic of a meeting point server for use with an embodiment;

FIG. **16** is a schematic of a meeting point server for use with an embodiment;

FIG. **17** is a schematic of a meeting point server for use with an embodiment;

FIG. **18** is a schematic of a meeting point server for use with an embodiment;

FIG. **19** is a process chart of an indirect communication method according to an embodiment;

FIG. **20** is a process chart of address generation for use with an embodiment;

FIG. **21** is a process chart of packet redirection for use with an embodiment;

FIG. **22** is a process chart of setting up a meeting point channel for use with an embodiment;

FIG. **23** is a process chart of setting up a telephone call for use with an embodiment;

FIG. **24** is a schematic of a meeting point server for use with an embodiment; and

FIG. **25** is a schematic of a meeting point server for use with an embodiment.

FIG. **26** shows a transceiver according to an embodiment;

FIG. **27** shows an indirect communication system according to an embodiment;

FIG. **28** shows a communication system using an artificial device code according to an embodiment;

FIG. **29** shows a transceiver according to an embodiment;

FIG. **30** shows a call from one sub-device to another according to an embodiment;

FIG. **31** shows a call from a sub-device to an outside line according to an embodiment;

FIG. **32** shows a call from one sub-device to another according to an embodiment;

FIG. **33** shows a communication system according to an embodiment;

FIG. **34** shows a method of communication according to an embodiment;

FIG. **35** shows a communication system according to an embodiment; and

FIG. **36** shows a method of communication according to an embodiment.

## DEFINITIONS

The Internet: sometimes called the Transmission Control Protocol/Internet Protocol (TCP/IP) network, refers generally to a collection of interconnected networks that uses the TCP/IP protocol.

An Internet Protocol (IP) address refers generally to an address which is a unique number having four parts separated by dots, e.g., 165.113.223.2. Each part can have values from 0 to 255. For the TCP/IP network (or Internet), IP addresses can be used to uniquely identify a computer on the network. A newer version of IP addresses using six parts instead of four is called IPv6. A computer network in which each computer can be uniquely identified by its corresponding IP address is also called the IP network.

A Domain Name System (DNS) refers generally to an Internet service that translates domain names into IP addresses. the domain name system may be used on the Internet to translate a name such as www.pwt.com to an IP address, e.g. 165.113.223.2.

Broadband refers generally to a type of data transmission in which a single medium (wire or wireless) has the capacity to carry several channels at any one time. Also known as multiplexing. Computer network or communications between computers may be broadband, with speeds from, for example, 1 Mbps (mega bit per second) to 20 Mbps.

Session Initiation Protocol (SIP) is the Internet Engineering Task Force (IETF) protocol for VoIP and other text and multimedia sessions, like instant messaging, video, online games and other services.

A SIP Phone refers generally to a device, such as a phone, which is connected to Internet directly via a broadband modem or similar device for making and receiving calls without the involvement of a PC.

An IP Packet refers generally to packets used for Internet communication that are structured the same way to ensure compatibility in a global scale. An IP packet includes an IP header followed by a variable-length data field.

A PSTN Gateway refers generally to software installed on a machine with VoIP which allows the VoIP machine to make and receive calls from an ordinary phone (i.e. a PSTN phone).

A Base Station (BS) refers generally to a device, such as a gateway, WiFi router, GSM router, a computer or a server, with a connection to a transceiver, enabling communication with a mobile phone. The BS can also connect to the Internet for VoIP functionality.

The Global System for Mobile Communication (GSM) Network uses a series of radio transmitters, which may be Base Stations (BS), to connect mobile phones to the cellular network. The radio frequency of a Base Station, which is also called a cell, covers a certain range within a discrete area. Base Stations may be interconnected so that a mobile phone can move from one cell to another without dropping a call. A set of Base Stations is connected to a particular Base Station Controller (BSC). A set of Base Station Controllers is connected to a Mobile Switching Center (MSC). The Mobile Switching Center and its associated modules route incoming and outgoing calls, including the PSTN calls and calls to other networks.

Wireless Media or Frequency refers generally to the Radio Frequency used to communicate between a mobile phone and a Base Station.

GSM Wireless Media refers generally to the five radio frequency (RF) bands used by GSM mobile phones. The bands are:

GSM-900—using 890-915 MHz and from 1 to 124 RF channel number.

GSM-1800—using 1710-1785 MHz and 374 RF channels from 512 to 885 channel number.

GSM-850—using 824-849 MHz and from 128 to 251 channel number.

GSM-1900—using 1850-1910 MHz from 512 to 810 channel number.

GSM-400—using 890-915 MHz.

Both radio frequency and channel number are compatible with 1st generation (1 G) mobile phones.

Wireless Fidelity (Wi-Fi), also known as IEEE 802.11, operates within the spectrum near 2.4 GHz, except for 802.11a, which uses 5 GHz. Different countries may have different Wi-Fi settings due to the power output requirements. By using standardized channel numbers, Radio Frequency (RF) differences can be easily detected internationally. The standard coverage of Wi-Fi is short, under a few hundred meters.

Worldwide interoperability Microway Access (WiMAX), also known as IEEE 802.16, is a standard for specific wireless access using RF between 2 to 20 GHz. The transmitting and receiving range for WiMAX, often more than 20 kilometers, is greater than that of Wi-Fi.

## DESCRIPTION OF EMBODIMENTS

It would be desirable to allow mobile phones to place and receive calls using the Internet (or a Voice over Internet Protocol network), at low cost and relatively high quality. It would further be desirable if a caller were able to let a receiving device know that someone is waiting to communicate at a meeting point on the Internet, without incurring excessive airtime charges. It would further be desirable for the receiving device to be able to connect to the meeting point as well and communicate with the calling device using Voice over Internet Protocol (VoIP), without incurring further air time charges. It would further be desirable if the caller were able to let the receiving device know that someone is waiting at a the meeting point by sending a short signal to the receiving device over the existing cellular network, to minimize expenditures for air time. It would further be desirable if the receiving device did not have to answer the short notification tone, or could hang up quickly, along with the calling device, so that airtime expenditures could be minimized, and conduct the actual communication with the calling device through the meeting point. Finally, it would be desirable if the location of the receiving device did not need to be known to the caller.

The Internet is a so-called packet-switched network. Packets are structured similarly to ensure compatibility on a global scale. An IP packet has a header followed by a variable-length data field. Among the header fields will be a Source IP, which is an address of the originating device, and a Destination IP, which is an address of the destination device. Although IP is used in this description, the invention is not limited to a particular packet format, or to IP in general. The examples herein, rather, are merely exemplary, and not meant to be limiting.

Another type of network is a circuit switched network, such as the Public Switched Telephone Network (PSTN), also known as the Plain Old Telephone System (POTS). A public switched telephone network refers generally to the national and international telephone system based on copper wires and carrying analog voice data. Telephone service carried by the public switched telephone network is often called "Plain Old Telephone Service" (POTS). Plain old telephone service is the standard telephone service that most homes use. In general, plain old telephone service is restricted to about 52 Kbps (52,000 bits per second).

A third type of network is a wireless, or radio frequency (RF), network. Wireless networks could be packet switched, like the internet, or circuit switched, like the public switched telephone network, or both.

A gateway is often used to convert packet switched data to circuit switched data, and vice versa. Thus, a gateway enables a VoIP device to make and receive calls from an ordinary phone, such as a public switched telephone network phone. A gateway refers generally to a device, either hardware or software, equipped to interface with another network that uses different protocols. A gateway may contain devices such as protocol or signal translators, for example, to provide system interoperability. A gateway may establish mutually acceptable procedures between two networks.

Voice over Internet Protocol (VoIP) refers generally to protocols, such as Session Initiation Protocol (SIP) and the International Telecommunication Union (ITU) H.323, used to carry voice signals over a packet-switched network, such as the Internet. VoIP can provide telephony capability to users on the Internet. A computer with a VoIP client (or VoIP software phone) can be used to make calls to another computer over the TCP/IP network (i.e. Internet). In general, the speaker, microphone, and the sound card of the computer can be used to talk and listen with the person at the other end. The keyboard of the computer can be used to type in the IP address or the domain name system of the receiving end so that communication can be established. The entire community using VoIP client over the TCP/IP network is generally referred to as the VoIP Network.

In a Voice over Internet Protocol communication, a voice signal received from a microphone is sampled and the samples are converted into packet payloads with a sound card by, for example, extracting the frequency content of the voice signal with a discrete Fourier transform, and forming packet payloads with the frequency data. The address of the receiver to which the packets will be addressed may be entered at a keyboard. The frequency data are converted back to voice signals at the receiver with an inverse Fourier transform using another sound card, and emitted by a speaker. Thus, VoIP can provide telephony capability to users on the Internet. The speaker and microphone could be embodied in a software phone.

Formats like Voice over Internet Protocol, which utilize the Internet to transfer information, offer the ability to communicate for a flat fee, paid to an internet service provider. A flat fee is often less expensive, given the duration or frequency of the communication, than the comparable cost of communication using a cellular phone. One drawback associated with communication over the Internet, however, is that the parties to the communication need to intend to communicate, and also participate in setting up the call by, at least, making their location known. Each party, for example, accesses the Internet separately, contacts the other party, and then commences the communication.

There is, in general, no Internet analogy to the notifying function provided by a cellular telephone service provider, in which one party dials a telephone number of the other party, and the cellular phone service provider locates the other party's phone and connects the call. The Internet, in particular, has none of the infrastructure provided by a cellular phone service provider dedicated to locating the cellular phone of the called party. It would be desirable, therefore, to be able to utilize the infrastructure possessed by the cellular phone service providers to set up a communication, by locating and notifying the called party, and then switch to, for example, communication over the Internet for the actual duration of the call.

In FIG. **1**, there is shown an embodiment of an indirect communication system including a calling device **100**, which may have a transceiver **104**, and a receiving device **102**, which may also have a transceiver **104**. If a cellular network, such as a Global System for Mobile Communication (GSM) network, serves the calling device **100** and the receiving device **102**, the calling device **100** and the receiving device **102** might be connected to the network by a series of base stations **106**. The base stations **106** may be connected, in turn, to a mobile switching center (MSC), which is in turn connected to other networks.

Each base station **106** serves an area called a cell, and the calling device **100** or the receiving device **102**, upon entering the cell, communicates with the network through that base station **106**. The calling device **100** and the receiving device **102**, furthermore, may be handed off from one base station **106** to another as they move from cell to cell. The base station **106** may be a personal computer (PC) with a public switched telephone network gateway, a modem, and/or switch box with the usual public switched telephone network.

The indirect communication system may also have a meeting point server **108** for communicating with the calling device **100** and the receiving device **102**, and a connection with an communication network **114**. The meeting point server **108** may be a server with a public switched telephone network gateway, a modem, and/or a switch box. Either the calling device **100**, the receiving device **102**, or both, may be a mobile phone. The roles of the calling device **100** and the receiving device **102** may be reversed, without loss of generality.

