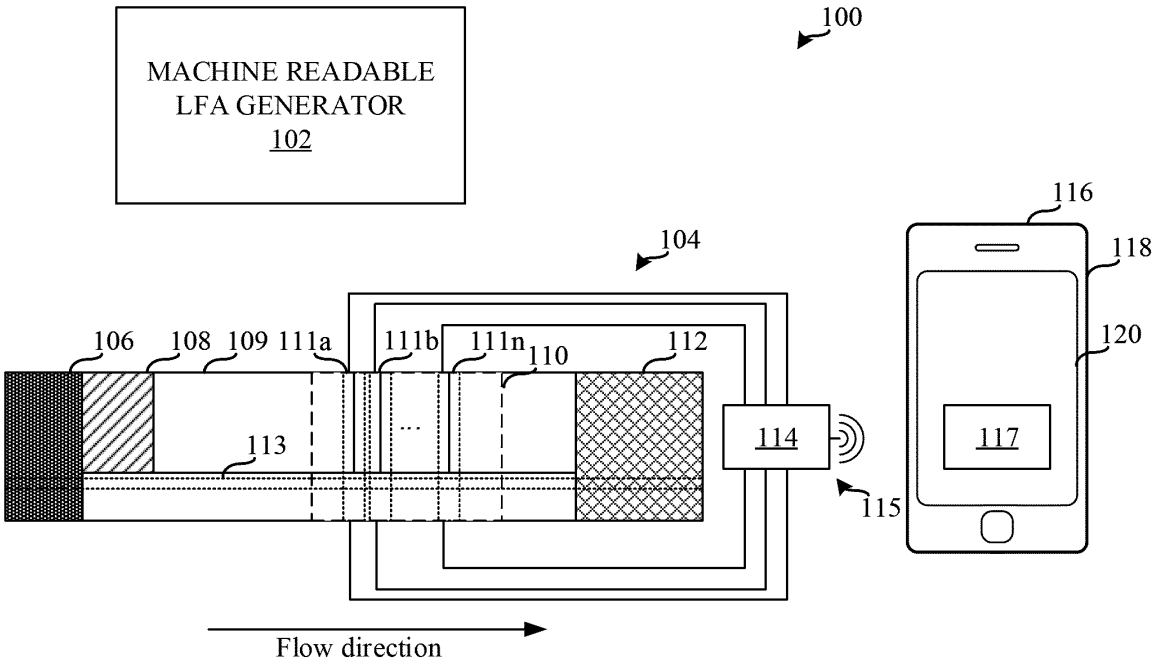

MACHINE READABLE
LFA GENERATOR
102
100
104
106
108
109
111a
111b
111n
110
112
113
114
115
116
117
118
120
Flow direction

