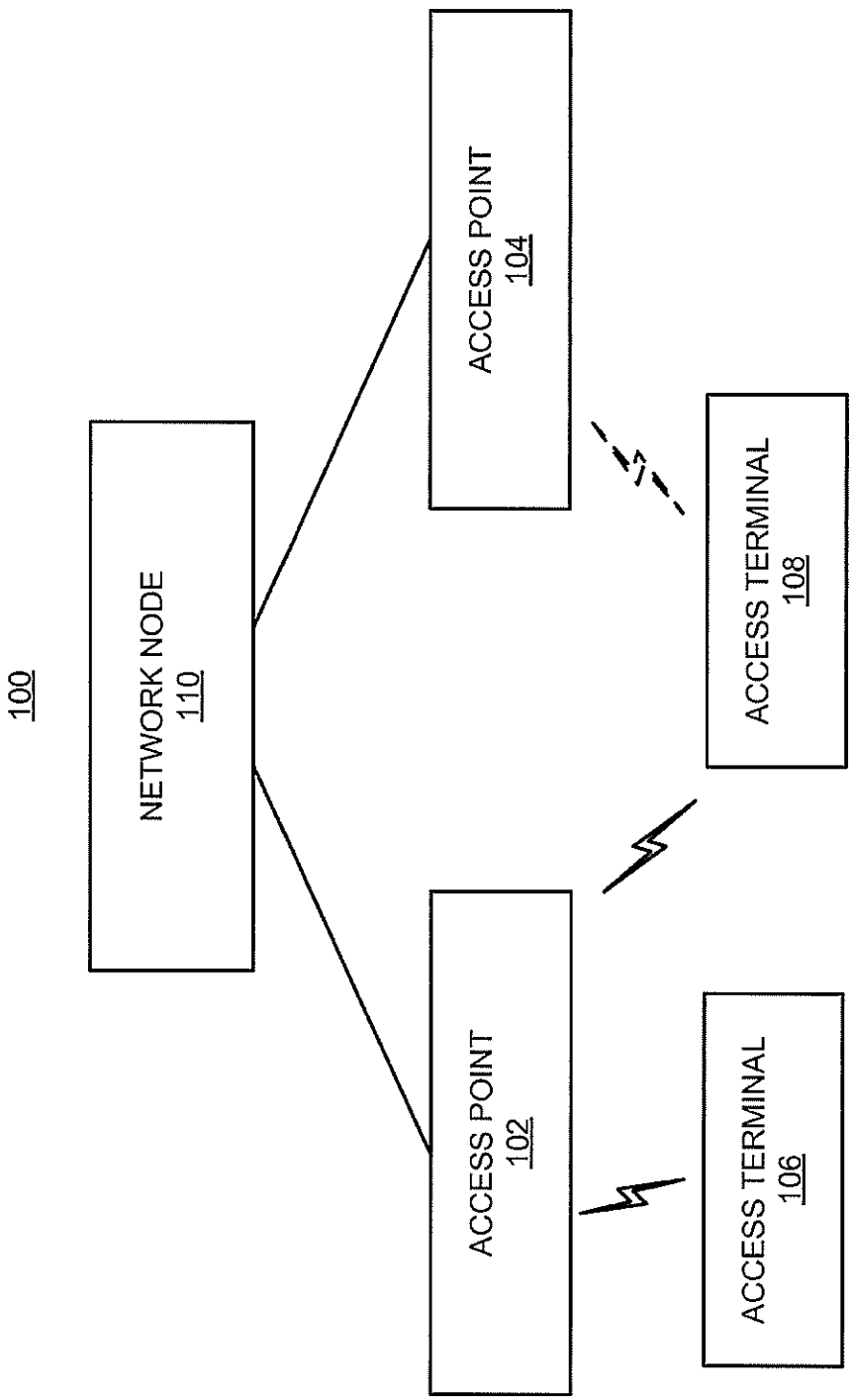
100
NETWORK NODE
110
ACCESS POINT
104
ACCESS POINT
102
ACCESS TERMINAL
108
ACCESS TERMINAL
106

FIG. 1

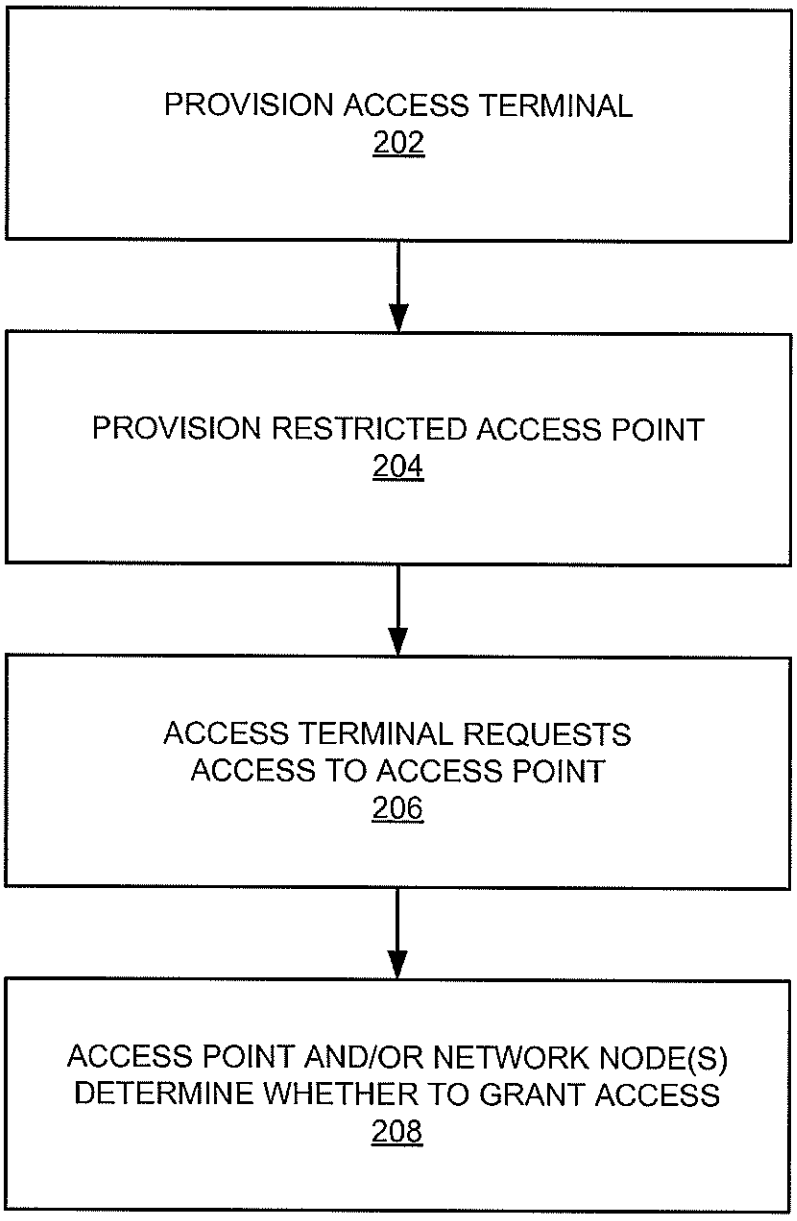
PROVISION ACCESS TERMINAL
202
PROVISION RESTRICTED ACCESS POINT
204
ACCESS TERMINAL REQUESTS
ACCESS TO ACCESS POINT
206
ACCESS POINT AND/OR NETWORK NODE(S)
DETERMINE WHETHER TO GRANT ACCESS
208

FIG. 2

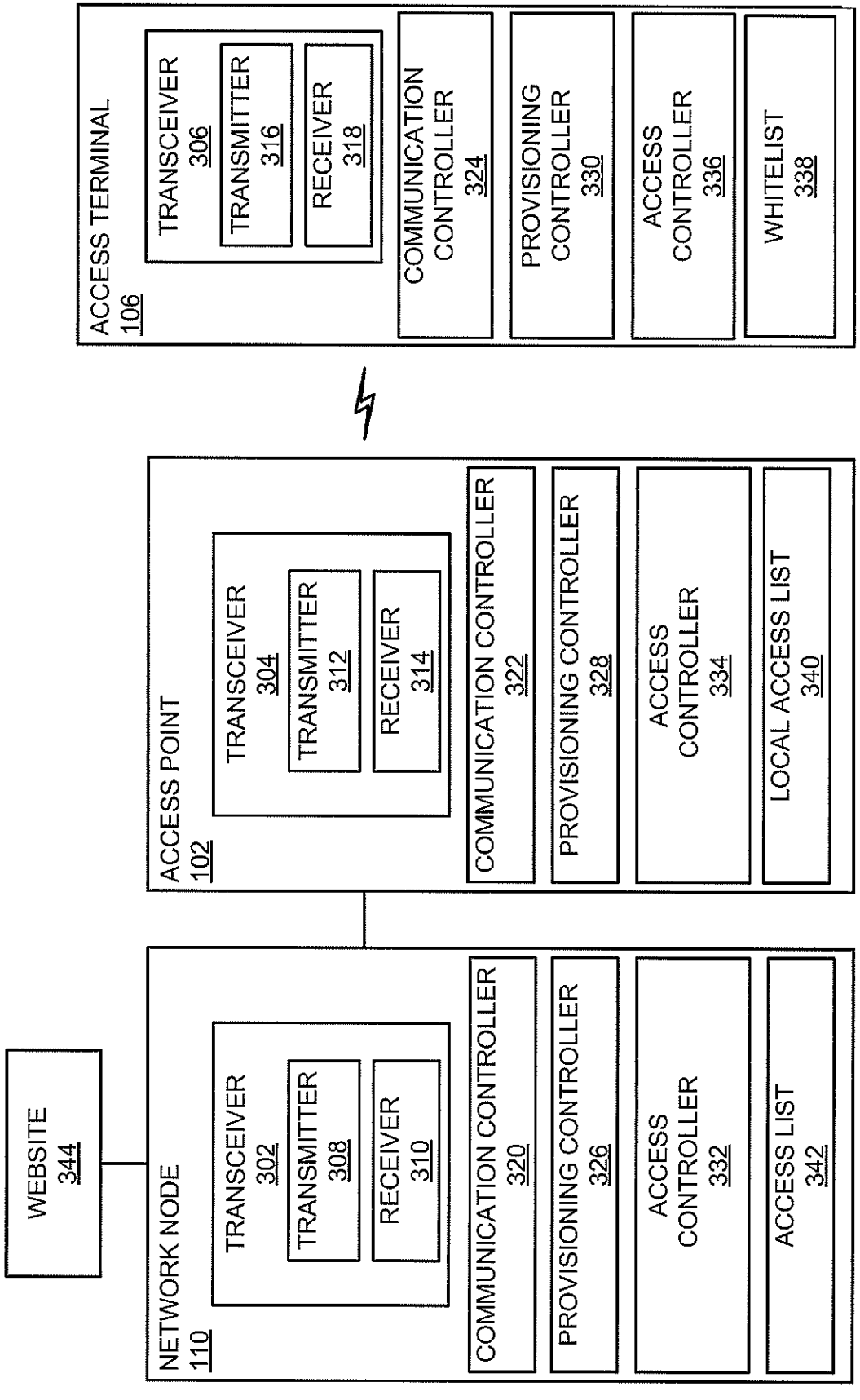
300
WEBSITE
344
NETWORK NODE
110
TRANSCEIVER
302
TRANSMITTER
308
RECEIVER
310
COMMUNICATION CONTROLLER
320
PROVISIONING CONTROLLER
326
ACCESS CONTROLLER
332
ACCESS LIST
342
ACCESS POINT
102
TRANSCEIVER
304
TRANSMITTER
312
RECEIVER
314
COMMUNICATION CONTROLLER
322
PROVISIONING CONTROLLER
328
ACCESS CONTROLLER
334
LOCAL ACCESS LIST
340
ACCESS TERMINAL
106
TRANSCEIVER
306
TRANSMITTER
316
RECEIVER
318
COMMUNICATION CONTROLLER
324
PROVISIONING CONTROLLER
330
ACCESS CONTROLLER
336
WHITELIST
338