The calling device **100** is capable of transmitting and receiving a signal **110** via the transceiver **104**. The calling device **100** is connected to the base station **106** through transceiver **104**. The calling device **100** is also capable of connecting to the meeting point server **108** via the transceiver **104** or the base station **106**. For a minimum level of service, full Internet access between the base station **106** and the calling device **100** is not necessary. In fact, audio communication between the base station **106** and the calling device **100** is sufficient, so that the central processing unit (CPU) and/or computing power of the calling device **100** can be kept to a minimum.

As shown in FIG. **1**, the calling device **100** may call the receiving device **102** by sending a signal **110** to receiving device **102**. The signal **110** may be a short (one or two tone) ringing tone. The signal **110** alerts the receiving device **102** of a prospective communication with the calling device **102**. In one embodiment, the calling device **100** notifies the receiving device **102** of an intention to communicate by sending the signal **110** to the receiving device **102** and hangs up, incurring no further airtime charges. In one embodiment, the calling device **100** hangs up by disconnecting from the base station **106**.

There are a number of devices and methods that can be used to transmit the signal **110**. The calling device **100** can send the signal **110** to the receiving device **102** over the GSM network in the traditional manner. The signal **110** can also be generated or broadcast by the transceiver **104** of the calling device **100**. In an alternative embodiment the, the base station

**106** can send the signal **110** to the receiving device **102**. In an alternative embodiment, the meeting point server **108** can send the signal **110** to the receiving device **102**.

The signal **110** could be a discrete multi-tone (DMT) signal, such as a discrete multi-tone signal having one or two tones. In one embodiment, the signal **110** includes information for the receiving device **102** identifying the location, such as the address, of the meeting point server **108**. In another embodiment, the signal **110** includes information for the meeting point server **108** identifying the phone number or the address of the calling device **100** or the receiving device **102**. In another embodiment, the signal **110** may include no other information at all.

In several embodiments, the signal **110** could be any analog or digital signal suitable for connecting the calling device **100** to the base station **106** or the meeting point server **108**, such as a spread-spectrum signal, a time-, frequency-, or code division multiplexed signal, or a combination thereof. In one embodiment, the signal **110** is a GSM signal. The signal **110** may be directed to the receiving device **102** using the phone number assigned to the receiving device **102**. In this case, the signal **110** may be the aforementioned two-tone discrete multi-tone signal, a short signal to notify the receiving device **102** of a prospective or prospective communication.

After sending the signal **110**, the calling device **100** may, in general, hang up so that no further phone or airtime charges accrue. In one embodiment, the calling device **100** hangs up by disconnecting from the base station **106**. The calling device **100** may then connect to the home meeting point channel of the receiving device **102** inside the meeting point server **108**, and await the response of the receiving device **102**. There is no need for the receiving device **102** to be connected constantly to the base station **106** or the Internet.

In one embodiment, the receiving device **102** is capable of sending and receiving a signal **112**. The signal **112** could be a discrete multi-tone signal, such as a discrete multi-tone signal having two tones. In the case of direct communication between the calling device **100** and the receiving device **102**, the signal **112** could be the signal **110**, albeit displaced in time or space. In one embodiment, the signal **112** includes information for the calling device **100** identifying the location, such as the address, of the meeting point server **108**. In another embodiment, the signal **112** includes information for the meeting point server **108** identifying the phone number or the address of the calling device **100** or the receiving device **102**.

In several embodiments, the signal **112** could be any analog or digital signal suitable for connecting base station **106** or meeting point server **108** to receiving device **102**, such as a spread-spectrum signal, a time-, frequency-, or code division multiplexed signal, or a combination thereof. The signal **112** could also be used for connecting the receiving device **102** to the meeting point server **108** via the transceiver **104** or the base station **106**. In one embodiment, the signal **112** is a GSM signal.

The receiving device **102** may not answer the call, or it may answer the call and hang up, to minimize charges for using airtime. In one embodiment, hanging up means disconnecting from the base station **106**. The calling device **100** may also hang up immediately after sending the short notification signal to receiving device **102**, also to minimize charges. The signal **110**, in particular, may alert receiving device **102** of the prospective communication, without necessarily carrying out the communication itself. The signal **110** may also impart identifying information of the meeting point server **108**.

The receiving device **102**, upon receiving the signal **110** from the calling device **100**, may connect to a meeting point channel on the meeting point server **108**. In one embodiment, the receiving device **102** connects to the meeting point server **108** through the base station **106**. In another embodiment, the receiving device **102** may connect to the meeting point channel on the meeting point server **108** directly, such as over the Internet, and commence communication with the calling device **100**. After both the calling device **100** and the receiving device **102** have connected to the meeting point server **108**, communication can commence using VoIP.

The meeting point server **108** is capable of supporting a communication connection between the calling device **100** and the receiving device **102**. The connection may include the signal **110** alerting the receiving device **102** of the prospective communication with the calling device **100**. In this case, the receiving device **102** may form a connection with the meeting point server **108** after receiving the signal **110**.

The receiving device **102**, however, may not need to answer the call represented by the short, two-tone signal. Instead, the signal **110** itself may impart sufficient information for the receiving device **102** to recognize the prospect of communication with the calling device **100** at the meeting point server **108**. In the alternative, the receiving device **102** may answer the call, but hang up immediately, thus minimizing airtime charges.

In one embodiment, hanging up may mean disconnecting from the base station **106**. Therefore, an advantage of this embodiment is that the indirect communication system allows any mobile device to communicate to another device through meeting point server **108**, such as by Voice over Internet Protocol (VoIP), while avoiding the use of airtime.

The meeting point server **108** is also capable of supporting a connection between the calling device **100** and a plurality of receiving devices **102**, such as during a conference call. In this case, the meeting point server **108** would copy each packet received from the calling device **100** and redirect the copies to the individual receiving devices **102**. Each of the receiving devices **102** would have formed a connection with the meeting point server **108** after receiving their respective signals **110**.

The receiving devices **102** may not, however, have answered the call, or else, if they did answer it, they may have hung up immediately. Thus, each of the receiving devices **102** would hear the calling device **100**, but without incurring further airtime charges. Therefore, an advantage of the embodiment is that the indirect communication system allows the calling device **100** to communicate with a plurality of receiving devices **102** through meeting point server **108**, such as by Voice over Internet Protocol (VoIP), while avoiding the use of airtime.

The meeting point server **108** may be connected to other servers using the communication network **114**. In one embodiment, the communication network **114** may be an Internet communication network. In another embodiment, the communication network **114** may be an Intranet communication network, such as a company's proprietary network.

The meeting point server **108** may have an identifier, such as an IP address on the communication network **114**. The address could be a unique number having four or six parts, separated by dots, e.g. 165.113.223.2. The address can be used to identify meeting point server **108** uniquely on the communication network **114**. The meeting point server **108** may also have a domain name, such as www.pwt.com. The domain name may be convertible into an IP address by a domain name system.

In one embodiment, such as VoIP applications, the meeting point server **108** may simply be a personal computer with an IP address such as 165.113.223.2, or a domain name system name such as a web site address (e.g. www.voip_mobile-phone.com or www.pwt.com). In one embodiment, the base station **106** connecting the calling device **100** and/or the receiving device **102** can also be used as the meeting point server **108**. Many meeting points (locations or channels) can be set up inside the meeting point server **108** for the calling device **100** and the receiving device **102** to meet and talk.

In one embodiment, the calling device **100** may have a phone number 1111. The calling device **100** places a call to the receiving device **102**, which may have a phone number 2222. The calling device **100** calls the receiving device **102** by sending the signal **110** in the form of a short ringing tone, possibly including the phone number 2222 of the receiving device **102**, to the receiving device **102**.

After sending the signal **110**, the calling device **100** connects to the meeting point server **108**, which may have an IP address such as 165.113.223.2. The connection with the meeting point server **108** may be via the appropriate base station **106**. The meeting point server **108** may set up a communication channel with the receiving device **102** on the meeting point server **108** and direct the calling device **100** to that channel.

In one embodiment, the only information held in common by the calling device **100**, the meeting point server **108**, and the receiving device **102** is the phone number of the receiving device **102**. In this embodiment, the meeting point channel on the meeting point server **108** may have an address formed by combining the phone number of the receiving device **102**, i.e. 2222, with the IP address of the meeting point server **108**, i.e. 165.113.223.2. Thus, the address of the meeting point channel might be of the form 2222@165.113.223.2. The number 2222 is derived from the number of the receiving device **102**, while the IP address 165.113.223.2 is derived from the address of the meeting point server **108**.

In one embodiment, the meeting point channel has been prearranged, and both the receiving device **102** and the calling device **100** are aware of the address of the meeting point channel on the meeting point server **108**. In this embodiment, when the receiving device **102** with number 2222 receives the short ringing tone, the receiving device **102** will go to the predetermined, or default, meeting location represented by 2222@165.113.223.2, to commence communication with the calling device **100**. In this embodiment, the receiving device with number 2222 may own the channel represented by 2222@165.113.223.2, and ownership of meeting point channel is established thereby.

In another embodiment, the receiving device **102** may only be aware of the IP address of the meeting point server **108** along with, of course, its own phone number. In this embodiment, there may be a prearranged protocol between the calling device **100** and a receiving device **102** in which it is understood that sending the signal **110** to the receiving device **102** indicates that there is a meeting point channel waiting on the meeting point server **108**. It may further be understood that the address of the meeting point channel will be formed from the phone number of the receiving device **102** and the IP address of the meeting point server **108**.

In this embodiment, when the receiving device **102** with a phone number 2222 receives the short ringing tone, the receiving device **102** will perform home calling. In this embodiment, the receiving device **102** will go to the meeting point server **108**, where the meeting point server **108** will transfer the receiving device **102** to its home meeting point channel represented by 2222@165.113.223.2. The receiving device **102** will then commence communication with the calling device **100**. Thus, the receiving device **102** will be able decipher the address of the meeting point channel from its own phone number and an address of the meeting point server **108**.

In yet another embodiment, the signal **110** may include tones representative of the address of the meeting point channel on the meeting point server **108**. In this embodiment, the receiving device **102** may be unaware of the address of the meeting point server **108**. In this embodiment, rather, the receiving device **102** may be able to interpret the tones of the signal **110** to decipher the address of the meeting point channel on the meeting point server **108**.

It may be possible, furthermore, for the receiving device **102** to decipher the address of the meeting point channel without answering the call represented by the signal **110**. This may be the case if, for example, the receiving device **102** has "caller ID," or an analogous function in which the telephone number or other information of the calling device **100** are represented on a display of the receiving device **102**. In the alternative, the receiving device **102** may answer the signal **110**, and remain connected to the calling device **100** via the signal **110** long enough to receive the information representing the address of the meeting point channel on the meeting point server **108**, after which the receiving device **102** will hang up.