FIG. 1A

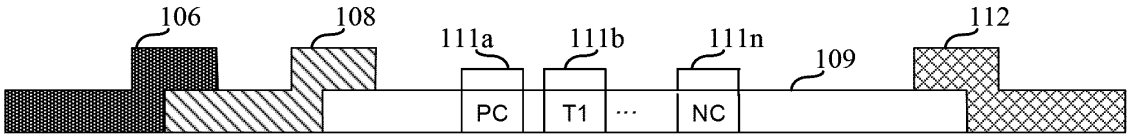

106
108
111a
111b
111n
109
112
PC
T1
NC

FIG. 1B

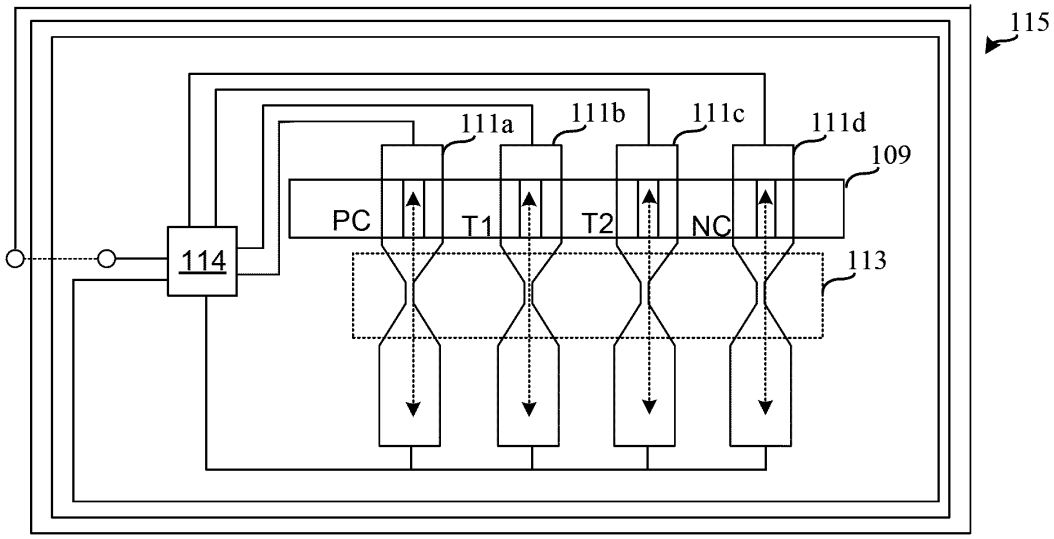


FIG. 2A

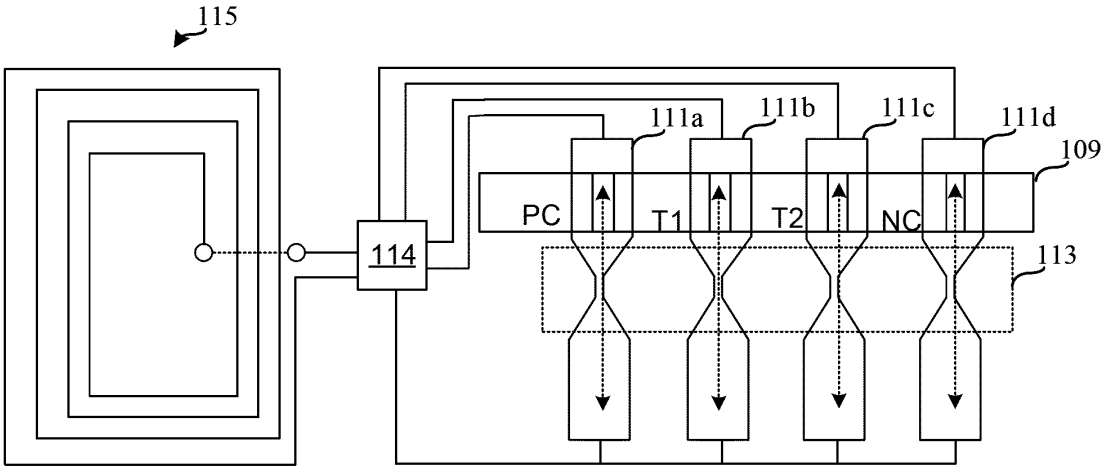


FIG. 2B

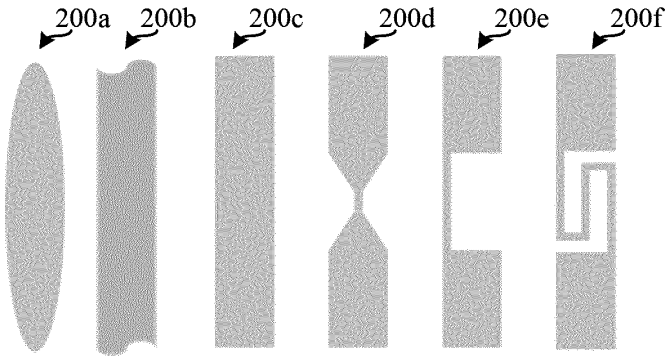


FIG. 2C

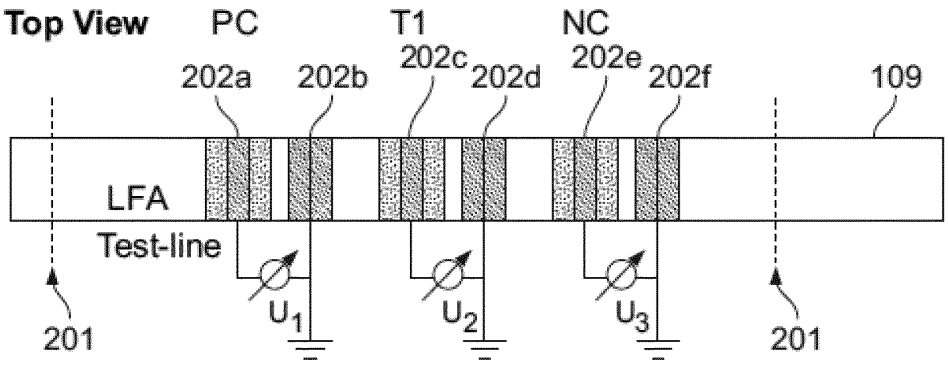

Top View
PC
T1
NC
202a
202b
202c
202d
202e
202f
109
LFA
Test-line
U_1
U_2
U_3
201
201