FIG. 3

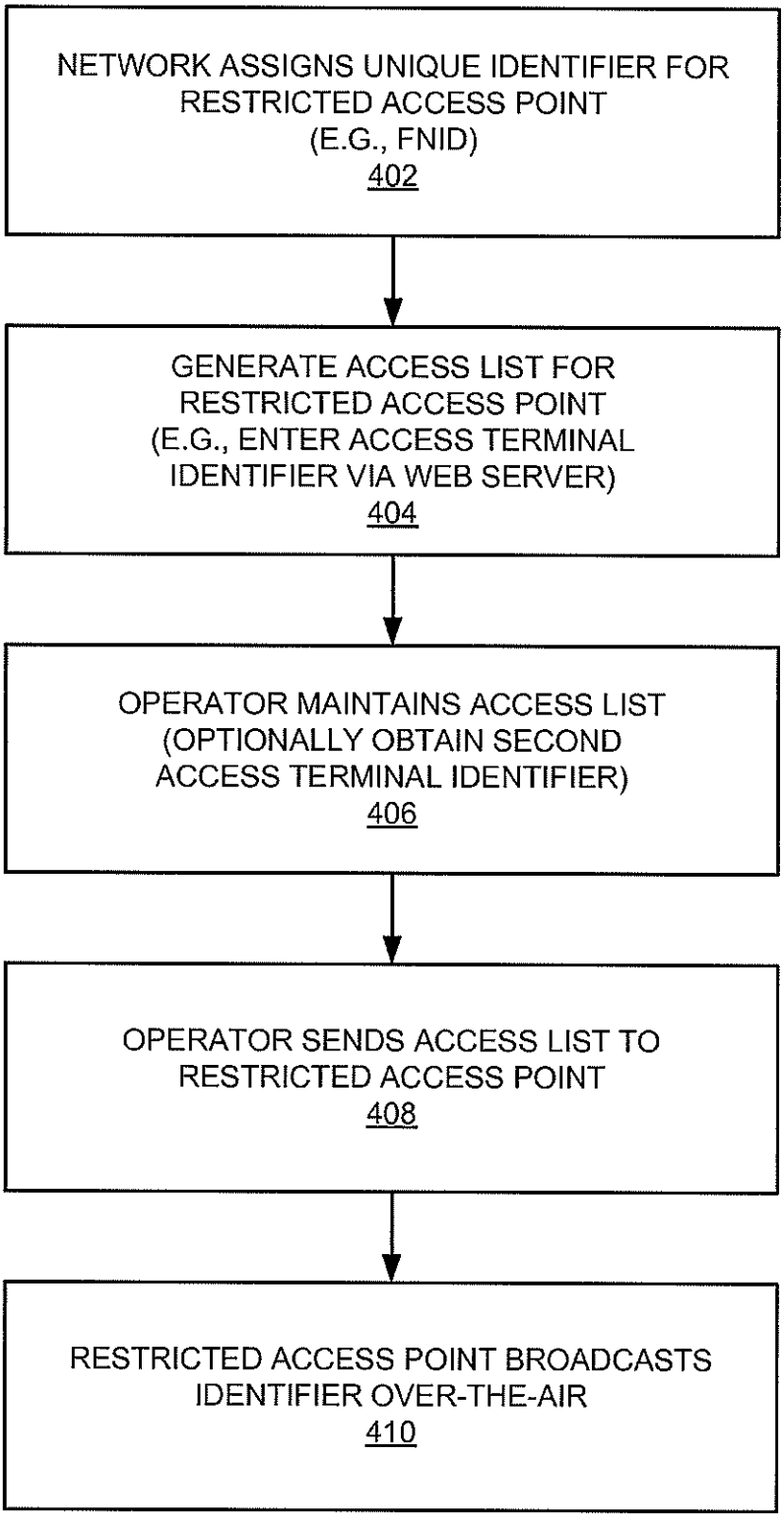
NETWORK ASSIGNS UNIQUE IDENTIFIER FOR RESTRICTED ACCESS POINT (E.G., FNID)
402
GENERATE ACCESS LIST FOR RESTRICTED ACCESS POINT (E.G., ENTER ACCESS TERMINAL IDENTIFIER VIA WEB SERVER)
404
OPERATOR MAINTAINS ACCESS LIST (OPTIONALLY OBTAIN SECOND ACCESS TERMINAL IDENTIFIER)
406
OPERATOR SENDS ACCESS LIST TO RESTRICTED ACCESS POINT
408
RESTRICTED ACCESS POINT BROADCASTS IDENTIFIER OVER-THE-AIR
410

FIG. 4

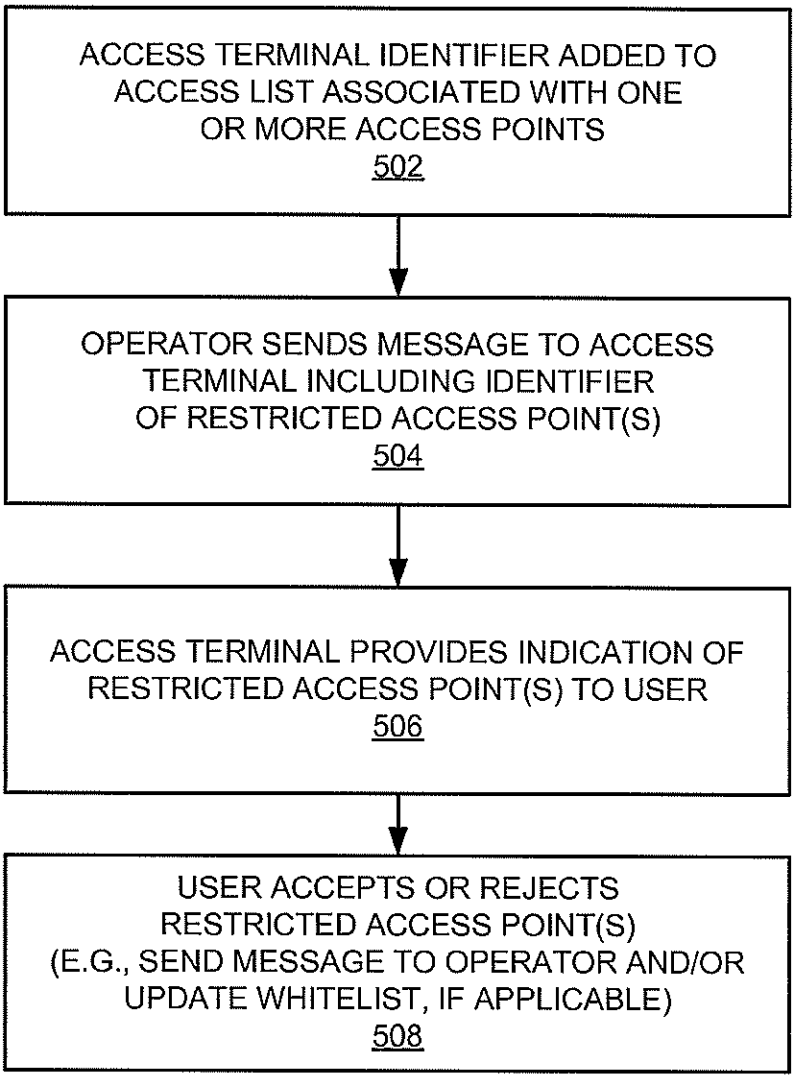
ACCESS TERMINAL IDENTIFIER ADDED TO ACCESS LIST ASSOCIATED WITH ONE OR MORE ACCESS POINTS
502
OPERATOR SENDS MESSAGE TO ACCESS TERMINAL INCLUDING IDENTIFIER OF RESTRICTED ACCESS POINT(S)
504
ACCESS TERMINAL PROVIDES INDICATION OF RESTRICTED ACCESS POINT(S) TO USER
506
USER ACCEPTS OR REJECTS RESTRICTED ACCESS POINT(S) (E.G., SEND MESSAGE TO OPERATOR AND/OR UPDATE WHITELIST, IF APPLICABLE)
508

FIG. 5

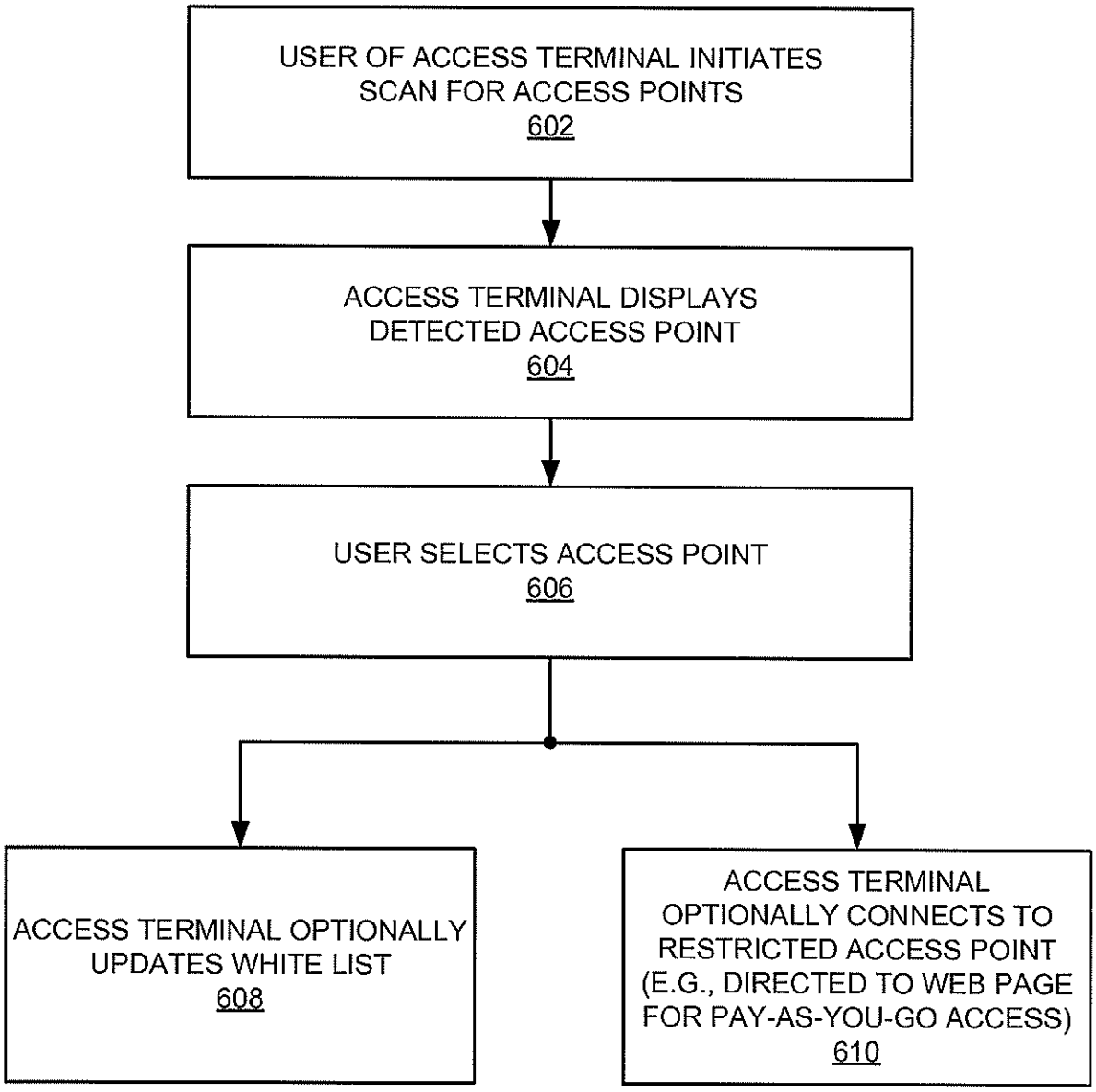
USER OF ACCESS TERMINAL INITIATES SCAN FOR ACCESS POINTS
602
ACCESS TERMINAL DISPLAYS DETECTED ACCESS POINT
604
USER SELECTS ACCESS POINT
606
ACCESS TERMINAL OPTIONALLY UPDATES WHITE LIST
608
ACCESS TERMINAL OPTIONALLY CONNECTS TO RESTRICTED ACCESS POINT (E.G., DIRECTED TO WEB PAGE FOR PAY-AS-YOU-GO ACCESS)
610