The calling device **100** may need to know the number of the receiving device **102**, and both the calling device **100** and the receiving device **102** may need to know the corresponding IP address of the gateway or the meeting point server **108**. The calling device **100** can make the calls by a click of the "VoIP Call" button. For the receiving device **102**, a "VoIP Accept" button will be used to receive the call.

In one embodiment, the calling format used with a dedicated mobile phone handset, or a mobile phone with a built-in function to store the gateway (or MPS) IP address, is the number of the receiving device, such as 2222. In this embodiment, pressing, for example, a "VoIP Call" button calls the number of the receiving device. There is no need to type in the IP address explicitly since the IP address is stored inside the phone. The indirect meeting point channel (IMPC), such as 2222@165.113.223.2, can be established automatically after the short ringing tone. Therefore, only the receiving device number is needed to be known by the user.

In one embodiment, a calling format for a mobile phone without a built-in function to store the gateway IP address may be 2222@165.113.223.2. After pressing the "VoIP Call" button, the system will send a short ringing tone to the receiving device number 2222 and set up the indirect meeting point channel as 2222@165.113.223.2.

In one embodiment, the channel 2222@165.113.223.2 may be entered as two separate items. The number of the receiving device **102**, e.g. 2222, is entered in the number field. The IP address, such as 165.113.223.2, is entered in, e.g. the gateway field. This calling format can also be used when the gateway IP address is somewhere on the Internet, and is different from the default IP address, e.g. 165.113.223.2. In this case, a transfer function from the gateway IP to the default IP address may be provided.

Mobile phone calls can also be made when no default gateway or default IP address is available at all. Instead, the base station **106** or any PC with VoIP on the Internet can be used as the meeting point server **108**. In this case, the calling device **100** should have the ability to send a short ringing tone and transmit the meeting point IP address to the receiving device **102**. This allows an indirect meeting point channel to be established without the involvement of a default gateway.

Note that by having a default gateway such as the meeting point server **108**, the short signal (or ringing tone) can be sent by the gateway promptly and uniquely. Without a default gateway, the calling device **100** would need to send the meeting point information to the receiving device **102**, although the software inside the mobile phone can program this.

After the calling device **100** sends the signal **110** to the receiving device **102** indicating that a meeting point channel has been established on the meeting point server **108**, the calling device **100** connects to the meeting point channel as well.

In one embodiment, a meeting point channel and a gateway is dedicated on the server. In this embodiment, the calling device **100** connects to the server and the server sends the signal **110** to the receiving device **102** indicating that a meeting point channel has been established on the meeting point server **108**. In one embodiment, the calling device **100** will be transferred to the meeting point channel address. The meeting point channel address may be in the form of the phone number of the receiving device **102** and an address of the meeting point server **108**, as discussed above. In one embodiment, the meeting point server **108** may provide music or other entertainment for attendees of the meeting while they wait for the other attendees to arrive.

After receiving the signal **110**, the receiving device **102** will connect with the meeting point channel at the meeting point server **108** as well, in order to communicate with the calling device **100**. If the receiving device **102** arrives at the meeting point channel before the calling device **100**, the receiving device **102** may wait for the calling device **100**. In one embodiment, the meeting point channel will be "owned" by the receiving device **102**. This embodiment establishes ownership of the meeting point channel and may offer better control and avoid confusion.

In one embodiment, the calling device **100** or the receiving device **102** may set up the meeting point channel on the meeting point server **108** by calling its own number. In this embodiment, the meeting point server **108** will set up a meeting point channel with an address in the form of the phone number of the calling device **100** or the receiving device **102** combined with an address of the meeting point server **108** itself. Setting up a meeting point channel by calling its own phone number may be referred to as "home calling." In one embodiment, the number dialed by the calling device **100** or the receiving device **102** includes a prefix and an extension.

In one embodiment, home calling is operable both nationally and internationally, thus circumventing barriers posed by incompatible methods of caller ID transmission. In one embodiment, home calling dispenses with the need for alternative notification methods, such as short message service (SMS) messages. In one embodiment home calling is operable for a calling device **100** served by a communication network that is incompatible with that serving receiving device **102**. In this embodiment, for example, the signal **110** will indicate to the receiving device **102** that someone is waiting to talk even if the receiving device **102** is on a network that is incompatible with the calling device **100**.

In one embodiment, after sending the signal **110**, the calling device **100** and the receiving device **102** agree on a fixed meeting point channel on the meeting point server **108**. An address of the fixed meeting point channel may have a specific format, such as a number at the IP address of the meeting point server **108**. In one embodiment, every prospective participant of the call must be aware of the address of the fixed meeting point channel.

In another embodiment, after sending the signal **110**, the meeting point server **108** may arrange for both the calling device **100** and a receiving device **102** to connect to an unoccupied meeting point channel. In this embodiment, the meeting point server **108** can transfer the calling device **102** to the unoccupied meeting point channel when the calling device **102** contacts the meeting point server **108**. For this embodiment, the meeting point server may need to know an identification number of the receiving device **102**, such as the phone number of the receiving device **102**, so that the meeting point server **108** can also transfer the receiving device **102** to the correct meeting point channel where the calling device **100** is waiting.

In another embodiment, a substitution number is associated with each number registered to the meeting point server **108**. In this embodiment, after sending the signal **110**, a meeting point channel is generated using the substitution number for the number of the receiving device **102**. After receiving the signal **110**, the receiving device **102** calls the substitution number to meet the calling device **100** and communicate. In this embodiment, each device will need to be aware of two numbers, the substitution number and its own phone number.

In one embodiment, the owner of the meeting point channel, i.e., the receiving device **102**, may have the right to close the meeting point channel at any time. In another embodiment, the owner of the meeting point channel, i.e. the receiving device **102**, may be allowed to ask all other devices connected to the meeting point channel to hang up.

In the alternative, the receiving device **102** may decline the communication, in which case no further communication takes place between calling device **100** and receiving device **102**. In a further alternative, receiving device **102** could respond by counter-offering an alternate meeting point channel, connecting thereto and awaiting the response of calling device **100**. If calling device **100** accepts the counter-offer, and connects to the alternate meeting point channel, communication commences with receiving device **102** as well.

The transceiver **104**, base station **106**, or meeting point server **108** are all capable of transmitting the signal **110** received by receiving device **102**. The signal **110** may be a ringing tone generated by a GSM network, or it may be generated by the base station to which the calling device **100** is currently tethered, a computer, a public switched telephone network gateway, a modem, or a switch box for use with the public switched telephone network.

If the meeting point server **108** is used to generate the short signal ringing tone, the ringing tone can also be generated with a public switched telephone network gateway, a modem, or a switch box for use with the public switched telephone network. Finally, the short signal ringing tone can be generated by a transceiver or an antenna associated with the indirect communication system.

As shown in FIG. **2**, the meeting point server **206** included with the indirect communication system may include a generator **214**, a sender **216**, a meeting point creator **218**, a meeting point channel **220**, and a redirector **222**. The generator **214** generates a signal **212** in response to an instruction from a calling device **200**. The generated signal **212** is a two-ring ring tone or a short signal. The sender **216** is a notifier notifying a receiving device **202**, which may be a mobile phone, of a prospective communication in response to an instruction from a calling device **200**, which may also be a mobile phone. If the calling device **200** is a mobile phone, the calling device **200** may reduce airtime charges by using a generated signal to alert the receiving device **202** of a prospective communication, but conducting the actual communication elsewhere.

The meeting point creator **218** generates the meeting point channel **220** in response to the instruction from calling device **200**. The meeting point channel **220** may be created after the calling device **200** has established connection with the meeting point server **208**. The establishment of meeting point channel **220** on the server enables signal **210** from the calling device **200** and signal **212** from the receiving device **202** to meet at meeting point channel **220** and form a communication path between the calling device **200** and the receiving device **202** through the meeting point channel **220**.

The communication, however, may not be directly from calling device **200** to receiving device **202**. Calling device **200** and receiving device **202**, rather, each communicate separately with meeting point channel **220**, and meeting point channel **220** redirects their respective communications to the appropriate destinations. Therefore, airtime minutes may be reduced by communicating through meeting point channel **220**, such as over the Internet using VoIP, rather than over the air.

The meeting point channel **220** may include a redirector **222**. The redirector is capable of receiving converted Voice over Internet packets from the calling device **200** and redirecting the Voice over Internet packets to the receiving device **202**, and vice versa. The Voice over Internet packets are sent directly to the meeting point channel **220** from either the calling device **200** or the receiving device **202**. The VoIP packets are then redirected to the destination device by changing the destination address on packet to the address of either the calling device **200** or receiving device **202**, as appropriate. The roles of the calling device **200** and the receiving device **202** may be reversed, without loss of generality.

In another embodiment, as shown in FIG. **3**A, an indirect communication system may include a meeting point server **308***a*, which is capable of receiving a communication from a calling device **300***a* or a receiving device **302***a* via base stations **306***a* and **307***a*. Either the calling device **300***a* or the receiving device **302***a*, or both, may be a mobile phone.

The calling device **300***a* may have a phone number 1111. The calling device **300***a* places a call to the receiving device **302***a*, which may have a phone number 2222. In one embodiment, the calling device **300***a* calls the receiving device **302***a* by sending the signal **312***a* in the form of a short ringing tone, the signal **312***a* may include no information or no instructions such as a caller ID of the calling device **300***a*.

After sending the signal **312***a*, the calling device **300***a* connects to the meeting point server **308***a*, which may have an IP address such as 165.113.223.2. The connection with the meeting point server **308***a* may be via the appropriate base station **306***a*. In this embodiment, the meeting point server **308***a* may set up a communication channel with the receiving device **302***a* dynamically and putting the calling device in that channel waiting for the receiving device **302***a*. The meeting point channel may be 2222@165.113.223.2, where the first number 2222, in this case, may be used to identify the receiving device. In the case of no information available from the signal **312***a*, the number of the receiving device can be used to complete the connection.

After the receiving device **302***a* with a phone number 2222 receives the short ringing tone, the receiving device **302***a* may make a call with its own number such as 2222@165.113.223.2. By direct dialing this call using the receiving device will connect the receiving device to the meeting point server **308***a* and transfer to the meeting point channel 2222@165.113.223.2, to commence communication with the calling device **300***a*. Dialing its own number is called home calling. In this embodiment, the receiving device **302***a* is just like to go home and meeting someone.

In another embodiment, the calling device **300***a* making a call to the receiving device by a direct dialing 2222@165.113.223.2. This action connects the calling device to the meeting point server **308***a* by identifying the IP address 165.113.223.2. The server **308***a* may then send the signal **312***a* to the receiving device **302***a* with number 2222. After sending the signal, the server **308***a* generates the meeting point 2222@165.113.223.2 and put the receiving device into this channel waiting for the receiving device to make a home calling.