FIG. 2D

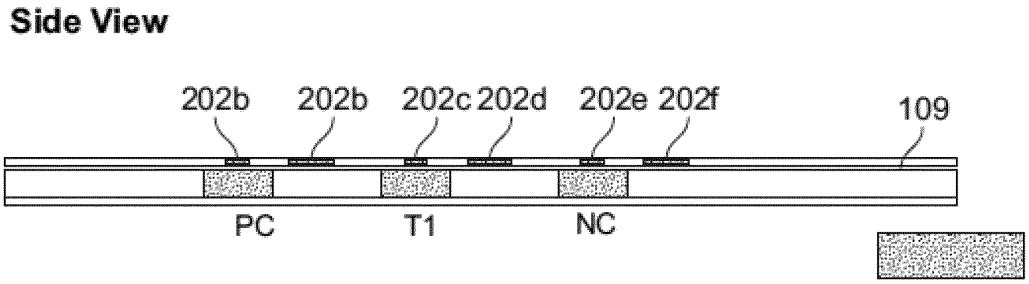

Side View
202b
202b
202c
202d
202e
202f
109
PC
T1
NC

FIG. 2E

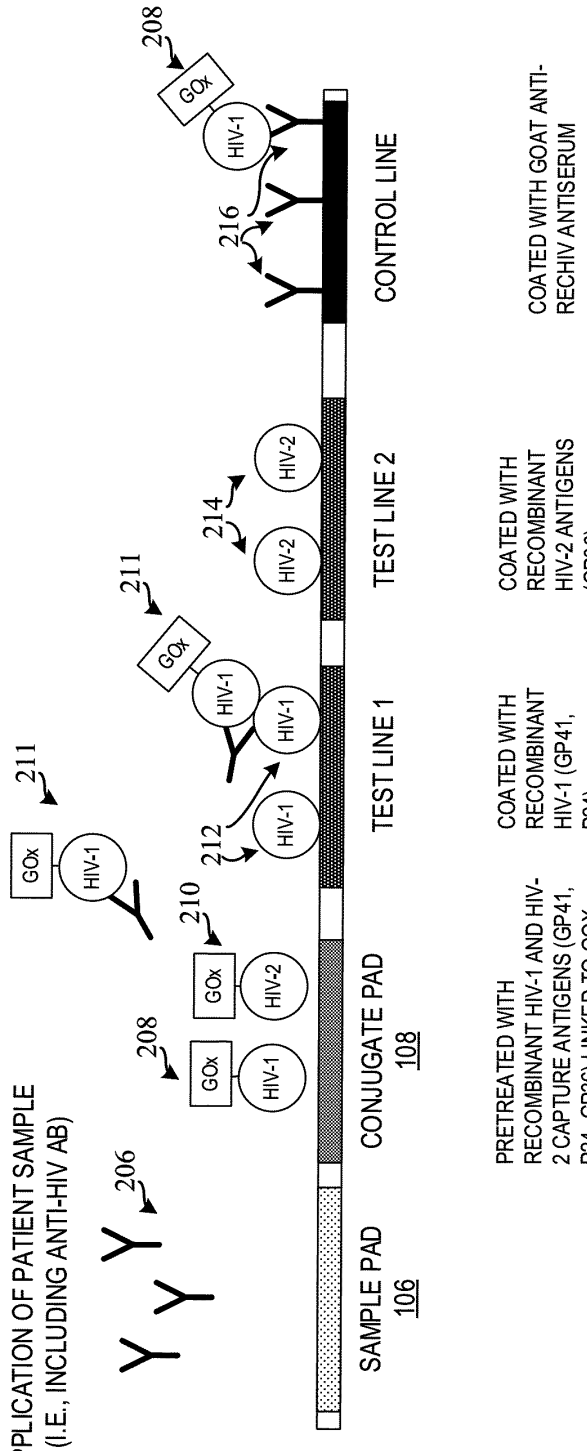

204
APPLICATION OF PATIENT SAMPLE
(I.E., INCLUDING ANTI-HIV AB)
206
SAMPLE PAD
106
CONJUGATE PAD
108
TEST LINE 1
TEST LINE 2
CONTROL LINE
208
210
211
212
214
216
GOx
HIV-1
HIV-2
PRETREATED WITH RECOMBINANT HIV-1 AND HIV-2 CAPTURE ANTIGENS (GP41, P24, GP36) LINKED TO GOX
COATED WITH RECOMBINANT HIV-1 (GP41, P24)
COATED WITH RECOMBINANT HIV-2 ANTIGENS (GP36)
COATED WITH GOAT ANTI-RECHIV ANTISERUM
FLOW