FIG. 6

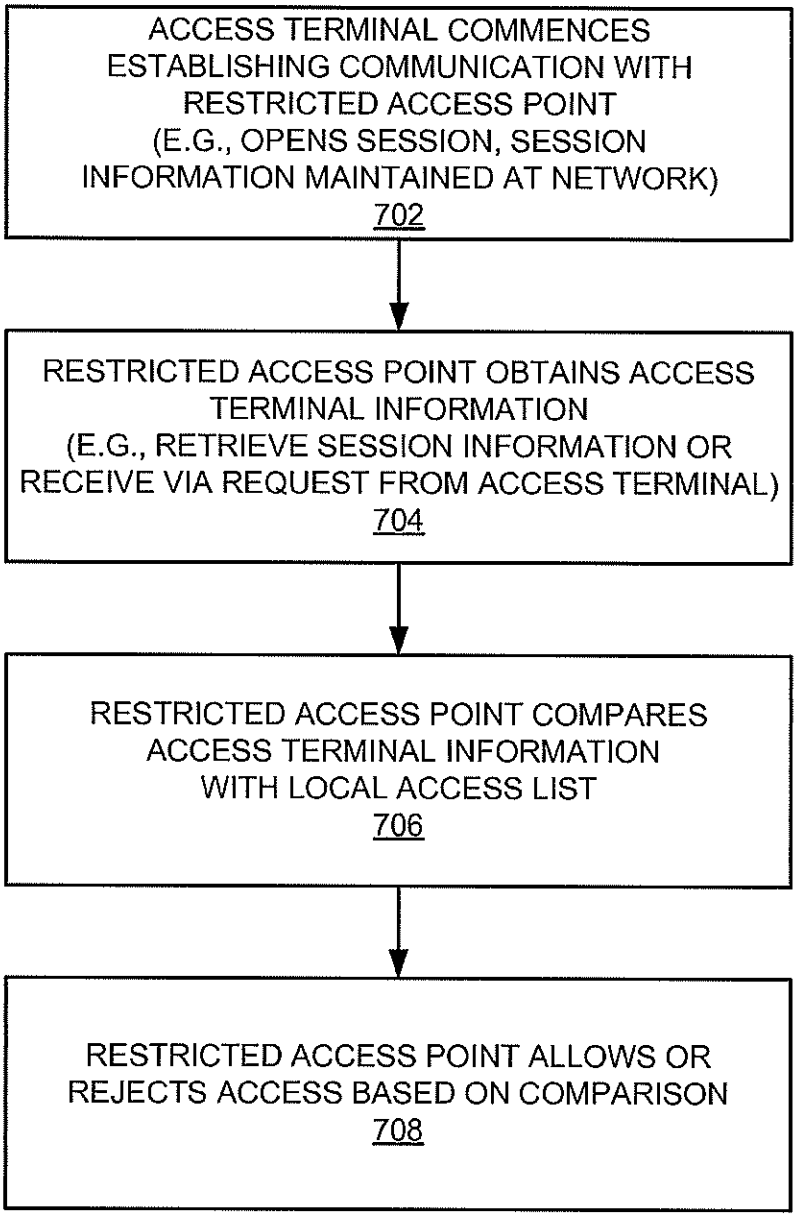
ACCESS TERMINAL COMMENCES ESTABLISHING COMMUNICATION WITH RESTRICTED ACCESS POINT (E.G., OPENS SESSION, SESSION INFORMATION MAINTAINED AT NETWORK)
702
RESTRICTED ACCESS POINT OBTAINS ACCESS TERMINAL INFORMATION (E.G., RETRIEVE SESSION INFORMATION OR RECEIVE VIA REQUEST FROM ACCESS TERMINAL)
704
RESTRICTED ACCESS POINT COMPARES ACCESS TERMINAL INFORMATION WITH LOCAL ACCESS LIST
706
RESTRICTED ACCESS POINT ALLOWS OR REJECTS ACCESS BASED ON COMPARISON
708

FIG. 7

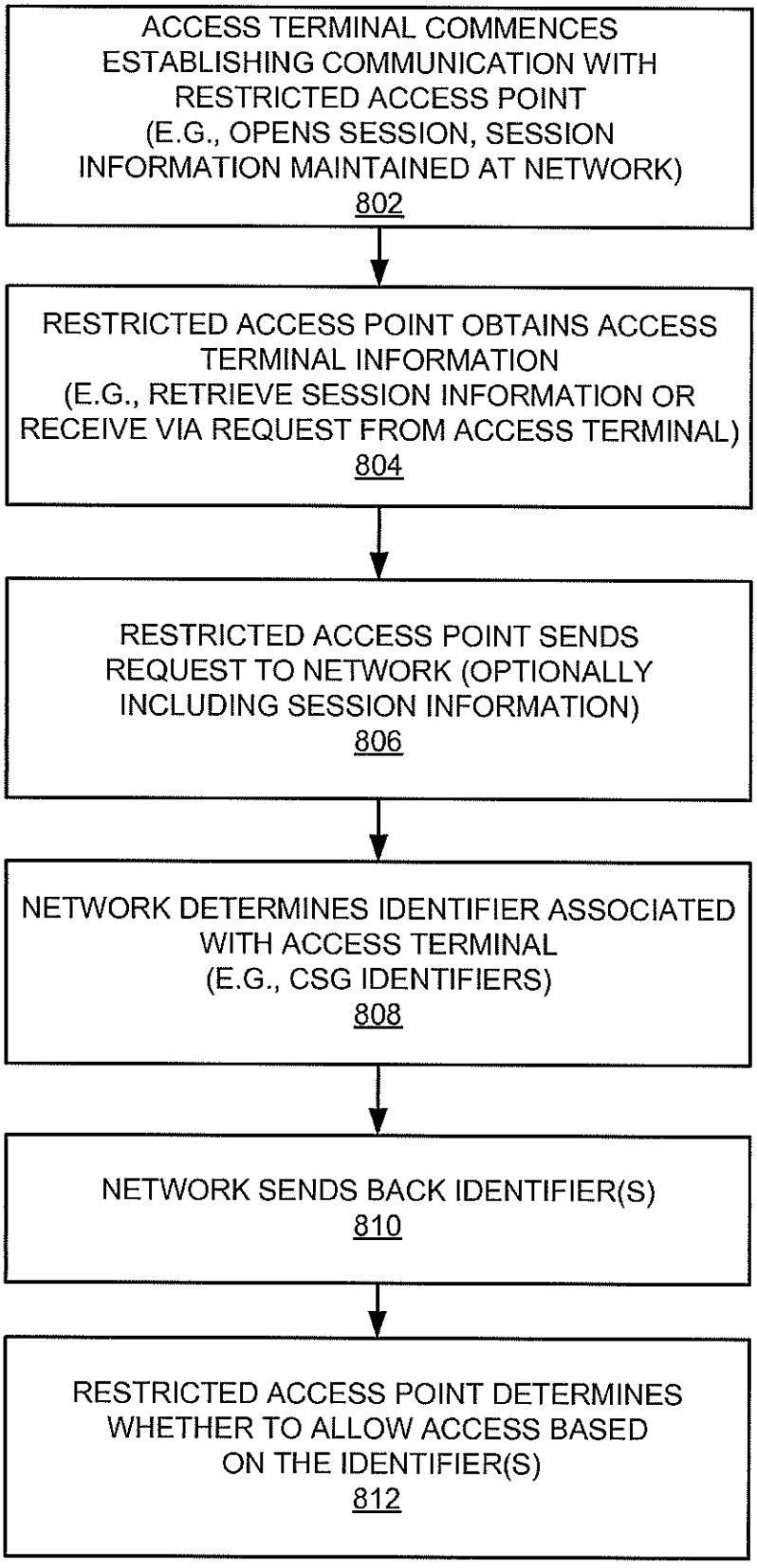
ACCESS TERMINAL COMMENCES ESTABLISHING COMMUNICATION WITH RESTRICTED ACCESS POINT (E.G., OPENS SESSION, SESSION INFORMATION MAINTAINED AT NETWORK)
802
RESTRICTED ACCESS POINT OBTAINS ACCESS TERMINAL INFORMATION (E.G., RETRIEVE SESSION INFORMATION OR RECEIVE VIA REQUEST FROM ACCESS TERMINAL)
804
RESTRICTED ACCESS POINT SENDS REQUEST TO NETWORK (OPTIONALLY INCLUDING SESSION INFORMATION)
806
NETWORK DETERMINES IDENTIFIER ASSOCIATED WITH ACCESS TERMINAL (E.G., CSG IDENTIFIERS)
808
NETWORK SENDS BACK IDENTIFIER(S)
810
RESTRICTED ACCESS POINT DETERMINES WHETHER TO ALLOW ACCESS BASED ON THE IDENTIFIER(S)
812