Alternatively and depending on the network of the base station **307***a*, the calling device **300***a* may capture the voice data and converts it to an "Outgoing VoIP Packet". In this embodiment, the job of the base station **307***a* is just passing the packet to the meeting point channel inside the meeting point server.

In another embodiment, when both calling and receiving device have the meeting point server **308***a* IP address stored as parameter or built-in function, the operation of home calling is the same as dialing its own number on the device.

In another embodiment, the receiving device 2222 may own the meeting point channel 2222@165.113.223.2 inside the server **308***a*. Establishing ownership of meeting point channel may allow the owner to perform administration work such as close the meeting point channel at any time forcing people inside the channel to hang up.

In another embodiment, as shown in FIG. **3**B, an indirect communication system may include a meeting point server **308**, which is capable of receiving a communication from a calling device **300** or a receiving device **302** via base stations **306** and **307**. Either the calling device **300** or the receiving device **302**, or both, may be a mobile phone.

Both the calling device **300** and a receiving device **302** may connect to the meeting point server **308** after a signal **312** is sent by the calling device **300** to the receiving device **302**. In this embodiment, the signal **312** may include information or instructions such as a caller ID of the calling device **300**, an address of the meeting point server **308** or an alternate meeting point, or a callback number.

After the calling device **300** and the receiving device **302** are connected to the meeting point server **308**, the calling device **300** and a receiving device **302** may begin sending information meant for their opposite party to the meeting point server **308**. The meeting point server **308** may then redirect the communication to the respective calling device **300** or receiving device **302**. Therefore, airtime minutes may be reduced by enabling both calling device **300** and receiving device **302** to communicate with each other using VoIP, through meeting point server **308**, thereby lowering the cost of communicating and increasing the quality of phone communication.

In one embodiment, redirection works as follows. The calling device **300** sends a short ringing tone to the receiving device **302**, and connects to the base station **306**. The base station **306** and may have an IP address such as BS**1**_IP. The details of the address BS**1**_IP may be known by a calling device **300** when the calling device **300** connects to the base station **306**. After receiving the short ringing tone, the receiving device **302** connects to the base station **307**. The base station **307** may have an IP address such as BS**2**_IP.

The meeting point server **308** may be located on the Internet at an IP address such as 165.113.223.2. The IP address of the meeting point server **308** may be known to the calling device **300**, or the base station **306**, or both. The calling device **300** connects to the base station **306** with the IP address BS**1**_IP. The base station **306** with the IP address BS**1**_IP captures the voice data from the calling device **300** and converts it to an "Outgoing VoIP Packet". The outgoing IP packet has a header, according to which the outgoing IP packet is being sent from the base station **306** at the IP address BS**1**_IP to the address of the meeting point server **308** (i.e. 165.113.223.2). The base station **306** at the IP address BS**1**_IP sends this packet to the meeting point server **308**.

When the outgoing packet from the base station **306** at the IP address BS1_IP arrives at the meeting point server **308**, the meeting point server **308** changes the destination address in the header of the IP packet. The meeting point server **308** changes the destination address from 165.113.223.2, which is the address of the meeting point server **308**, to BS2_IP, which is the IP address of the base station **307** associated with receiving device **302**. The meeting point server **308** then sends the IP packet to the base station **307**.

When the base station **307** with the address BS2_IP receives the packet, it will consider it to be an incoming VoIP packet and pass the voice content to the receiving device **302**. In this way, communication from the calling device **300** to the receiving device **302** is established. Similarly, communication can be established from the receiving device **302** to the calling device **300**, i.e. in the reverse direction, by changing the destination address of each IP packet from 165.113.223.2, the address of the meeting point server **308**, to BS1_IP, the IP address of the base station **306** associated with calling device **300**. The roles of the calling device **300** and the receiving device **302** may be reversed, without loss of generality.

As shown in FIG. **4**, the meeting point server **408** included with the indirect communication system may include a generator **414**, a sender **416**, a meeting point creator **418**, a meeting point channel **420**, and a redirector **422**. The generator **414** generates a signal in response to an instruction from a calling device. The generated signal is a two-ring ring tone or a short signal. The sender **416** is a notifier notifying a receiving device of a prospective communication in response to an instruction from a calling device. Therefore, if the calling device is a mobile phone, then the calling device will reduce airtime charges by using a generated signal to alert the receiving device of a prospective communication.

The meeting point creator **418** generates the meeting point channel **420** in response to the instruction from the calling device. The meeting point channel **420** may be created after the calling device has established connection with the meeting point server **408**. The establishment of meeting point channel **420** on the meeting point server **408** enables the calling device and the receiving device to meet at the meeting point channel **420** and communicate with each other, without using further airtime.

In FIG. **5**, there is shown a base station **506** included in an indirect communication system that may also include a calling device **500**, which may be a mobile phone, and a receiving device **502**, which may also be a mobile phone, as well as other devices. The base station **506** may be a computer with a transceiver, and a connection to either calling device **500** or receiving device **502**, and is equipped with VoIP capability, a public switched telephone network gateway, a modem, and/or a switch box for connection to the public switched telephone network. The base station **506** is capable of transmitting a signal **512** upon receiving instructions from the calling device **500**. The signal **512** is capable of notifying the receiving device **502** of a prospective communication. The roles of the calling device **500** and the receiving device **502** may be reversed, without loss of generality.

In FIG. **6**, there is shown a transceiver **604** included in an indirect communication system that may also include a calling device **600**, which may be a mobile phone, and a receiving device **602**, which may also be a mobile phone, as well as, other devices. The transceiver **604**, represented by an antenna, is capable of transmitting a signal **612** upon instructions from the calling device **600**. The signal **612** is capable of notifying the receiving device **602** of a prospective communication via broadcast. The roles of the calling device **600** and the receiving device **602** may be reversed, without loss of generality.

In FIG. **7**, there is shown a meeting point server **708** included in an indirect communication system that may also include a calling device **700**, which may be a mobile phone, and a receiving device **702**, which may also be a mobile phone, as well as other devices. The meeting point server **708** is for example a computer on the Internet, having an address or a domain name, or a base station. The address may be fixed to avoid confusing it with an address of a base station. In the alternative, the domain name of the meeting point server **708** could be kept constant, while the address is allowed to change.

The meeting point server **708** may also be equipped with a public switched telephone network gateway, a modem, and/or a switch box related to the meeting point server **708**. The meeting point server **708** is capable of transmitting the signal **712**. The signal **712** is capable of notifying the receiving device **702** of a prospective communication. The meeting point server **708** re-directs packets sent to it from the calling device **700** to the receiving device **702**, and vice versa. The roles of the calling device **700** and the receiving device **702** may be reversed, without loss of generality.

In FIG. **8**, there is shown a calling device **800** included in an indirect communication system that may also include a receiving device **802**, which may be a mobile phone, as well as other devices. The calling device **800** can generate a signal **812**. The generated signal **812** is received via a Global Systems for Mobile Communication (GSM) network. Calling device **800** could be provided with hardware or software for transmitting the short, two ring, signal, connecting to the Internet, and setting up a meeting point channel, either directly or through a base station or the public switched telephone network.

The software could be downloaded to the calling device **800** and a receiving device **802**, which may be also be a mobile phone, over the cellular network. In this case the calling device **800** and the receiving device **802** may be programmable and controllable by a third-party to download the software. The software may include a menu, an interface, radio boxes, check boxes, and option press buttons. The calling device **800** and receiving device **802** may also have a switch to switch to the meeting point channel after sending the short, two-tone signal over the cellular network.

The calling device **800** and the receiving device **802** may have a built-in function to store the address of the meeting point server, such as a default gateway. In that case there would be no need to type the address explicitly. Only the phone number of the receiving device **802** would be necessary in order to form the address of the meeting point server. The roles of the calling device **800** and the receiving device **802** may be reversed, without loss of generality.

As shown in FIG. **9**, the meeting point server **908** includes a meeting point channel **920**. A calling device **900**, which may be a mobile phone, calls the meeting point server **908** to set up a call to a receiving device, which may also be a mobile phone. The meeting point server **908** may have a plurality of meeting point channels **920** for multiple communications. The meeting point channel **920** is identified by an address of a receiving device and either an Internet Protocol address or a Domain Name System name. A typical meeting point channel **920** identification channel may be in the form of an email address.

If the phone number of a receiving device is 22222 and either the Internet Protocol address is 165.113.223.2 or the

Domain Name System name is www.mps_VoIP.com, then the channel location may be 22222@165.113.223.2 or 22222@www.mps_VoIP.com. Therefore, a receiving device would have the information necessary to connect to the channel **920** after connecting to the meeting point server **908**, which would then complete the call to the calling device **900**.

In FIG. **10**, there is shown a meeting point server **1008** having a meeting point channel **1020**. A calling device **1000**, which may be a mobile phone, and a receiving device **1002**, which may also be a mobile phone, meet in the meeting point channel **1020**, after the meeting point channel **1020** is created in the meeting point server **1008**. The roles of the calling device **1000** and the receiving device **1002** may be reversed, without loss of generality.

In FIG. **11**, there is shown a meeting point server **1108** including a meeting point creator **1118** and an alternate meeting point channel **1120**. The alternate meeting point channel **1120** is created when a receiving device **1102** selects "alternative meeting point location". The meeting point creator **1118** creates the alternate meeting point channel **1120**. Sometimes, the alternative meeting point channel **1120** may be in another meeting point server somewhere on the Internet.

The alternative meeting point channel **1120** receives a connection from a calling device **1100**, which may be a mobile phone, and a receiving device **1102**, which may also be a mobile phone. Therefore, an advantage of the alternative meeting point channel **1120** is that a communication can be established at any channel in the meeting point server **1108**. The roles of the calling device **1100** and the receiving device **1102** may be reversed, without loss of generality.

In another embodiment, shown in FIG. **12**, an indirect communication system includes a dedicated meeting point server **1208**. The meeting point server **1208** is capable of receiving an instruction from a personal computer **1200** with VoIP capability. The instructions received include the number of a receiving device **1202**, which may be a mobile phone, and an Internet Protocol address, for example 88.169.11.1, in a gateway field. By having a dedicated meeting point server **1208**, the meeting point server **1208** is capable of transmitting a two-ring ring tone or short signal **1212**.

The computer **1200** may then wait for the receiving device **1202** to connect to the meeting point channel **1220** in the meeting point server **1208**. The meeting point server **1208** is also capable of receiving a connection from the receiving device **1202**, via a base station **1206**. The base station **1206** is a nearest base station to the receiving device **1202**. The computer **1200** will thus be able to communicate with another mobile phone using VoIP, without actual knowledge of where the receiving device is located.