FIG. 2F

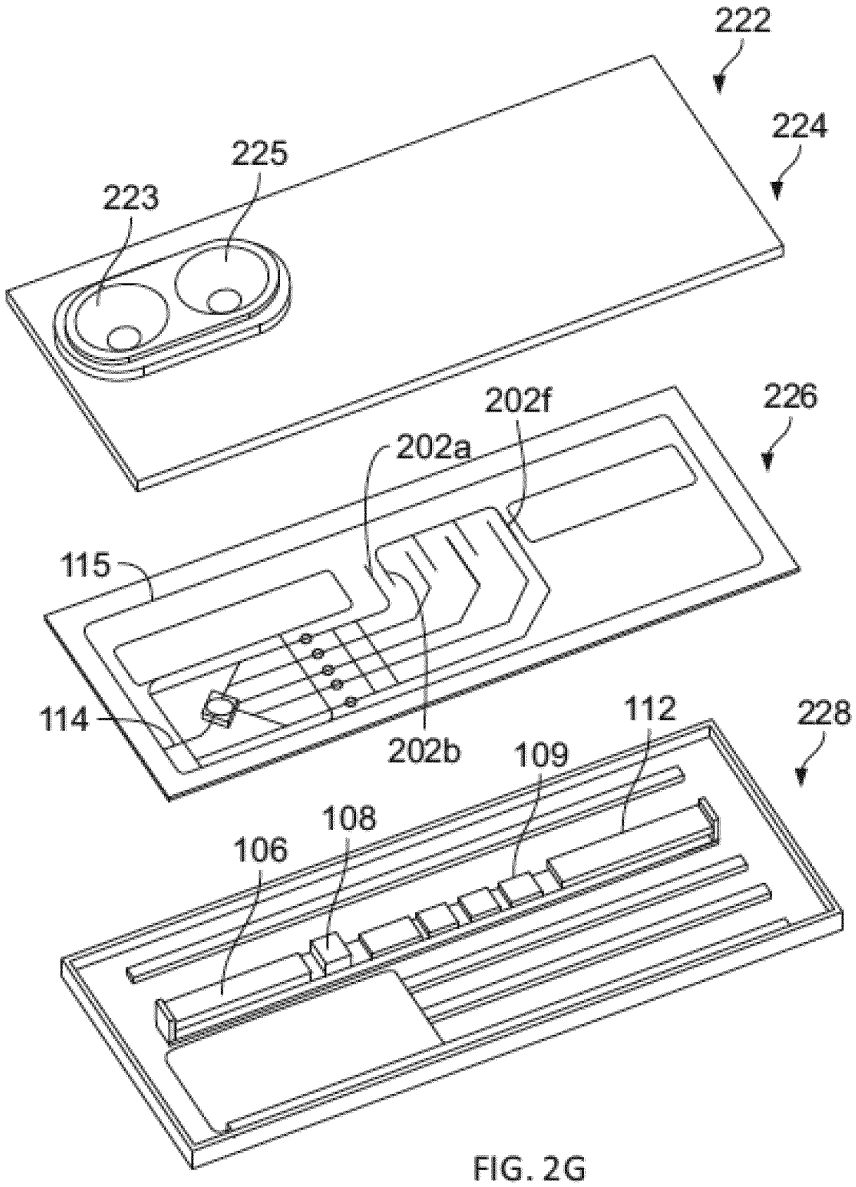


FIG. 2G

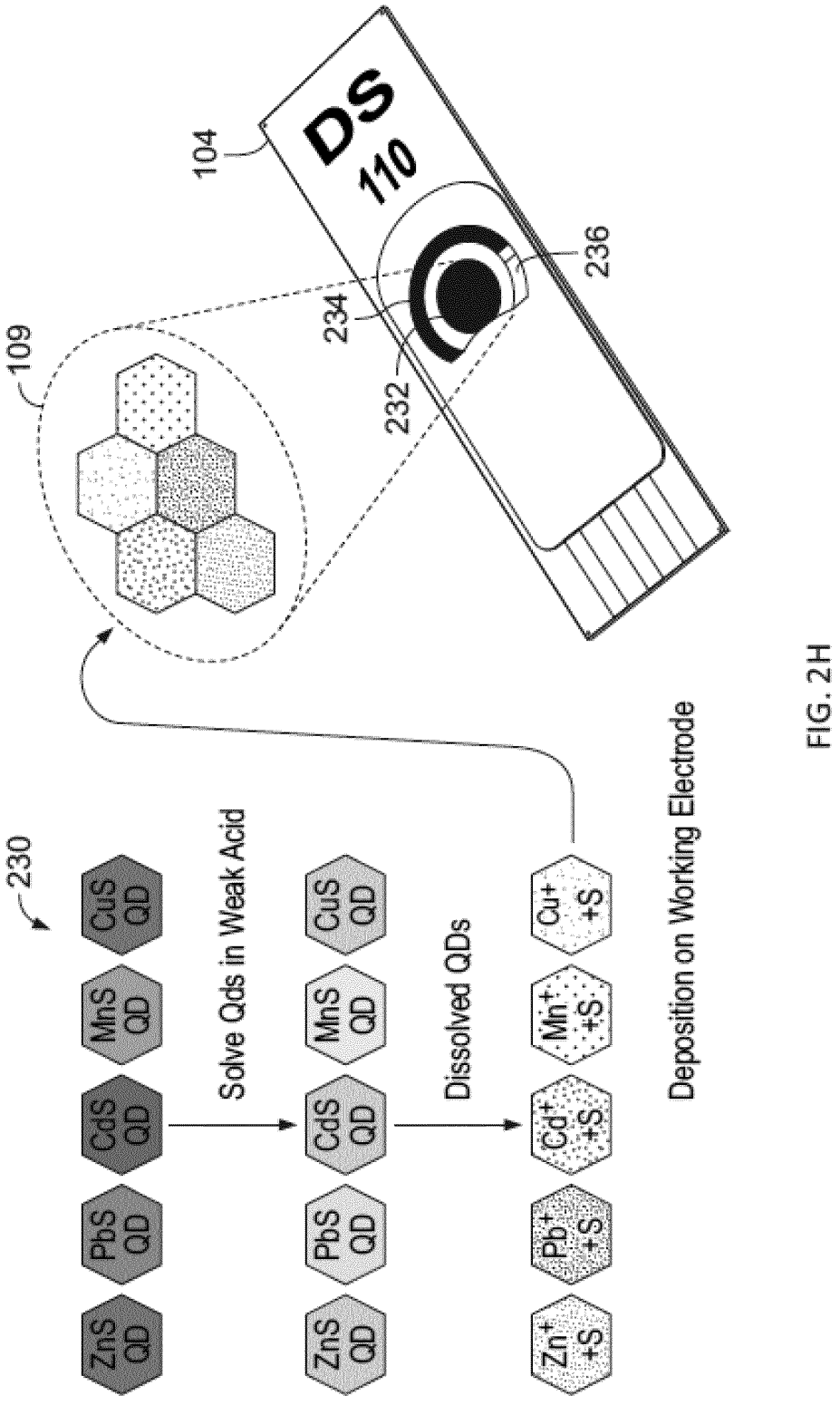

104
DS
110
236
234
232
109
230
ZnS QD
PbS QD
CdS QD
MnS QD
CuS QD
Solve Qds in Weak Acid
Dissolved QDs
Deposition on Working Electrode
Zn+ +S
Pb+ +S
Cd+ +S
Mn+ +S
Cu+ +S