FIG. 8

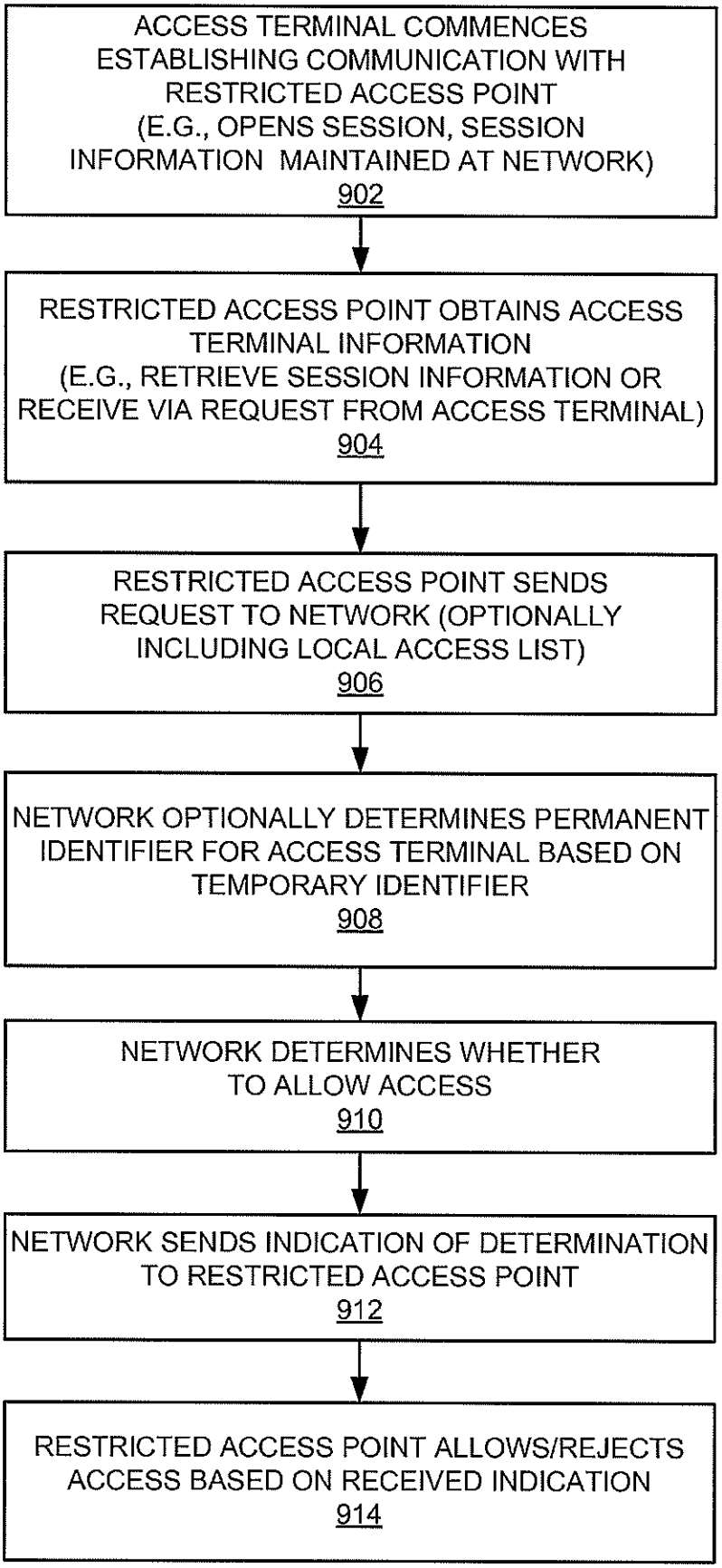
ACCESS TERMINAL COMMENCES ESTABLISHING COMMUNICATION WITH RESTRICTED ACCESS POINT (E.G., OPENS SESSION, SESSION INFORMATION MAINTAINED AT NETWORK)
902
RESTRICTED ACCESS POINT OBTAINS ACCESS TERMINAL INFORMATION (E.G., RETRIEVE SESSION INFORMATION OR RECEIVE VIA REQUEST FROM ACCESS TERMINAL)
904
RESTRICTED ACCESS POINT SENDS REQUEST TO NETWORK (OPTIONALLY INCLUDING LOCAL ACCESS LIST)
906
NETWORK OPTIONALLY DETERMINES PERMANENT IDENTIFIER FOR ACCESS TERMINAL BASED ON TEMPORARY IDENTIFIER
908
NETWORK DETERMINES WHETHER TO ALLOW ACCESS
910
NETWORK SENDS INDICATION OF DETERMINATION TO RESTRICTED ACCESS POINT
912
RESTRICTED ACCESS POINT ALLOWS/REJECTS ACCESS BASED ON RECEIVED INDICATION
914

FIG. 9

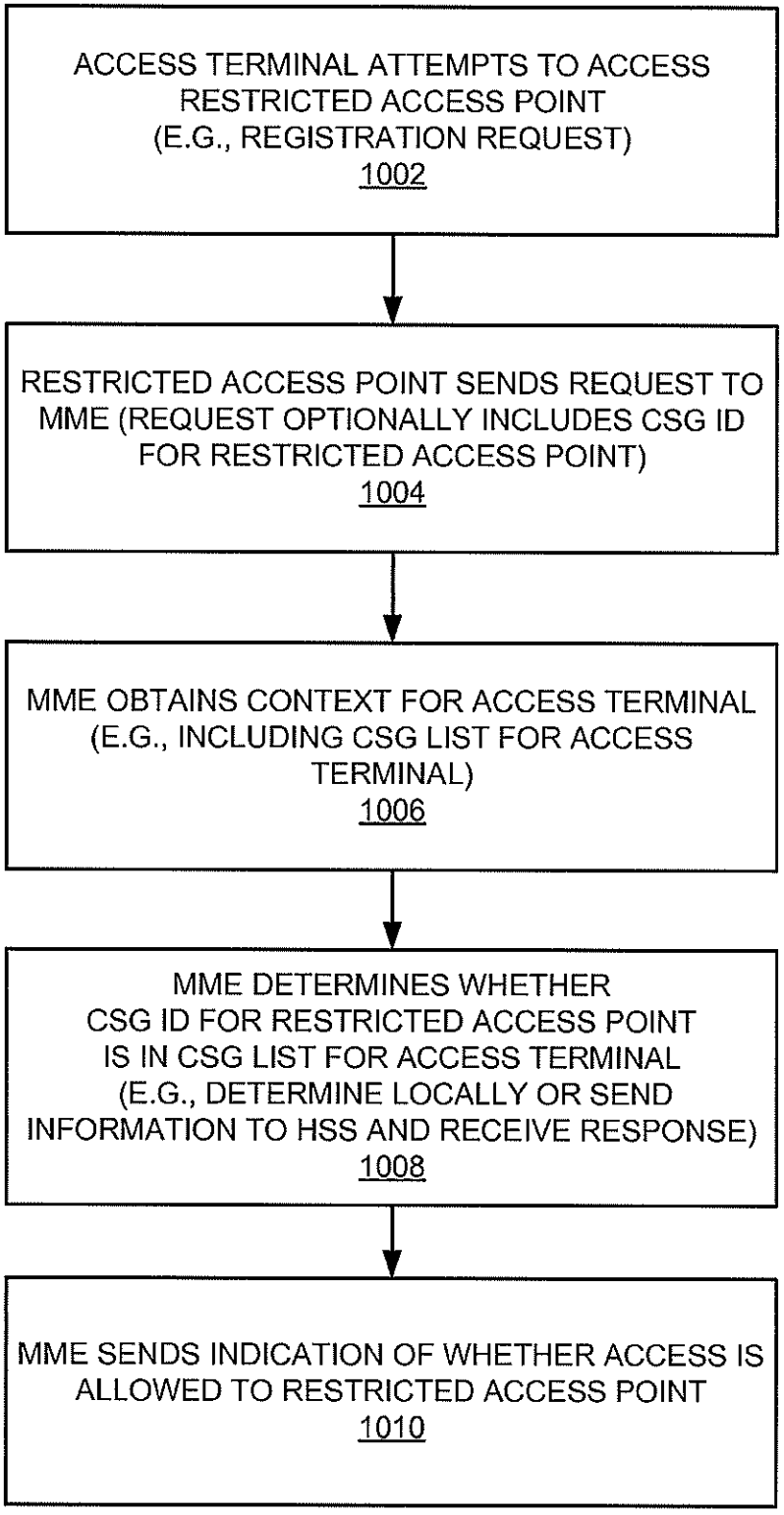
ACCESS TERMINAL ATTEMPTS TO ACCESS RESTRICTED ACCESS POINT (E.G., REGISTRATION REQUEST)
1002
RESTRICTED ACCESS POINT SENDS REQUEST TO MME (REQUEST OPTIONALLY INCLUDES CSG ID FOR RESTRICTED ACCESS POINT)
1004
MME OBTAINS CONTEXT FOR ACCESS TERMINAL (E.G., INCLUDING CSG LIST FOR ACCESS TERMINAL)
1006
MME DETERMINES WHETHER CSG ID FOR RESTRICTED ACCESS POINT IS IN CSG LIST FOR ACCESS TERMINAL (E.G., DETERMINE LOCALLY OR SEND INFORMATION TO HSS AND RECEIVE RESPONSE)
1008
MME SENDS INDICATION OF WHETHER ACCESS IS ALLOWED TO RESTRICTED ACCESS POINT
1010

FIG. 10

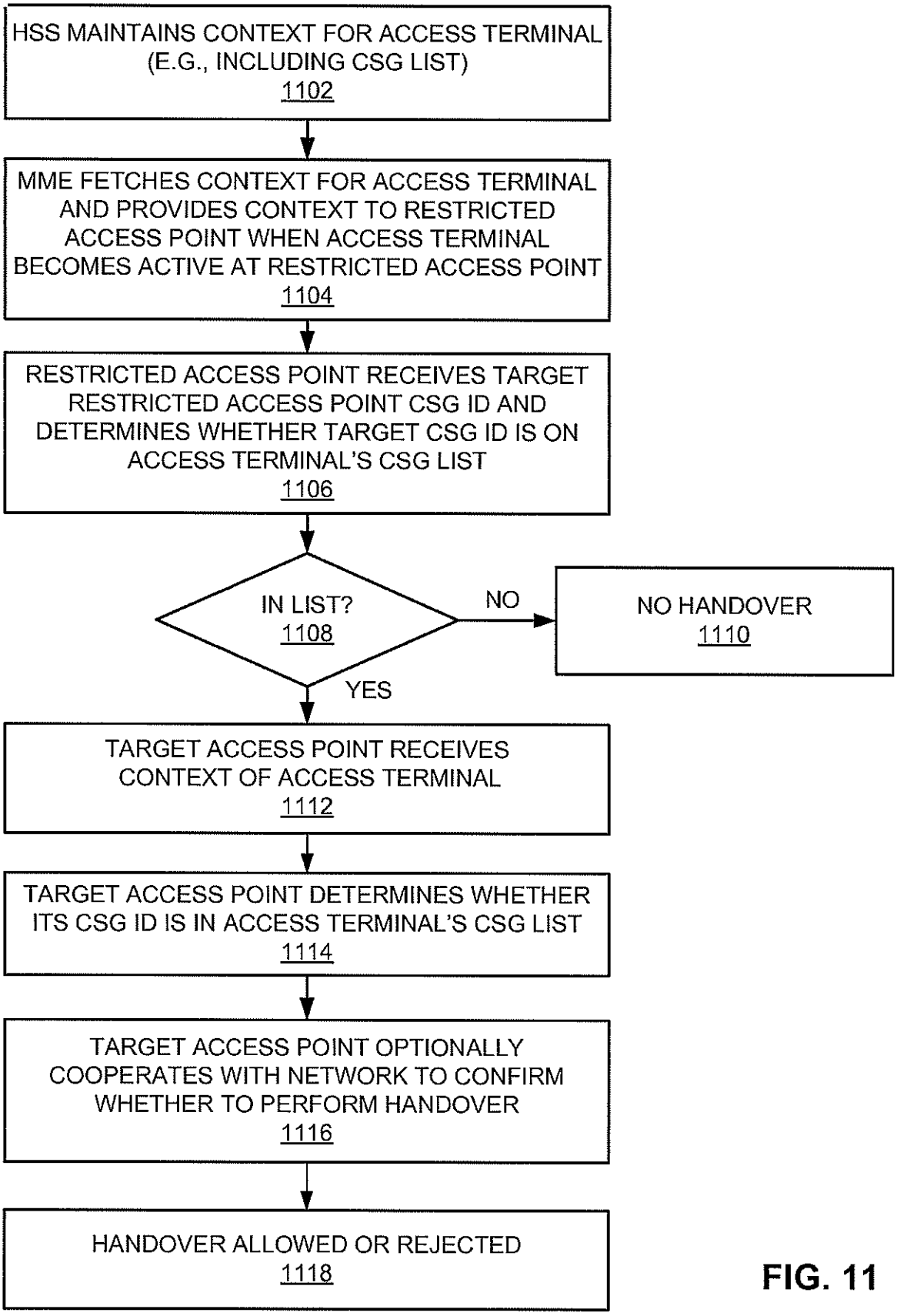
HSS MAINTAINS CONTEXT FOR ACCESS TERMINAL (E.G., INCLUDING CSG LIST)
1102
MME FETCHES CONTEXT FOR ACCESS TERMINAL AND PROVIDES CONTEXT TO RESTRICTED ACCESS POINT WHEN ACCESS TERMINAL BECOMES ACTIVE AT RESTRICTED ACCESS POINT
1104
RESTRICTED ACCESS POINT RECEIVES TARGET RESTRICTED ACCESS POINT CSG ID AND DETERMINES WHETHER TARGET CSG ID IS ON ACCESS TERMINAL'S CSG LIST
1106
IN LIST?
1108
NO
NO HANDOVER
1110
YES
TARGET ACCESS POINT RECEIVES CONTEXT OF ACCESS TERMINAL
1112
TARGET ACCESS POINT DETERMINES WHETHER ITS CSG ID IS IN ACCESS TERMINAL'S CSG LIST
1114
TARGET ACCESS POINT OPTIONALLY COOPERATES WITH NETWORK TO CONFIRM WHETHER TO PERFORM HANDOVER
1116
HANDOVER ALLOWED OR REJECTED
1118