In another embodiment, shown in FIG. **13**, an indirect communication system includes a meeting point server **1308**. The meeting point server **1308** is capable of receiving an instruction from the calling device **1300**, which may be a mobile phone, via a base station **1306** instructing the meeting point server **1308** to connect to a computer **1302** with VoIP capability. The instruction includes an address of the computer **1302**, and an address of meeting point server **1308**. The meeting point server **1308** is capable of having a meeting point channel **1320** identified by the address of the computer **1302** and the address of the meeting point server **1308**.

If, for example, an address of the computer **1302** is 66.168.100.2, and an address of the meeting point server **1308** is 250.19.2.10, the address of the meeting point channel might be 66.168.100.2@250.19.2.10. In one embodiment, the computer **1302** is capable of being a meeting point as well. In this case the calling device **1300** would enter an address of the receiving computer **1302**, allowing the calling device **1300** to directly connect, via a base station, to the computer **1302**.

A PC with broadband and VoIP may be called from the calling device **1300** as well. In the case of a direct VoIP call, the IP address of the receiving computer **1302**, such as 66.168.100.2, would be entered at the calling device **1300**. In this case, the meeting point is on the receiving computer **1302** (i.e. 66.168.100.2).

Alternatively, in the case of calling via the meeting point server **1308**, the IP address of the receiving computer **1302**, such as 66.168.100.2, or the IP address of the meeting point server **1308**, such as 165.113.223.2, could be entered. In another embodiment, the IP address of the meeting point server **1308** can be a dedicated MPS or any other PC with VoIP. Also, from an application point of view, a PC with VoIP is equivalent to a SIP phone, so that the communication format in this section can also apply to an SIP phone.

In another embodiment, shown in FIG. **14**, an indirect communication system uses a meeting point server **1408** to establish a connection between the calling computer **1400** with modem **1401** and a receiving device **1402**, which may be a mobile phone. The meeting point server **1408** receives an instruction from the calling computer **1400**, which has a modem, notifying the receiving device **1402** of a prospective communication. The instructions include the phone number of the receiving device **1402** and an address of the meeting point server **1408**.

The meeting point server **1408** transmits a generated signal **1412** to the receiving device **1402**. The meeting point server **1408** creates a meeting point channel **1420** based upon the phone number of the receiving device **1402** and the address of the meeting point server **1408**. The calling computer **1400** waits for the receiving device **1402** to connect to the meeting point server **1408** after establishing connection to the meeting point server **1408**. The meeting point server **1408** is capable of receiving VoIP packets directed to the meeting point server **1408** from the calling computer **1400**, and redirecting the VoIP packets to the receiving device **1402**. Therefore, the system allows a mobile phone to communicate with another device over the Internet, while saving money and having quality phone calls.

In one embodiment, a mobile phone may be called from a PC, which may have broadband and VoIP. In this embodiment, the VoIP client (software) is activated, and the number of the receiving device, such as 2222, is entered, along with the IP address of the meeting point server (MPS), such as 88.192.168.11.1. Note that many VoIP software clients specified by the ITU H.323 standard should contain fields for the phone number and the gateway address. If the MPS is a dedicated MPS, the MPS can generate the short ringing tone and wait for connection from the receiving device.

In another embodiment, shown in FIG. **15**, an indirect communication system includes a meeting point server **1508** capable of transmitting a signal **1512** and creating a meeting point channel **1520**. The signal **1512** is generated when the meeting point server **1508** receives an instruction from a calling device **1500**, which may be a mobile phone, via a base station **1506**. The instruction includes the phone number of the receiving computer **1502**, which has a modem **1501**, and the address of the meeting point server **1508**.

The meeting point server **1508** sends the generated signal to the receiving computer **1502**. The meeting point channel **1520**, in the meeting point server **1508**, is capable of receiving VoIP packets from the base station **1506**. The base station **1506** converts voice data, received from the calling device **1500**, into VoIP packets. The meeting point server **1508** is capable of redirecting the VoIP packets, which were directed to the meeting point server **1508**, to the receiving computer **1502** with modem **1501**.

In another embodiment, shown in FIG. **16**, an indirect communication system includes a meeting point server **1608** including a PSTN gateway **1630**. The meeting point server **1608** is capable of receiving a communication from a calling device, such as a phone **1600** using a public switched telephone network line via the PSTN gateway **1630**. The meeting point server **1608** is also capable of receiving a communication from a receiving device **1602**, which may be a mobile phone, via a base station **1608**. The meeting point server **1608** is also capable of transmitting a signal to the receiving device **1602** from the phone **1600** using the public switched telephone network line via the PSTN gateway **1630**, upon receiving instructions from the phone **1600**. The instruction includes a phone number of the receiving device **1602** and an address of the meeting point server **1608**.

The meeting point server **1608** creates a meeting point channel **1620**. The phone number of the receiving device **1602** and the address of the meeting point server **1608** are combined to identify the meeting point channel **1620**. The meeting point channel **1620** is capable of receiving VoIP packets, which were previously converted at the PSTN gateway **1630** when received from the calling device using a PSTN line **1601**. The meeting point channel **1620** is capable of redirecting the VoIP packets to the nearest base station **1606**, and from the base station **1606** to the receiving device **1602**. Therefore, the phone **1600** using a public switched telephone network line can call the receiving device **1602**, thereby allowing the mobile phone to incur low cost of communication and receive a quality phone call.

In one embodiment, a personal computer (PC) connected to a public switched telephone network line (ordinary phone line) with, for example, a modem can be used to make Internet connections through a dial up network. In this embodiment, the PC will dial a number to an Internet Service Provider (ISP) through a modem. The ISP would provide Internet access to the PC via the public switched telephone network line. Once connected to the Internet, a VoIP software client can be used to make a call to a mobile phone. The process is the same as calling from a PC (with broadband and VoIP) to a mobile phone.

In another embodiment, a computer connected to a public switched telephone network line with dial up network may be called from a mobile phone. First, the mobile phone makes a calling format such as 123456@165.113.223.2, where 123456 is the public switched telephone network phone number. The MPS sends a short signal to the modem and hangs up. The modem together with a specific software will activate the PC to connect to the Internet and the MPS, making the VoIP conversation possible.

In another embodiment, a mobile phone may be called from a standalone public switched telephone network line, such as a public switched telephone network line with no direct Internet access. In this embodiment, a public switched telephone network gateway may be installed in the MPS. If, for example, the telephone number for the public switched telephone network gateway is 464530, and the mobile phone number e.g. 2222, the first number can be used to form the connection between the phone 123456 and the public switched telephone network gateway inside MPS (i.e. 464530). Once connected to the MPS, the MPS can generate a short signal to mobile phone and making the final connection with the mobile phone by creating the meeting point channel 2222@165.113.223.2.

In another embodiment, a standalone public switched telephone network line, without direct Internet, may be called from a mobile phone. In this embodiment, a public switched telephone network gateway may be installed in the MPS with number 464530. A mobile phone (no. 2222) can make a call to a standalone public switched telephone network phone 123456 through the MPS and the public switched telephone network gateway. First, the number of the standalone public switched telephone network e.g. 123456, is entered, and a "PSTN Call" button, or similar option, is pressed. The mobile phone will connect to the MPS and organize a meeting point channel such as 2222@165.113.223.2. By entering the number 123456 and pressing the "PSTN Call", the mobile phone will instruct the MPS and the public switched telephone network gateway to dial out the number 123456.

In another embodiment, shown in FIG. **17**, an indirect communication system includes a meeting point server **1708** with a temporary meeting point channel **1720**. The meeting point server **1708** is connected to a phone **1702** over a PSTN gateway **1730** and a PSTN line **1712**. The meeting point server **1708** is capable of supporting a connection between a calling device **1700**, which may be a mobile phone, via a base station **1706**, and the phone **1702** using the PSTN line **1712**.

The meeting point server **1708** generates a signal to send to the phone **1702**, after receiving an instruction from the calling device **1700** via the base station **1706**. The instruction includes an address of the meeting point channel **1720** in the form of a combination of a phone number of the phone **1702** and the address of the meeting point server **1708**. The meeting point channel **1720** is able to receive VoIP packets, which were previously converted from voice data at the base station **1706** when received from the calling device **1700**. The meeting point channel **1720** is also capable of redirecting the VoIP packets to the PSTN gateway **1730**. The PSTN gateway **1730** uses VoIP software to convert the packets to voice data and transmit them to the phone **1702**.

In another embodiment, shown in FIG. **18**, an indirect communication system includes a meeting point server **1808** capable of receiving outgoing VoIP packets and redirecting the outgoing VoIP packets. The received outgoing VoIP packets are received from a base station **1806** of a calling device **1800**, which may be a mobile phone. The receiving outgoing VoIP packets include an IP header. The IP header includes a delivery address and a source address. The delivery address is an address of the meeting point server **1608**. The source address is an address of the base station **1806** of the calling device **1800**.

The meeting point server **1808** redirects the packets to base station **1807** of the receiving device **1802** by changing the delivery address from the address of the meeting point server **1808** to the address of the base station **1807** of a receiving device **1802**, which may also be a mobile phone. The meeting point server **1808** also changes the source address from the address of the base station **1806** of the calling device **1800** to the address of the meeting point server **1808**. This embodiment allows a mobile phone to communicate with any device using the Internet. The roles of the calling device **1800** and the receiving device **1802** may be reversed, without loss of generality.

In FIG. **19**, there is shown a process chart of an indirect communication method. In operation **1900**, the process begins. In operation **1902**, a signal is sent to a receiving device notifying the receiving device of a prospective. In operation **1904**, a calling device connects to a meeting point server. In operation **1906**, the meeting point server generates an indirect meeting point channel. In operation **1908**, a receiving device connects to the indirect meeting point server. In operation

1910, packets received from the calling device are redirected to the receiving device at the meeting point channel. In operation 1912, the process ends.

In FIG. 20, there is shown a process chart of address generation for use with an embodiment of the indirect communication method. In operation 2000, the process begins. In operation 2002, a public switched telephone network number of a meeting point server is entered. In operation 2004, a number of a mobile device is entered. In operation 2006, the meeting point server receives the number of the mobile device. In operation 2008, the meeting point server generates a signal including a short, two-ring tone, an address of the server, and the number of the mobile phone. In operation 2010, the mobile receiving device receives the signal. In operation 2012, the mobile receiving device connects to the meeting point server. In operation 2014, the meeting point server redirects packets received from the calling device to the receiving device. In operation 2016, the process ends.

In FIG. 21, there is shown a process of packet redirection for use with an embodiment of the indirect communication method. In operation 2100, the process begins. In operation 2102, a meeting point server receives incoming packets from a calling device. In operation 2104, the meeting point server converts the incoming packets to outgoing packets by replacing a delivery address with an address of a receiving device and replacing a source address with an address of the meeting point server. In operation 2106, the meeting point server sends the outgoing packets received from the calling device to the receiving device. In operation 2108, the process ends.