FIG. 2H

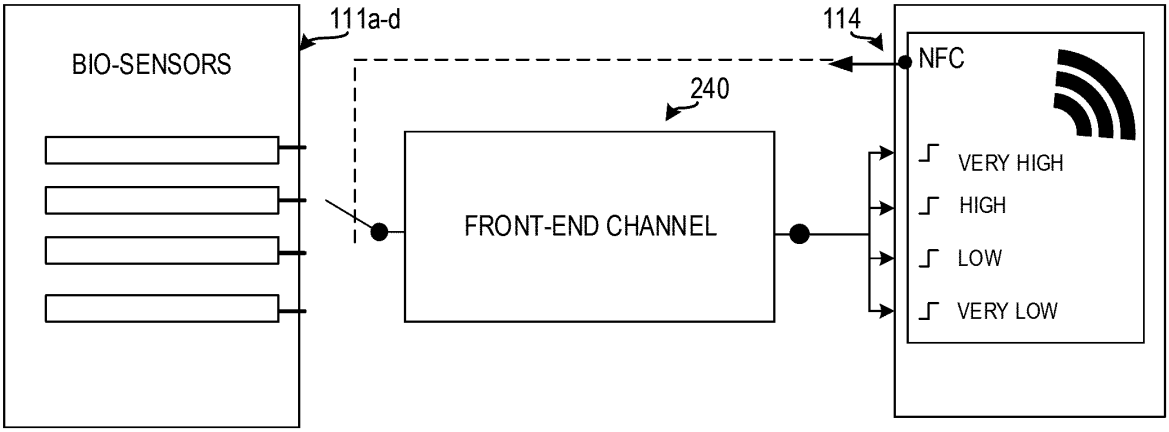


FIG. 2I

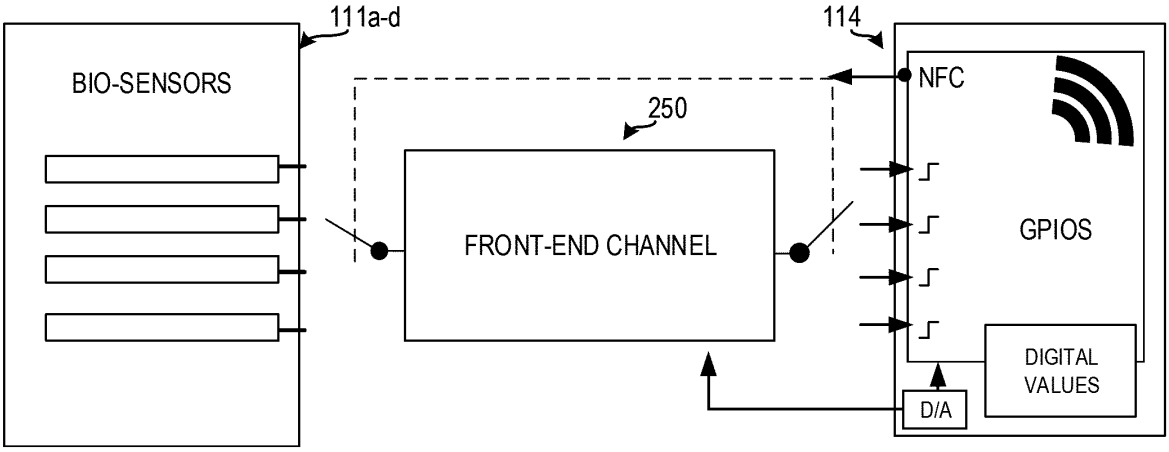