FIG. 11

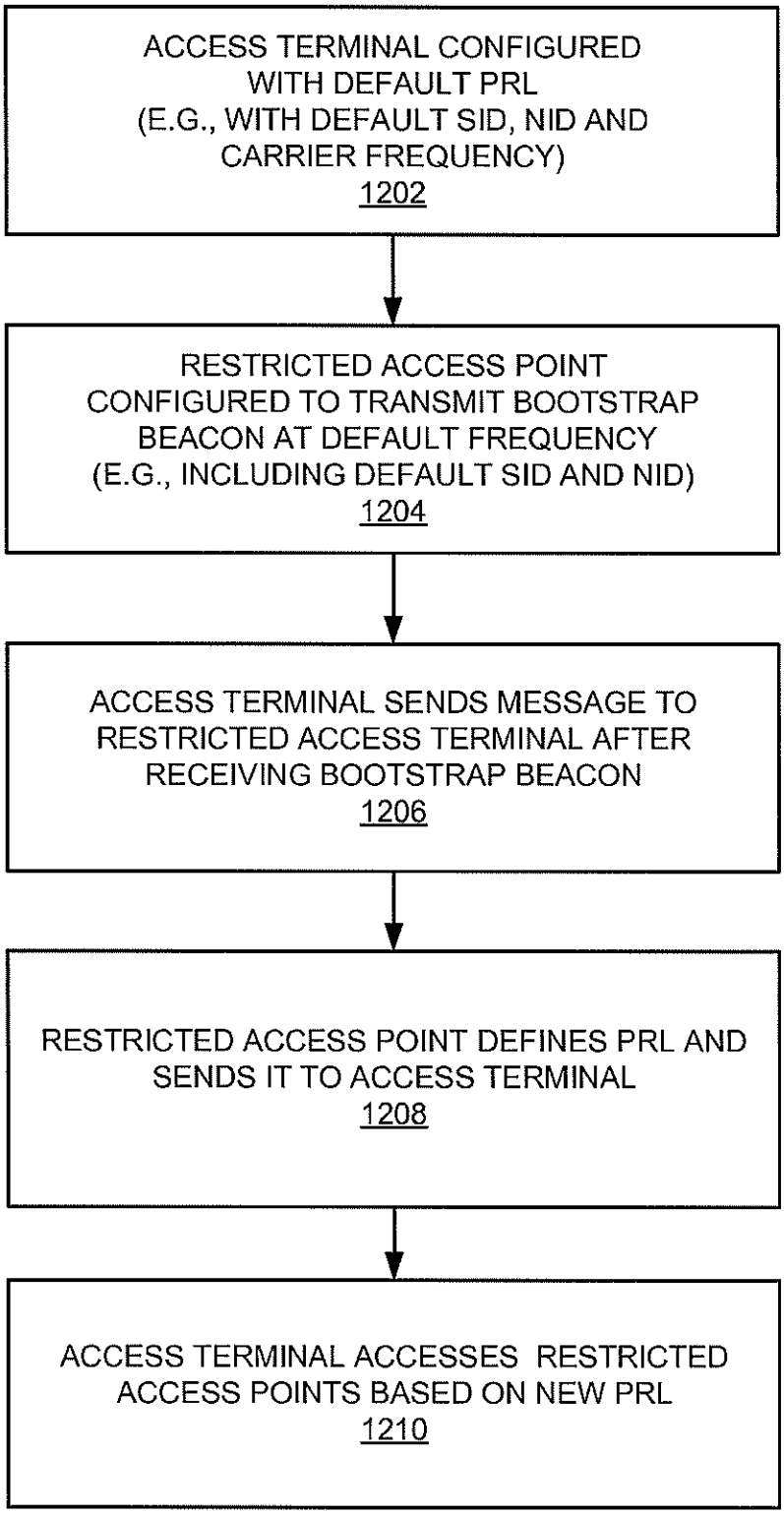
ACCESS TERMINAL CONFIGURED WITH DEFAULT PRL (E.G., WITH DEFAULT SID, NID AND CARRIER FREQUENCY)
1202
RESTRICTED ACCESS POINT CONFIGURED TO TRANSMIT BOOTSTRAP BEACON AT DEFAULT FREQUENCY (E.G., INCLUDING DEFAULT SID AND NID)
1204
ACCESS TERMINAL SENDS MESSAGE TO RESTRICTED ACCESS TERMINAL AFTER RECEIVING BOOTSTRAP BEACON
1206
RESTRICTED ACCESS POINT DEFINES PRL AND SENDS IT TO ACCESS TERMINAL
1208
ACCESS TERMINAL ACCESSES RESTRICTED ACCESS POINTS BASED ON NEW PRL
1210

FIG. 12

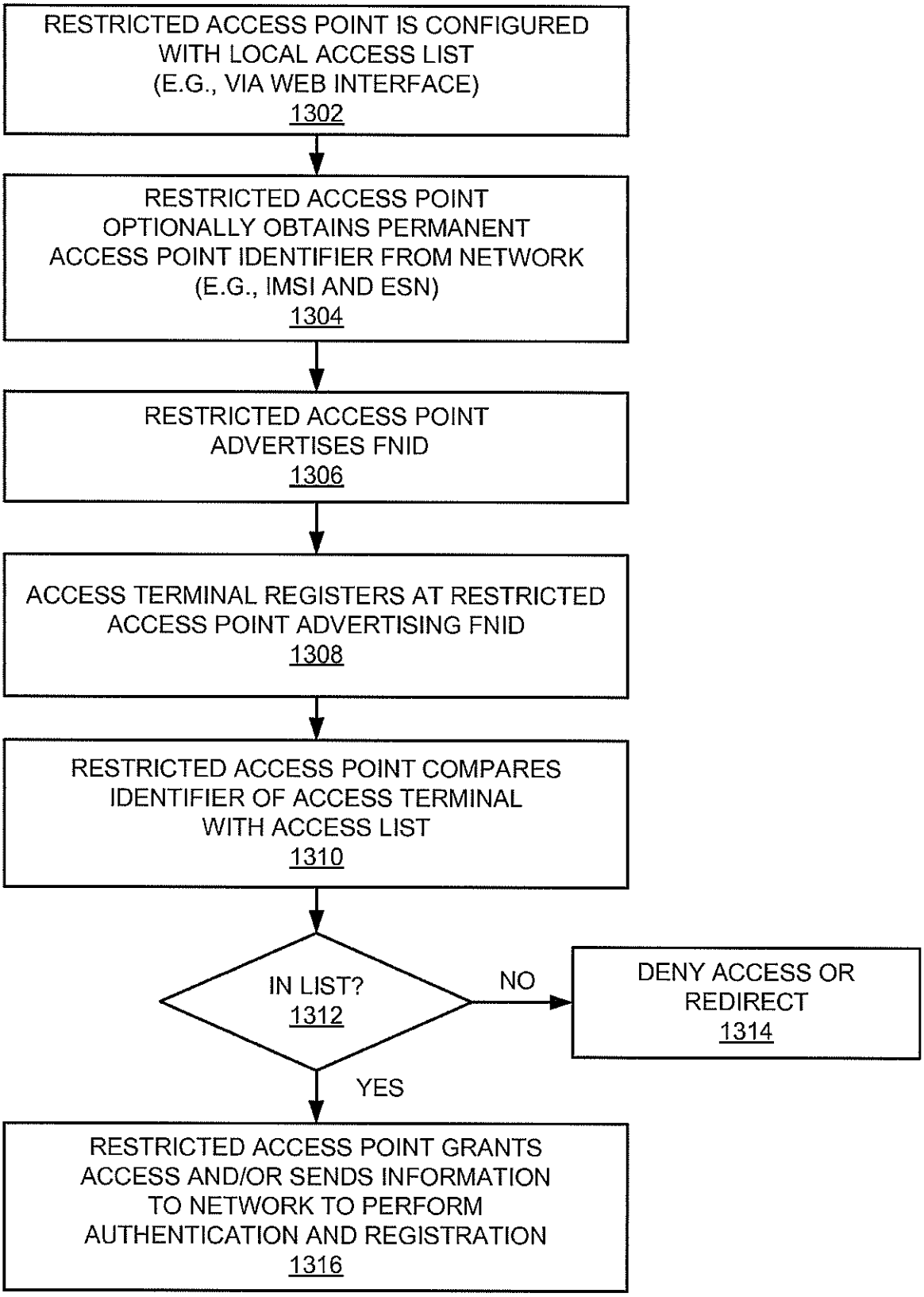
RESTRICTED ACCESS POINT IS CONFIGURED WITH LOCAL ACCESS LIST (E.G., VIA WEB INTERFACE) 1302
RESTRICTED ACCESS POINT OPTIONALLY OBTAINS PERMANENT ACCESS POINT IDENTIFIER FROM NETWORK (E.G., IMSI AND ESN) 1304
RESTRICTED ACCESS POINT ADVERTISES FNID 1306
ACCESS TERMINAL REGISTERS AT RESTRICTED ACCESS POINT ADVERTISING FNID 1308
RESTRICTED ACCESS POINT COMPARES IDENTIFIER OF ACCESS TERMINAL WITH ACCESS LIST 1310
IN LIST? 1312
NO
DENY ACCESS OR REDIRECT 1314
YES
RESTRICTED ACCESS POINT GRANTS ACCESS AND/OR SENDS INFORMATION TO NETWORK TO PERFORM AUTHENTICATION AND REGISTRATION 1316