In FIG. 22, there is shown a process of setting up a meeting point channel for use with an embodiment of the indirect communication method. In operation 2200, the process begins. In operation 2202, a meeting point server receives a number of a receiving device and a VoIP call. In operation 2204, the meeting point server sets up a meeting point channel. In operation 2208, the meeting point server an address to the meeting point channel composed of the number of the receiving device and an address of the meeting point server. In operation 2210, the process ends.

In FIG. 23, there is shown a process of setting up a telephone call for use with an embodiment of the indirect communication method. In operation 2300, the process begins. In operation 2302, a VoIP call button is pressed on a calling device. In operation 2303, the calling device connects to a server. In operation 2304, the calling device sends a signal to a receiving device. In operation 2306, unless the receiving device is busy, the receiving device either declines the call, accepts the call, or counter-offers an alternate meeting point. In operation 2308, the receiving device declines. In operation 2310, the receiving device accepts, and connects to a meeting point server. In operation 2312, the receiving device counter-offers an alternate meeting point, and connects to the alternate meeting point. In operation 2314, the decline message of operation 2308 is sent to the meeting point server. In operation 2316, the process ends.

In FIG. 24, there is shown a meeting point server 2408 capable of supporting a connection between calling device 2400 and a plurality of receiving devices 2402, such as during a conference call. In this case, the meeting point server 2408 would copy each packet received from calling device 2400 inside a meeting point channel 2420 and redirect the copies to individual receiving devices 2402 connected to the meeting point channel 2420.

Each of the receiving devices 2402 would have formed a connection with meeting point server 2408 after receiving the short, two-tone signal, but without answering the call represented by the short, two-tone signal, or else hanging up immediately. Thus, each of the receiving devices 2402 would hear the calling device 2400. Mobile phones can join the conference call even when the conference call is already in progress. This can be done by making a connection with the meeting point channel or the hosting mobile phone. In a normal situation, when the meeting point channel is "2222@88.168.11.1," the hosting mobile phone number is 2222. Therefore, an advantage of the embodiment is that the indirect communication system allows any mobile device to communicate to with a plurality of devices through meeting point server 2408, such as by Voice over Internet Protocol (VoIP), while avoiding the use of airtime.

In FIG. 25, there is shown a meeting point server 2508 capable of supporting a connection between a plurality of calling devices 2500 and a plurality of receiving devices 2502, such as during a conference call. In this case, the meeting point server 2508 would copy each packet received from each of the calling devices 2500 inside a meeting point channel 2520 and redirect the copies to individual receiving devices 2502 at the meeting point channels 2520. Meeting point server 2508 could further support a plurality of meeting point channels 2520. Each of the plurality of meeting point channels 2520 could support, in turn, a plurality of calling devices 2500 or receiving devices 2502. Calling devices 2500 and receiving devices 2502 may be similar functionally, differing only in the current direction of communication from or to the meeting point server 2508.

Each of the receiving devices 2502 may have formed a connection with meeting point server 2508 after receiving the short, two-tone signal, but without answering the call represented by the short, two-tone signal, or else hanging up immediately. Thus, each of the receiving devices 2502 would hear each of the calling devices 2500. Therefore, an advantage of the embodiment is that the indirect communication system allows any mobile device to communicate with a plurality of devices through meeting point server 2508, such as by Voice over Internet Protocol (VoIP), while avoiding the use of airtime.

In one embodiment, the indirect communication system is implemented by manufacturing dedicated hardware mobile phones. In this way, the following new functions can be added along with the existing mobile features: transmitting and receiving compatible RF with wireless media such as WiMAX and connecting to a base station; generating an indirect ringing tone to receiving devices (mobile phones); setting up the Meeting Point Channel on the Internet with VoIP (e.g. a meeting point server); and communicating with the receiving device with VoIP.

By developing the dedicated mobile phone, full access and control of menu, interfaces including options, radio boxes, check boxes, and push button can be obtained. In this embodiment, the mobile phone circuit design may contain the hardware, such as a chipset.

In another embodiment, the indirect communication system is implemented by downloading software to a mobile phone, such as via the wireless media. Such a mobile phone may be a programmable mobile phone, which is controllable by a third party. The downloadable software may include a menu, an interface, radio boxes, check boxes, and option press buttons. The mobile phone may have the ability to generate or switch to the compatible RF with the wireless media connecting to the BS in order to communicate with the BS. Software for the mobile phones may be upgraded with new features, and additional functions may be added. In one embodiment, the indirect communication system could be implemented purely by software. In other embodiments, in addition to the wireless download, the download mechanism to mobile phones can also be a CD via a PC, direct or indirect memory card and stick, Internet Web Site, and others.

In another embodiment, an add-on device may be added to existing mobile phones, i.e. a two-way or Walkie-Talkie style phone, to implement the indirect communication system. In order to reach a wider range of mobile phone users, an add-on (or plug-in) hardware to be added at the bottom of the mobile phone may be provided. For this implementation, the add-on device turns the existing mobile phone into a "Two-way Walkie-Talkie" type. That is, the add-on device captures the voice at the mobile phone and transmits the signal to the BS via the wireless media. In one embodiment, the communication between the add-on device and BS is similar to a Walkie-Talkie. In addition to the hardware add-on device, the software inside the add-on device can also be software downloadable so that an up-grade is easily available.

In another embodiment, referring again to FIG. **1**, the calling device **100** and the receiving device **102** could be on different networks. In general, a voice over IP network can be considered to be an implementation of a particular "server" running on the Internet, and a particular piece of software (or hardware) known as a "client," which is installed on a computer or other device for making the connection. In some instances, one voice over IP network will not be able to make calls directly to another voice over IP network. This may be the case if, for example, there is an incompatibility between the implementations of the server from which the call originates, and the destination server, such as different protocols, standards, and proprietary issues.

This may also be the case if there is an incompatibility between the implementations of the clients, which may also be due to different protocols or standards, as well as to different usernames and passwords. The calling device **100** could be a GSM phone, for example, while the receiving device **102** is a CDMA phone. In this case, the calling device **100** does not need to know on what kind of network the receiving device **102** is operating.

The calling device **100**, rather, sends an instruction about the network of the calling device **100**, in addition to the short ringing tone, to the receiving device **102** when commencing the call. The receiving device **102**, after receiving the details of the network of the calling device **100**, can activate the appropriate client software to suit the network of the calling device **100**, and connect to the Internet **114** and the particular meeting point server **108**.

For one voice over IP network, only one piece of client software needs to be installed on the calling device **100**. The client software can be downloaded to the calling device **100**, and activated only when needed. This arrangement can reduce airtime since the voice over IP network will not need to be active, online, or on air, at all times.

## The Adoption of International Dialing Convention (IDC)

Due to a number of problems involving communication compatibility and identity (such as caller id) passing internationally, there is no straight-forward way to use IDC as phone number registration directly. This is one of the classic problems for all traditional telephone companies such as British Telecom (BT) or AT&T. This is also a problem for all Internet Phone companies such as Skype using the Internet as a communication tool.

In fact, this problem is due to the nature of direct communication and caller id passing. For our indirect communication method, we can provide a solution to solve this problem with our indirect communication method. That is, we can use IDC as registration number directly in our indirect system so that every existing phone number (old and new) of different countries can be under one single system to communicate freely.

## The Incorporation of Non-Phone Devices into Global Telephone Number System

Most of the Non-Phone devices such as an iPad, TabletPC, PC, etc are not designed to be used as a phone and therefore there is no phone number (or SIM card) associated with them. Also, there is no existing effective method to assign phone numbers to these devices or for integrating them with the existing phone number systems in the world effectively.

In this document, we provide a method and a numbering system so that non-phone devices can also be integrated into the public phone network number system. In general, we regard any internet-capable device which is not designed as a phone as a "Non-phone Device". Caller ID can also be transmitted legally for non-phone devices.

## Implementation of IDC with Indirect Communication System: IDC Direct Registration

To register an IDC number to our indirect system is straight-forward. This is due to the fact that every registered number in our system will be represented by a virtual meeting point. All communication (or talk) will take place inside the meeting point.

We just consider IDC as a normal phone number and nothing special. We can simply put the IDC number into the registration field directly.

Suppose, we have two existing phones with numbers as shown below. One of the phone is in the UK and one is in the USA.

+44 7927 176753—A mobile phone (12345678) in UK

+1 202 87654321—A phone (87654321) in Washington D.C., USA

To register the UK phone, all we need is to activate the prototype (we have a prototype working on iPhone) and enter the IDC number into the "Reg. Tel. No." field as illustrated below in FIG. **26**. For the USA phone we do the same thing.

Later in this document, we will show a similar method to register "Non-devices" into the Indirect Communication System.

## Implementation of IDC with Indirect Communication System: Call Initiation and Communication

As shown in FIG. **27**, call initiation and communication in an indirect communication system proceeds as follows. In this case, the phone numbers 1111 and 2222 in the figure are replaced by "+44 7927 176753" and "+1 202 87654321" respectively, i.e.

1111-->+44 7927 176753

2222-->+1 202 87654321

When the phone "+447927176753" makes a call to the phone "+120287654321", he/she just dials the number "+120287654321" directly.

The indirect system will activate the meeting point of the receiving phone, i.e.

"+120287654321@165.113.223.2"

Assuming the IP address of the indirect system is 165.113.223.2 as illustrated in FIG. **3**A.

The indirect system will also put the caller "+44 792 7176753" into the meeting point as a visitor waiting for the receiving phone to go on-line to his/her home (i.e. meeting point), meet the visitor and begin talking.

## Incorporating Non-Phone Devices into Global Phone Number Systems

### Assigning Phone Numbers for Non-Phone Devices Problems

Most of the Non-Phone devices such as iPad, TabletPC, PC, etc are not designed to be used as phones and therefore there is no phone number (or SIM card) associated with them. Also, there is no existing method to assign phone numbers for these devices and integrate them with the existing phone number systems in the world effectively.

Since many of these non-phone devices have the capability to connect to Internet using wireless (such as Wi-Fi, 3G Internet) or wired (direct Internet cable) connections, they can be converted to a phone (e.g. an Internet Phone) easily using our Indirect method with a suitable App (or application).

To be able to assign phone number to non-phone devices effectively and integrate them into the existing phone system (phone number system) is essential for telecommunication.

### Solution: Using Artificial Device Code (ADC)

With our indirect method, all these non-phone devices can also be assigned a compatible phone number using an "Artificial Device Code" (or ADC) together with one primary phone number. And Artificial Device Code (ADC) is similar to the country code used in the International Dialing Convention (IDC). To include Non-phone devices into the phone system, we simply need to create a new "country" code (which is non-existing). Consider the following example, shown in FIG. **28**.

For example, if you have one iPad **2804**, one TabletPC **2806**, one regular PC **2808**, and one mobile phone **2802** with a real number such as "+44 7793 12345", you can register your iPad **2804**, TabletPC **2806**, and regular PC **2808** in the indirect system such as

iPad **2804** phone number as +007 00 44 7793 12345

TabletPC **2806** phone number as +007 01 44 7793 12345

regular PC **2808** phone number as +007 99 44 7793 12345

where

+ is the International Dialing Prefix

007—is the Artificial Device Code (ADC)

00—the next two digits after the ADC is the sub-device number ranging from 00 to 99 (for example). In this case you can have 99 sub-devices.

44 7793 12345—after the sub-device number is the primary phone number associated with the non-phone device.

### Remarks

1. The primary number such as +44 7793 12345 can be any land-line or any mobile phone in the world.

2. Each primary number can have up to 99 sub-devices (or associated device numbers) in our indirect system having prefix "+007xx" or ADC code plus device number (i.e. +ADCxx)

For example, the primary phone number +44 77933 12345 can have up to 99 associated sub-device numbers as follows:

+00700 44 77933 12345

+00701 44 77933 12345

+00702 44 77933 12345

⋮

+00798 44 77933 12345

+00799 44 77933 12345

(Note: All numbers in FIG. **28** contains the International Dialing Prefix i.e. "+" sign)

3. The ADC code is not restricted to "007" and can be any digits and suitable format. Sometimes, a non-number string can also be used.

4. In order to identify non-phone devices and to avoid confusion, the ADC code should not be the same as any "Country Code" used today.

5. Sub-devices can be an "iPad", "PC", "tablet-PC" (e.g. Non-Phone devices).

6. Sub-devices can also be normal phone-devices such as another "iPhone" and/or "Android-Phone".

7. Sub-devices can register to our indirect system server as shown in FIG. **27**.

An implementation prototype using an iPad is shown in FIG. **29**. This non-phone device (an iPad architecture) was registered in our prototype communication server (code name: Speekezy) as follows:

| | |
|---|---|
| "+" | as International Dialing Prefix |
| 007 | as Artificial Device Code (ADC) |
| 03 | as Sub-device (i.e. the 3rd sub-device) |
| 44 7717 791168 | as Primary Number (a true number in UK) |

## Integrating with Existing Phone Number System and CallerID Transmission

### I. When an Internet Call and Connection is Used

Consider when the Internet is used (such as Wi-Fi) to connect two devices. As shown in FIG. **30**, a sub-device with number "+00 700 44 77933 12345" is making a call to another member of in the indirect system with number "+00 807 44 77933 54321", both sub-devices will be considered as individual phones by the system. In this case, a full callerID such as "+00 700 44 77933 12345" will be transmitted to the recipient.

The recipient device can simply return the call to this full ID (i.e. +00 700 44 77933 12345), reaching the caller with the system.

(Note: All numbers in FIG. **30** contain the International Dialing Prefix i.e. "+" sign)

### II. When GSM Call and Connection is Needed to Reach Outside Lines

Consider when GSM is used to call outside line. One typical example would be if sub-device "+00701 447793312345" is making a GSM call to an outside line "+441895222333" via the indirect system, as shown in FIG. **31**. The indirect system will cut the ADC code and sub-device range out and transmit the remaining number (i.e. the primary number) as a callerID.

+00701 44 77933 12345 Calls +44 1895 222 333

with caller id as +44 77933 12345

In other words, the indirect system will only transmit the primary number "+44 77933 12345" as callerID to the recipient. Since the primary number is a true number in the global telephone system, this process will be fully compatible with the international dialing convention and requirement.

The recipient can simply return the call with the primary number reaching back to the caller. In this case, the primary phone of the caller will ring (Not the sub-device) in this case.

By "GSM" call is used, we mean the system needs to access the public telephone network via the PSTN or mobile phone via the cellular network reaching the recipient device. In this case, the Internet connection of the recipient device may not be available or not turned on.

Remarks

1. For this to work, all non-Phone devices such as iPad, PC or TabletPC will need to be registered as sub-device of a primary number.

2. If you have one Blackberry (BB), three iPhones, two iPads, five PCs, and four Android-Phones, you can register all of these non-Phone devices plus some phone devices as sub-devices of the BB phone.

When a sub-device is making a GSM call, the recipient will receive the callerID of the BB phone. When the call is returned using GSM, your BB phone will ring.

There is NO requirement for the BB phone to be registered with the system. We only need to associate all sub-devices with a true phone number.

3. When the GSM network is needed to make a call from a sub-device (+00701 44 77933 12345) to another sub-device (+00807 44 77933 54321), as shown in FIG. **32**, that is also straight forward. The system will detect the ADC and sub-device range of both caller and callee. In this situation, the system will simply cut out the ADC and sub-device number of both caller and callee to make the GSM call. It is just like making a normal GSM call. In this case, the primary number of the callee will ring.

The Benefit of Incorporating Non-Phone Devices into Global Phone Number System

Every Single Existing (and New) Phones and Non-Phone Devices in the World are Included into ONE System

One obvious benefit of incorporating phone and non-phone devices is that every capable device, old or new, in the world regardless the country and region status are included in one phone number system.

All capable devices (mobiles, landline phones, PCs, iPads, Tablets) and communication are under one roof, one company, or one system.

You don't need to change to a new phone number. Your existing number can be used and registered to our system directly. Adding sub-devices is simple.

You don't need to change your phone contacts or your address book. You can use your phone contacts to make a call directly. Your friends and family can call you using phone contacts without changing anything no matter what countries they are in. This capability is also extended to non-phone devices.

Consistent CallerID Transmission

Non-Phone devices such as iPad, Tablet PC, PC, Mac, etc. . . . can have legal caller ID in the global phone number system. All caller ID transmission will be consistent with the international standard.

Different ADC can represent different non-phone devices (i.e. Different categories). Even in this situation, caller ID transmission is still legitimately represented by the same primary number.

For example, we can create the ADC (or Artificial Device Code) such as +007 to represent an iPad. It's just like creating a new "Country Code" for the iPad. Similarly, we can create a new country code for each new device type:

+007xx xxxxxxxxxxxx—Country code 007 to represent all iPad +004xx xxxxxxxxxxxx—Country code 004 to represent all PC.

When a GSM call is required, the primary phone number will be transmitted as callerID and be fully compliant with the international callerID transmission requirement.

Easy Adoption by Big Telephone Companies

For some big companies such as AT&T or BT, to adopt our system is easy. Since they already have millions of existing phone numbers, they can simply include all their numbers into our system. That will include all non-phone devices existing today and future. In this case, the world will have only ONE very big telephone company at the end.

In one embodiment, as shown in FIG. **33**, a communication system **3300** may have a first transceiver **3302** which has a first identifier **3304** and a second transceiver **3306** which has a second identifier **3308**. The first transceiver **3302** may be a handset, a phone, a gateway, a base station, a server, a cell tower, a transceiver, a computer, a palm top, a laptop, a tablet, or a personal digital assistant. The second transceiver **3306** may be a handset, a phone, a gateway, a base station, a server **3340**, a cell tower, a transceiver, a computer, a palm top, a laptop, a tablet, or a personal digital assistant.

The first identifier **3304** may be an identification number of the first transceiver **3302**, a phone identifier, a series of digits, a GSM identifier, an International Dialing Convention identifier, a mobile phone identifier, or a land-line telephone identifier. The second identifier **3308** may be an identification number of the second transceiver **3306**, a phone identifier, a series of digits, a GSM identifier, an International Dialing Convention identifier, a mobile phone identifier, or a land-line telephone identifier.

A first sub-device **3310** may have a first sub-identifier **3312** comprised of the first identifier **3304** and a first device code **3314**. The first sub-identifier **3312** may be an artificial device code, a sub-device identifier assigned to the first transceiver **3302**, or the first identifier **3304**. The artificial device code and the sub-device identifier may be removed to call an outside line.

A second sub-device **3316** may have a second sub-identifier **3318** comprised of the second identifier **3308** and a second device code **3320**. The second sub-identifier **3318** may be an artificial device code, a sub-device identifier assigned to the second transceiver **3306**, or the second identifier **3308**.

A first communication channel **3322** may exist between the first sub-device **3310** and the second sub-device **3316**. A first transmission of information **3326** may emanate from the first sub-device **3310** on the first communication channel **3322** identified by the first sub-identifier **3312**.

A second communication channel **3324** may exist between the first sub-device **3310** and the second transceiver **3306**. A second transmission of information **3328** may emanate from the second sub-device **3316** on the first communication channel **3322** identified by the second sub-identifier **3318**.

A third transmission of information **3330** may emanate from the first sub-device **3310** on the second communication channel **3324** identified by the first identifier **3304**.

A fourth transmission of information **3332** may emanate from the second transceiver **3306** on the second communication channel **3324** identified by the second identifier **3308**.

In another embodiment, as shown in FIG. **34**, a method of communication **3400** may start by applying a first identifier to a first transceiver and applying a second identifier to a second transceiver, as shown in operation **3402**.

The method of communication may continue by applying a first sub-identifier to a first sub-device comprised of the first identifier and a first device code, as shown in operation **3404**.

The method of communication may continue by applying a second sub-identifier to a second sub-device comprised of the second identifier and a second device code, as shown in operation **3406**.

The method of communication may continue by providing a first communication channel between the first sub-device and the second sub-device, as shown in operation **3408**.

The method of communication may continue by providing a second communication channel between the first sub-device and the second transceiver, as shown in operation **3410**.

The method of communication may continue by transmitting first information from the first sub-device on the first communication channel identified by the first sub-identifier, as shown in operation **3412**.

The method of communication may continue by transmitting second information from the second sub-device on the first communication channel identified by the second sub-identifier, as shown in operation **3414**.

The method of communication may continue by transmitting third information from the first sub-device on the second communication channel identified by the first identifier, as shown in operation **3416**.

The method of communication may continue by transmitting fourth information from the second transceiver on the second communication channel identified by the second identifier, as shown in operation **3418**.

In another embodiment, as shown in FIG. **35**, a communication system **3500** may have a first transceiver **3502** which has a first identifier **3504** and a second transceiver **3506** which has a second identifier **3508**.

A server **3540** may have a third identifier **3538**. The server **3540** may be a computer, a base station, a handset, a Voice over Internet Protocol handset, a Voice over Internet Protocol controller, a switch box, or a dedicated black box device and peripherals. An address of a meeting point on the server **3540** may be an identification identifier of the second transceiver **3506** and an Internet Protocol address or a Domain Name System name of the server **3540**.

A first sub-device **3510** may have a first sub-identifier **3512** comprised of the first identifier **3504** and a first device code **3514**.