FIG. 13

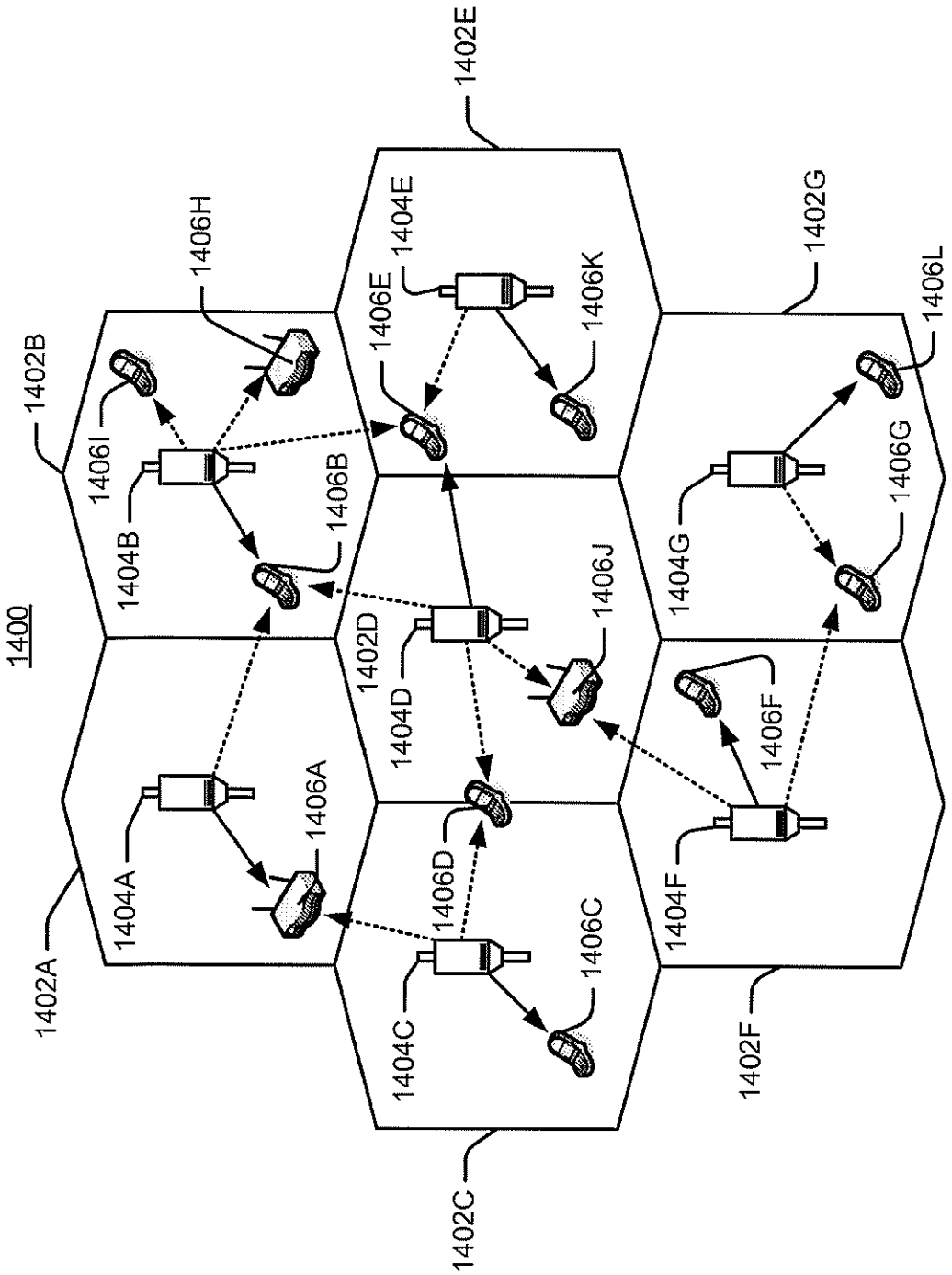
1400
1402A
1402B
1402C
1402D
1402E
1402F
1402G
1404A
1404B
1404C
1404D
1404E
1404F
1404G
1406A
1406B
1406C
1406D
1406E
1406F
1406G
1406H
1406I
1406J
1406K
1406L

FIG. 14

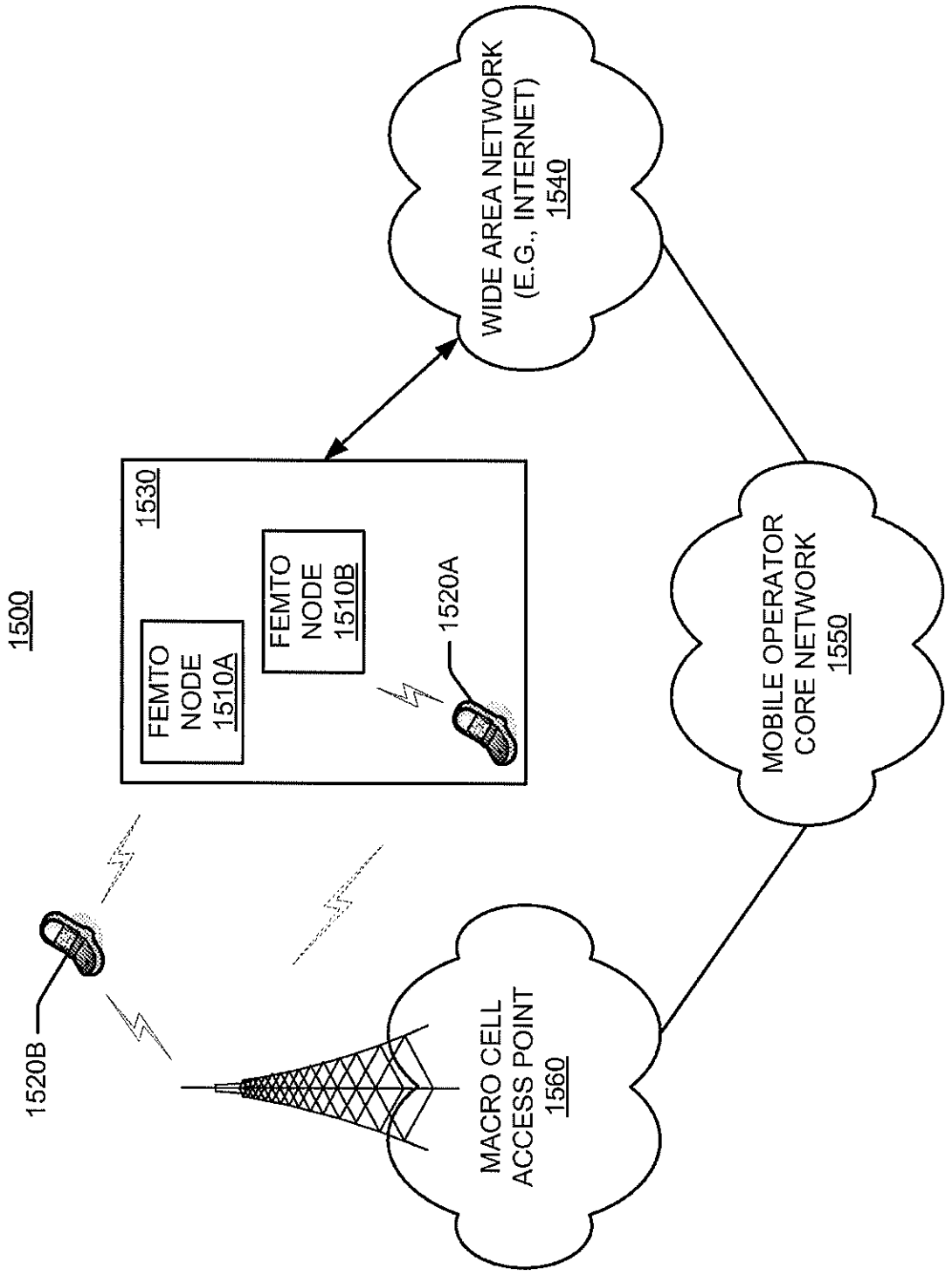
1500
WIDE AREA NETWORK
(E.G., INTERNET)
1540
1530
FEMTO
NODE
1510A
FEMTO
NODE
1510B
1520A
1520B
MOBILE OPERATOR
CORE NETWORK
1550
MACRO CELL
ACCESS POINT
1560