A second sub-device **3516** may have a second sub-identifier **3518** comprised of the second identifier **3508** and a second device code **3520**.

A first communication channel **3522** may exist between the first sub-device **3510** and the second sub-device **3516**.

A second communication channel **3524** may exist between the first sub-device **3510** and the server **3540**, the second communication channel **3524** not concurrent with the first communication channel **3522**. The second communication channel **3524** may be packets formatted with a format such as Voice over Internet Protocol, Internet Protocol, or User Datagram Protocol.

A third communication channel **3534** may exist between the second sub-device **3516** and the server **3540**, the third communication channel **3534** not concurrent with the first communication channel **3522**. The third communication channel **3534** may be packets formatted with a format such as Voice over Internet Protocol, Internet Protocol, or User Datagram Protocol.

A first transmission of information **3526** may be transmitted from the first sub-device **3510** on the first communication channel **3522** identified by the first sub-identifier **3512**. If the second transceiver **3506** accepts the first transmission, the second transceiver **3506** connects to the meeting point.

A second transmission of information **3528** from the first sub-device **3510** may be transmitted on the second communication channel **3524** identified by the first sub-identifier **3512**, the second transmission of information **3528** following the first transmission of information **3526** and being relayed by the server **3540** to the second sub-device **3516**.

A third transmission of information **3530** may be transmitted from the second sub-device **3516** on the third communication channel **3534** identified by the second sub-identifier **3518**. The third transmission of information **3530** following the first transmission of information **3526** and being relayed by the server **3540** to the first sub-device **3510**.

The packets may be redirected at the server **3540** by changing a sending address of each packet header from an address of the meeting point to an address of the second transceiver **3506**.

If the second transceiver **3506** declines the first transmission, the second transceiver **3506** sends a decline message to the server **3540** and the server **3540** relays the decline message to the first transceiver **3502**.

If the second transceiver **3506** suggests an alternative meeting point in response to the first transmission, the second transceiver **3506** connects to the alternative meeting point.

In another embodiment, as shown in FIG. **36**, a method of communication **3600** may start by applying a first identifier to a first transceiver, as shown in operation **3602**.

The method of communication may continue by applying a second identifier to a second transceiver, as shown in operation **3604**.

The method of communication may continue by applying a third identifier to a server, as shown in operation **3606**.

The method of communication may continue by providing a first sub-device may have a first sub-identifier comprised of the first identifier and a first device code, as shown in operation **3608**.

The method of communication may continue by providing a second sub-device may have a second sub-identifier comprised of the second identifier and a second device code, as shown in operation **3610**.

The method of communication may continue by providing a first communication channel between the first sub-device and the second sub-device, as shown in operation **3612**.

The method of communication may continue by providing a second communication channel between the first sub-device and the server, the second communication channel not concurrent with the first communication channel, as shown in operation **3614**.

The method of communication may continue by providing a third communication channel between the second sub-device and the server, the third communication channel **3634** not concurrent with the first communication channel, as shown in operation **3616**.

The method of communication may continue by transmitting first information from the first sub-device on the first communication channel identified by the first sub-identifier, as shown in operation **3618**.

The method of communication may continue by transmitting second information from the first sub-device on the second communication channel identified by the first sub-identifier, the second transmission of information following the first transmission of information, as shown in operation **3620**.

The method of communication may continue by relaying the second transmission of information to the second sub-device by the server, as shown in operation **3622**.

The method may continue by transmitting third information from the second sub-device on the third communication channel identified by the second sub-identifier, the third transmission of information following the first transmission of information, as shown in operation **3624**.

The method of communication may continue by relaying the third transmission of information to the first sub-device by the server, as shown in operation **3626**.

The foregoing has described the principles, embodiments, and modes of operation of the present invention. However, the invention should not be construed as being limited to the particular embodiments described above, as they should be regarded as being illustrative and not restrictive. It should be appreciated that variations may be made in those embodiments by those skilled in the art without departing from the scope of the present invention.

While a preferred embodiment of the present invention has been described above, it should be understood that it has been presented by way of example only, and not limitation. Thus, the breadth and scope of the present invention should not be limited by the above described exemplary embodiment.

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that the invention may be practiced otherwise than as specifically described herein.

The many features and advantages of the invention are apparent from the detailed specification and, thus, it is intended by the appended claims to cover all such features and advantages of the embodiments that fall within the true spirit and scope thereof. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the inventive embodiments to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope thereof.

What is claimed is:

**1**. A communication system, comprising:

a first transceiver having a first identifier;

a second transceiver having a second identifier;

a first sub-device having a first sub-identifier comprised of the first identifier and a first device code;

a second sub-device having a second sub-identifier comprised of the second identifier and a second device code;

a first communication channel between the first sub-device and the second sub-device;

a second communication channel between the first sub-device and the second transceiver;

a first transmission of information from the first sub-device on the first communication channel identified by the first sub-identifier;

a second transmission of information from the second sub-device on the first communication channel identified by the second sub-identifier;

a third transmission of information from the first sub-device on the second communication channel identified by the first identifier; and

a fourth transmission of information from the second transceiver on the second communication channel identified by the second identifier,

wherein the first sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the first transceiver, and the first identifier, and

wherein the second sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the second transceiver, and the second identifier.

**2**. The communication system of claim **1**, wherein the first identifier is selected from the group consisting of:

an identification number of the first transceiver;

a phone identifier,

a series of digits;

a GSM identifier;

an International Dialing Convention identifier,

a mobile phone identifier, and

a land-line telephone identifier.

**3**. The communication system of claim **1**, wherein the second identifier is selected from the group consisting of:

an identification number of the second transceiver;

a phone identifier,

a series of digits;

a GSM identifier;

an International Dialing Convention identifier,

a mobile phone identifier, and

a land-line telephone identifier.

**4**. The communication system of claim **1**, wherein the artificial device code and the sub-device identifier are removed to call an outside line.

**5**. The communication system of claim **1**, wherein the first transceiver is a handset, a phone, a gateway, a base station, a server, a cell tower, a transceiver, a computer, a palm top, a laptop, a tablet, or a personal digital assistant.

**6**. The communication system of claim **1**, wherein the second transceiver is a handset, a phone, a gateway, a base station, a server, a cell tower, a transceiver, a computer, a palm top, a laptop, a tablet, or a personal digital assistant.

**7**. A method of communication, comprising:

applying a first identifier to a first transceiver;

applying a second identifier to a second transceiver;

applying a first sub-identifier to a first sub-device comprised of the first identifier and a first device code;

applying a second sub-identifier to a second sub-device comprised of the second identifier and a second device code;

providing a first communication channel between the first sub-device and the second sub-device;

providing a second communication channel between the first sub-device and the second transceiver;

transmitting first information from the first sub-device on the first communication channel identified by the first sub-identifier;

transmitting second information from the second sub-device on the first communication channel identified by the second sub-identifier;

transmitting third information from the first sub-device on the second communication channel identified by the first identifier; and

transmitting fourth information from the second transceiver on the second communication channel identified by the second identifier,

wherein the first sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the first transceiver, and the first identifier, and

wherein the second sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the second transceiver, and the second identifier.

**8**. A communication system, comprising:

a first transceiver having a first identifier;

a second transceiver having a second identifier;

a server having a third identifier;

a first sub-device having a first sub-identifier comprised of the first identifier and a first device code;

a second sub-device having a second sub-identifier comprised of the second identifier and a second device code;

a first communication channel between the first sub-device and the second sub-device;

a second communication channel between the first sub-device and the server, the second communication channel not concurrent with the first communication channel;

a third communication channel between the second sub-device and the server, the third communication channel not concurrent with the first communication channel;

a first transmission of information from the first sub-device on the first communication channel identified by the first sub-identifier;

a second transmission of information from the first sub-device on the second communication channel identified by the first sub-identifier, the second transmission of information following the first transmission of information and being relayed by the server to the second sub-device; and

a third transmission of information from the second sub-device on the third communication channel identified by the second sub-identifier; the third transmission of information following the first transmission of information and being relayed by the server to the first sub-device,

wherein the first sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the first transceiver, and the first identifier, and

wherein the second sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the second transceiver, and the second identifier.

**9**. The communication system of claim **8**, wherein the server is a computer, a base station, a handset, a Voice over Internet Protocol handset, a Voice over Internet Protocol controller, a switch box, or a dedicated black box device and peripherals.

**10**. The communication system of claim **8**, wherein an address of a meeting point on the server comprises an identification identifier of the second transceiver and an Internet Protocol address or a Domain Name System name of the server.

**11**. The communication system of claim **8**, wherein the second communication channel comprises packets formatted with a format selected from the group consisting of:

Voice over Internet Protocol,

Internet Protocol, and

User Datagram Protocol.

**12**. The communication system of claim **8**, wherein the third communication channel comprises packets formatted with a format selected from the group consisting of:

Voice over Internet Protocol,

Internet Protocol, and

User Datagram Protocol.

**13**. The communication system of claim **10**, wherein if the second transceiver accepts the first transmission, the second transceiver connects to the meeting point.

**14**. The communication system of claim **10**, wherein if the second transceiver declines the first transmission, the second transceiver sends a decline message to the server and the server relays the decline message to the first transceiver.

**15**. The communication system of claim **10**, wherein if the second transceiver suggests an alternative meeting point, the second transceiver connects to the alternative meeting point.

**16**. The communication system of claim **11**, wherein the packets are redirected at the server by changing a sending address of each packet header from an address of the meeting point to an address of the second transceiver.

**17**. The communication system of claim **12**, wherein the packets are redirected at the server by changing a sending address of each packet header from an address of the meeting point to an address of the second transceiver.

**18**. A method of communication, comprising:

applying a first identifier to a first transceiver;

applying a second identifier to a second transceiver;

applying a third identifier to a server;

providing a first sub-device having a first sub-identifier comprised of the first identifier and a first device code;

providing a second sub-device having a second sub-identifier comprised of the second identifier and a second device code;

providing a first communication channel between the first sub-device and the second sub-device;

providing a second communication channel between the first sub-device and the server, the second communication channel not concurrent with the first communication channel;

providing a third communication channel between the second sub-device and the server, the third communication channel not concurrent with the first communication channel;

transmitting first information from the first sub-device on the first communication channel identified by the first sub-identifier;

transmitting second information from the first sub-device on the second communication channel identified by the first sub-identifier, the second transmission of information following the first transmission of information;

relaying the second transmission of information to the second sub-device by the server; transmitting third information from the second sub-device on the third communication channel identified by the second sub-identifier, the third transmission of information following the first transmission of information; and

relaying the third transmission of information to the first sub-device by the server,

wherein the first sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the first transceiver, and the first identifier, and

wherein the second sub-identifier is comprised of an artificial device code, a sub-device identifier assigned to the second transceiver, and the second identifier.

* * * * *