FIG. 15

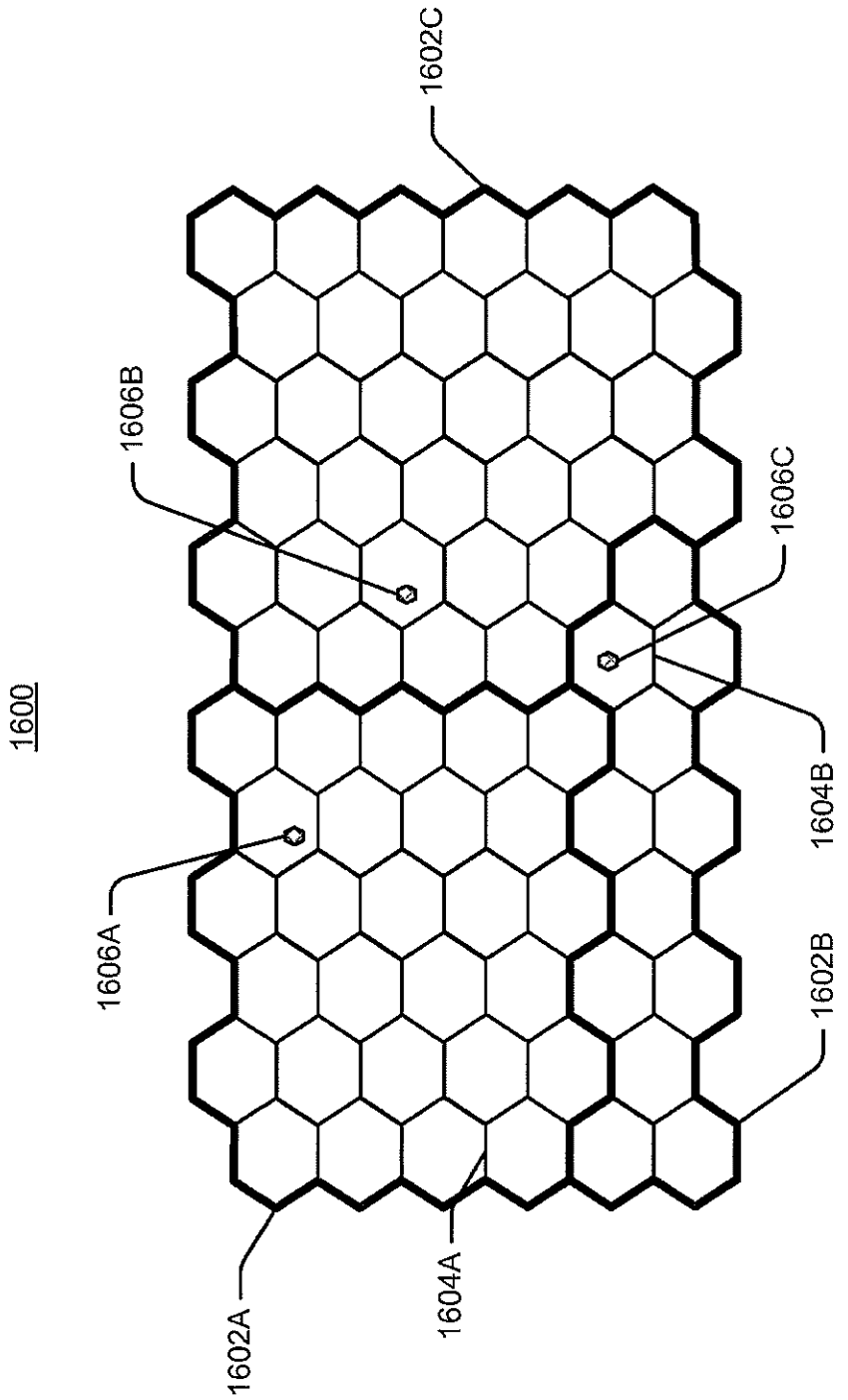

FIG. 16

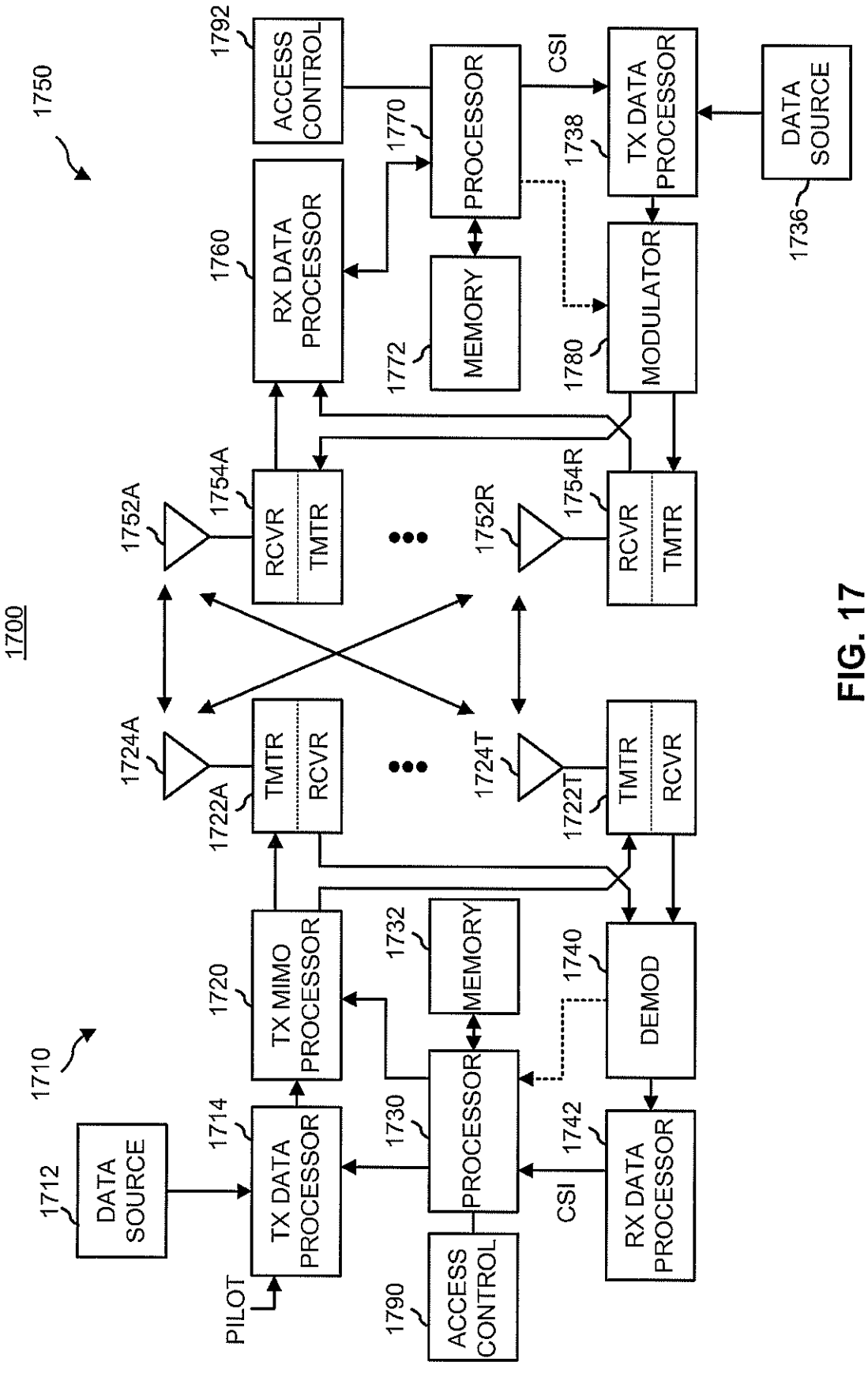
1700
1710
1712
DATA SOURCE
1714
TX DATA PROCESSOR
PILOT
1720
TX MIMO PROCESSOR
1722A
TMTR
RCVR
1724A
1724T
1722T
1730
PROCESSOR
1732
MEMORY
1740
DEMOD
1742
RX DATA PROCESSOR
CSI
1790
ACCESS CONTROL
1750
1752A
1754A
RCVR
TMTR
1752R
1754R
1760
RX DATA PROCESSOR
1770
PROCESSOR
1772
MEMORY
1780
MODULATOR
1738
TX DATA PROCESSOR
CSI
1792
ACCESS CONTROL
1736
DATA SOURCE

FIG. 17

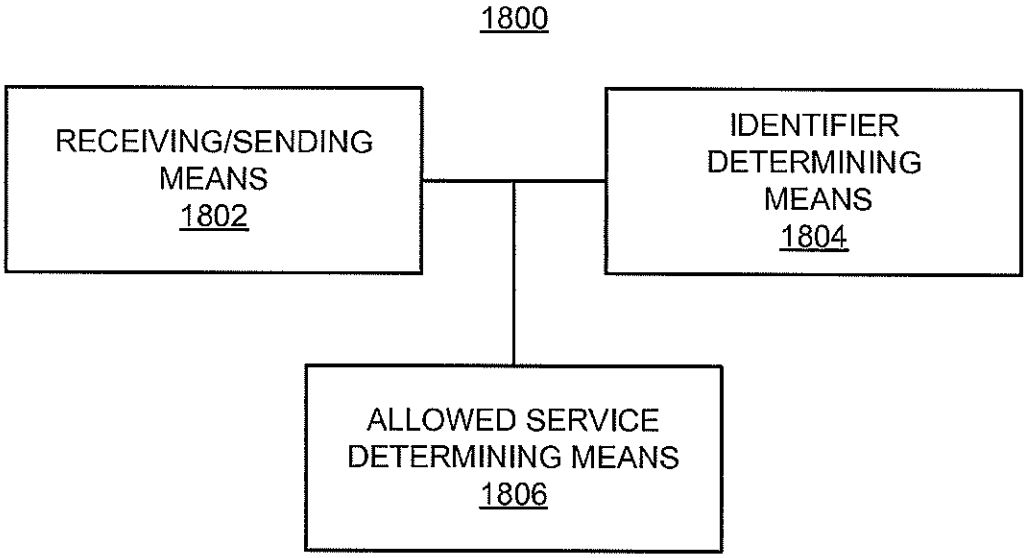
1800
RECEIVING/SENDING MEANS 1802
IDENTIFIER DETERMINING MEANS 1804
ALLOWED SERVICE DETERMINING MEANS 1806

FIG. 18

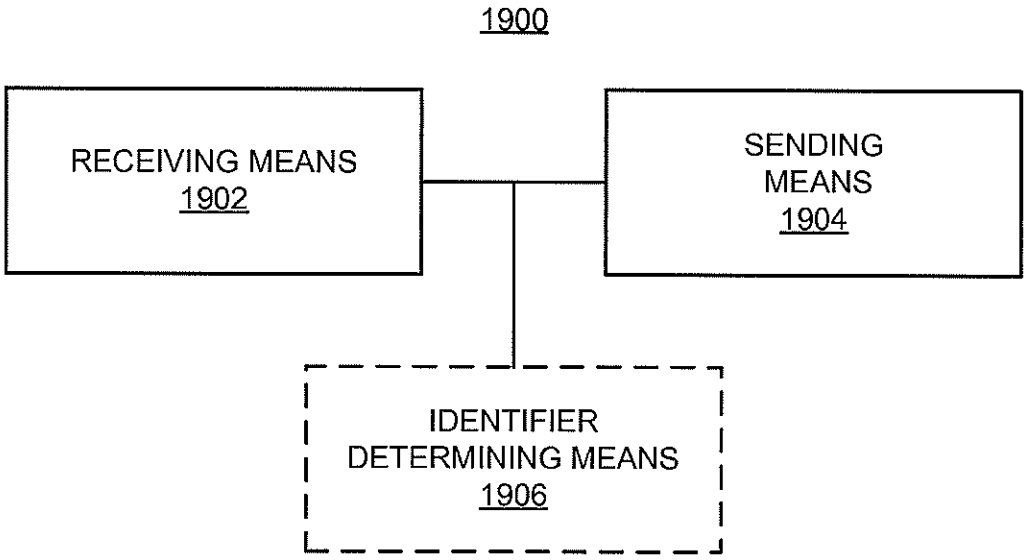
1900
RECEIVING MEANS 1902
SENDING MEANS 1904
IDENTIFIER DETERMINING MEANS 1906

FIG. 19

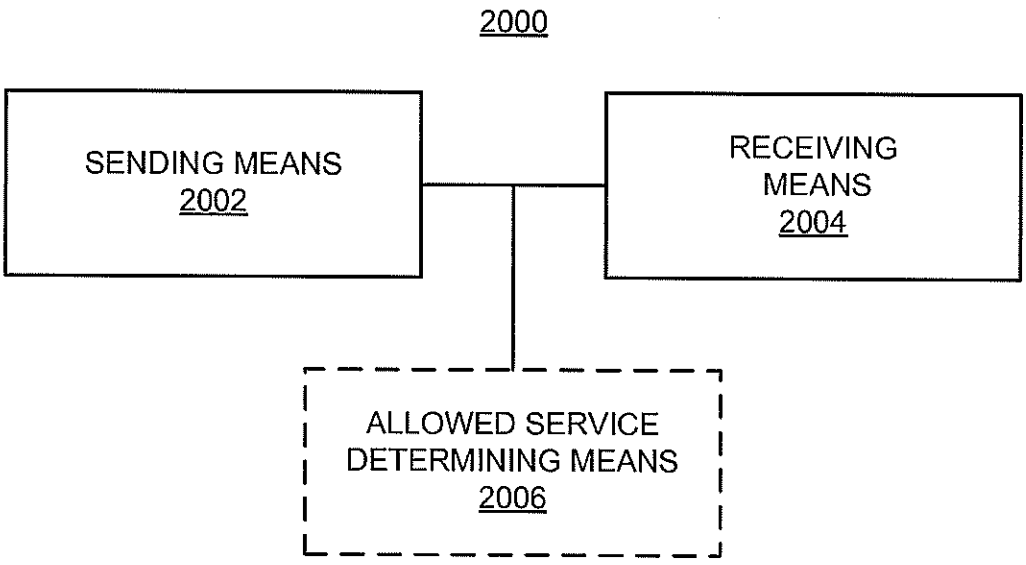
2000
SENDING MEANS
2002
RECEIVING
MEANS
2004
ALLOWED SERVICE
DETERMINING MEANS
2006

FIG. 20

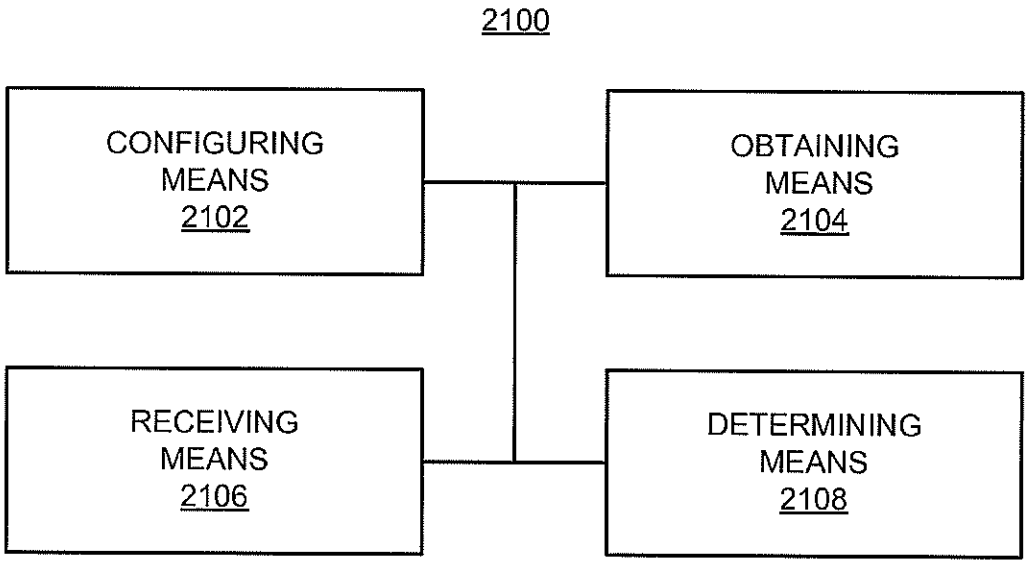
2100
CONFIGURING
MEANS
2102
OBTAINING
MEANS
2104
RECEIVING
MEANS
2106
DETERMINING
MEANS
2108

FIG. 21

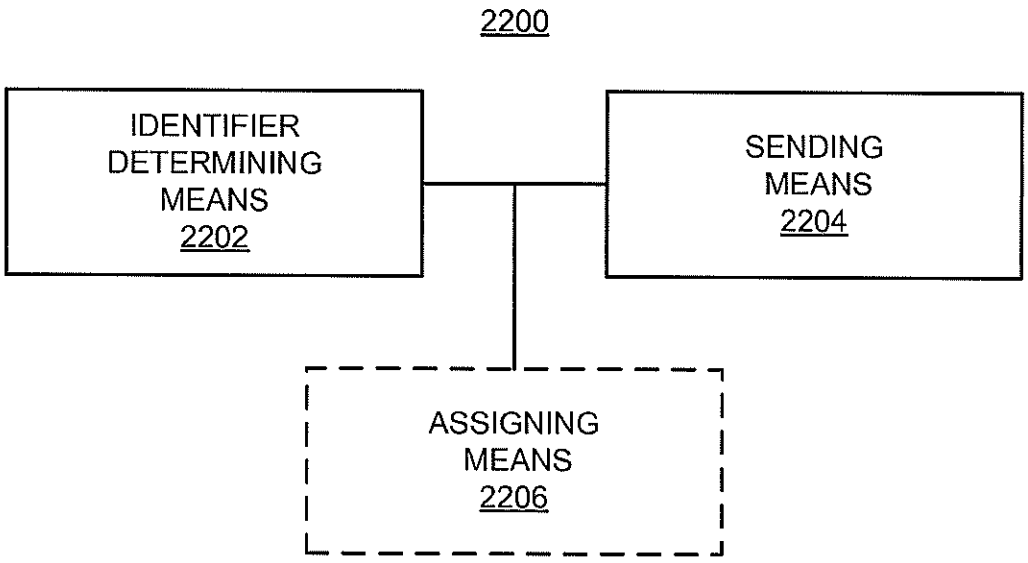

FIG. 22

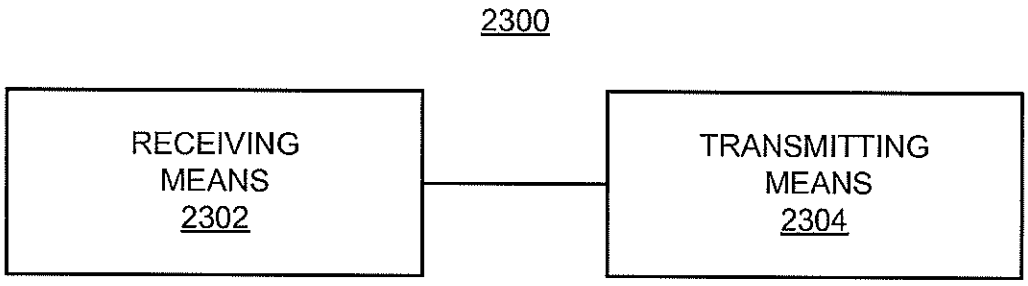

FIG. 23

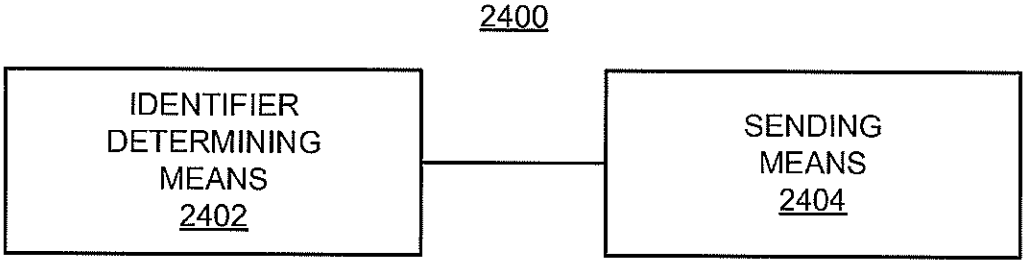

FIG. 24

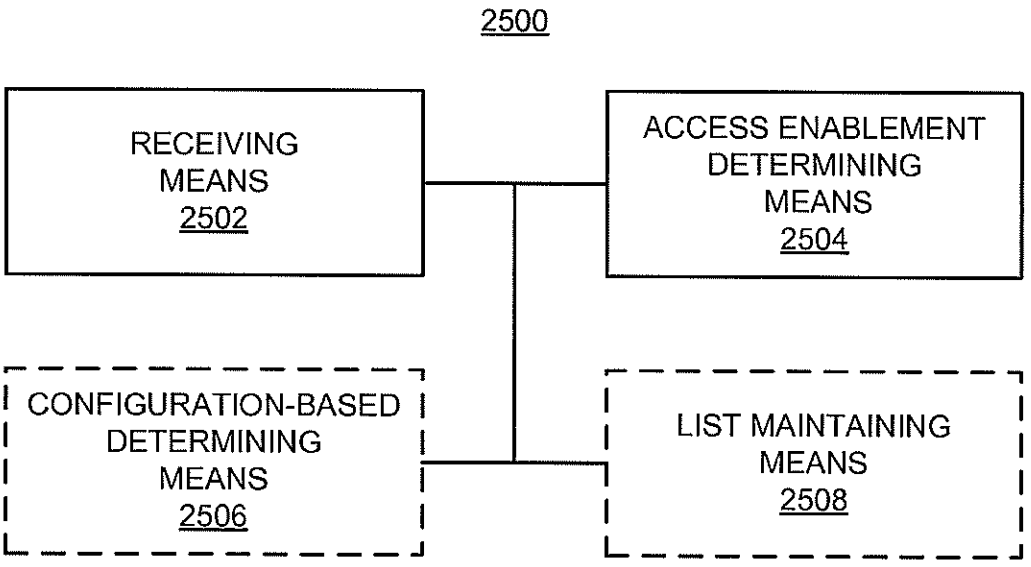
2500
RECEIVING MEANS 2502
ACCESS ENABLEMENT DETERMINING MEANS 2504
CONFIGURATION-BASED DETERMINING MEANS 2506
LIST MAINTAINING MEANS 2508

FIG. 25

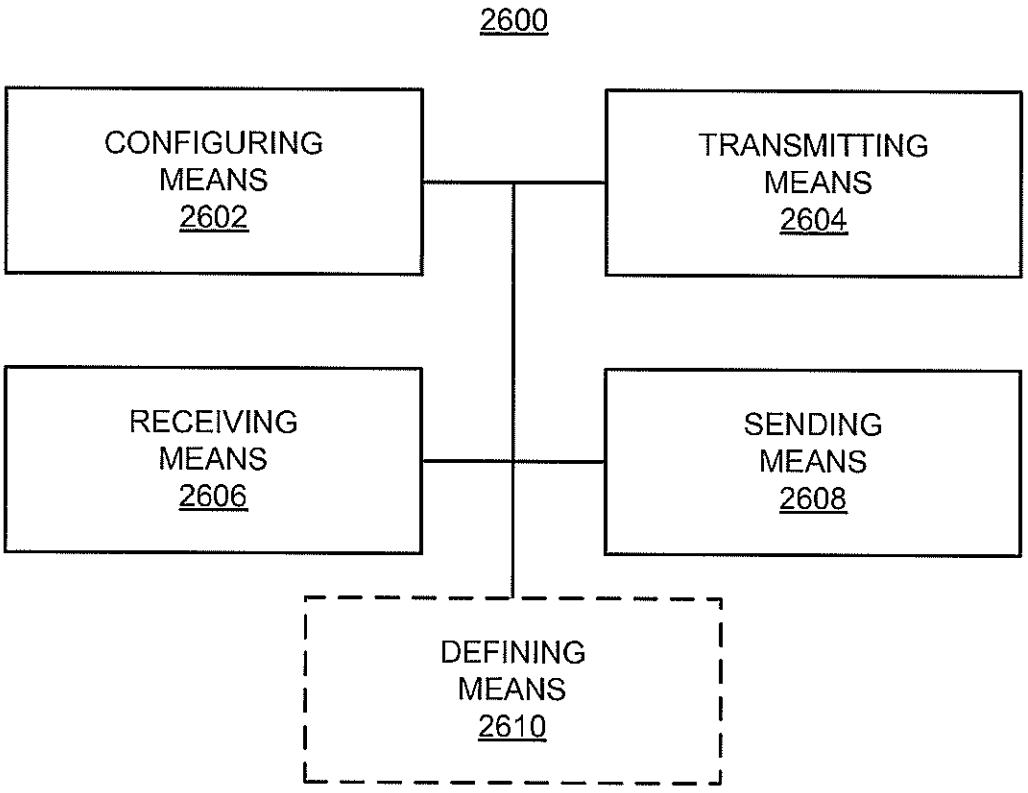
2600
CONFIGURING MEANS 2602
TRANSMITTING MEANS 2604
RECEIVING MEANS 2606
SENDING MEANS 2608
DEFINING MEANS 2610

FIG. 26

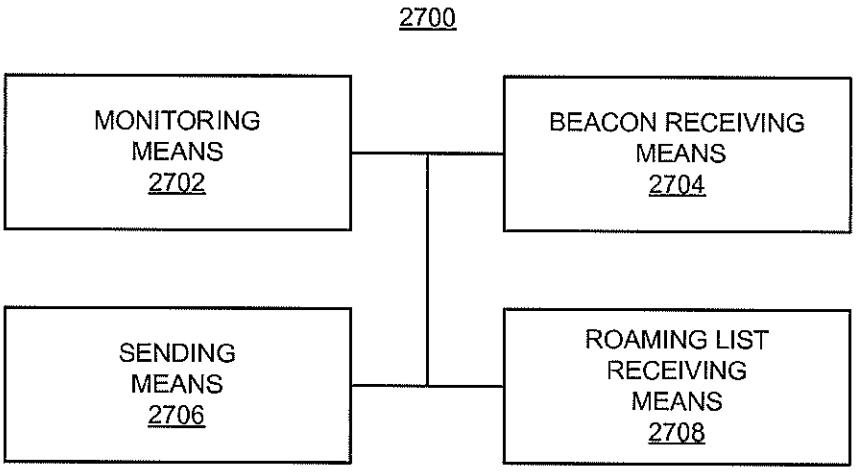
2700
MONITORING MEANS 2702
BEACON RECEIVING MEANS 2704
SENDING MEANS 2706
ROAMING LIST RECEIVING MEANS 2708

FIG. 27

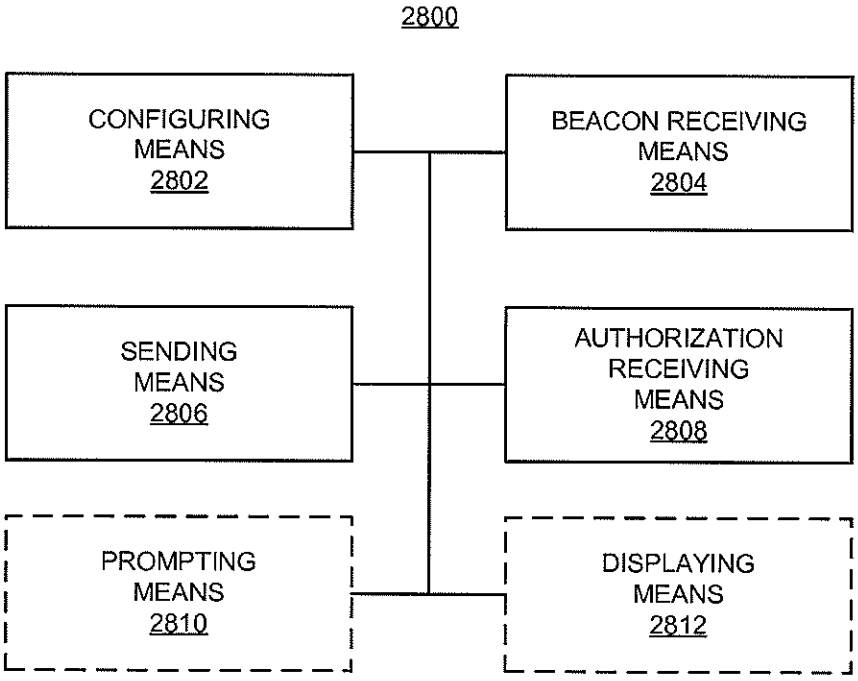
2800
CONFIGURING MEANS 2802
BEACON RECEIVING MEANS 2804
SENDING MEANS 2806
AUTHORIZATION RECEIVING MEANS 2808
PROMPTING MEANS 2810
DISPLAYING MEANS 2812

FIG. 28