FIG. 2J

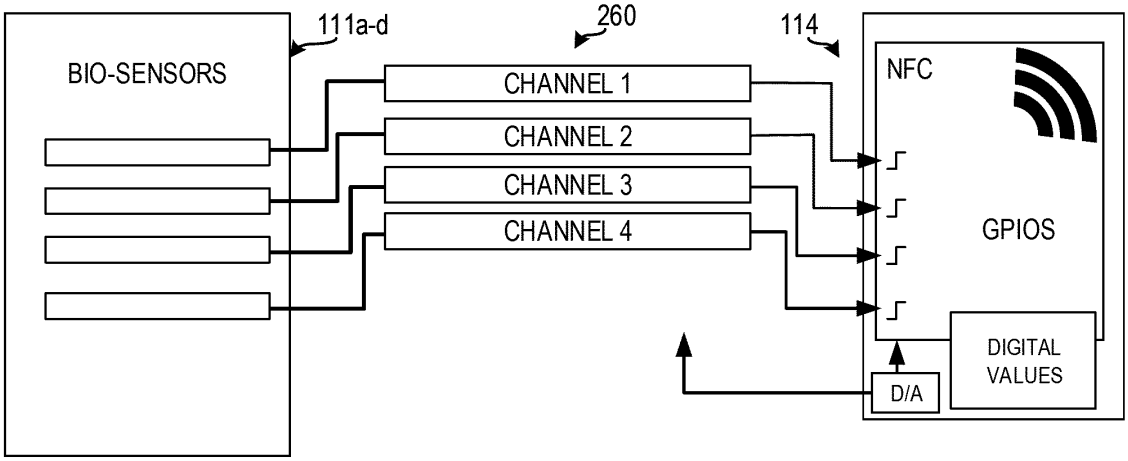


FIG. 2K

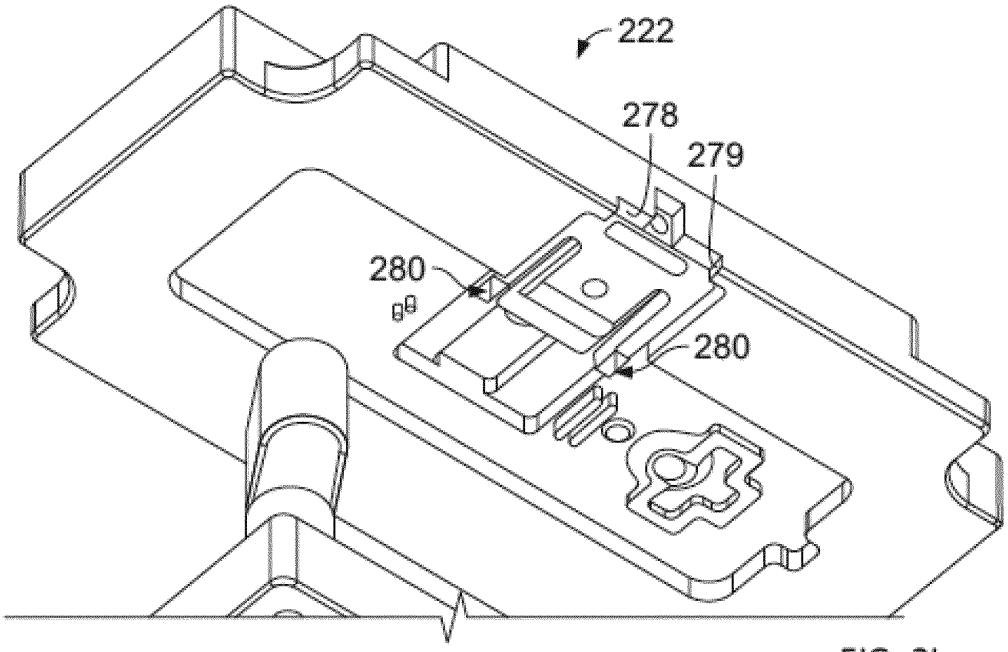


FIG. 2L

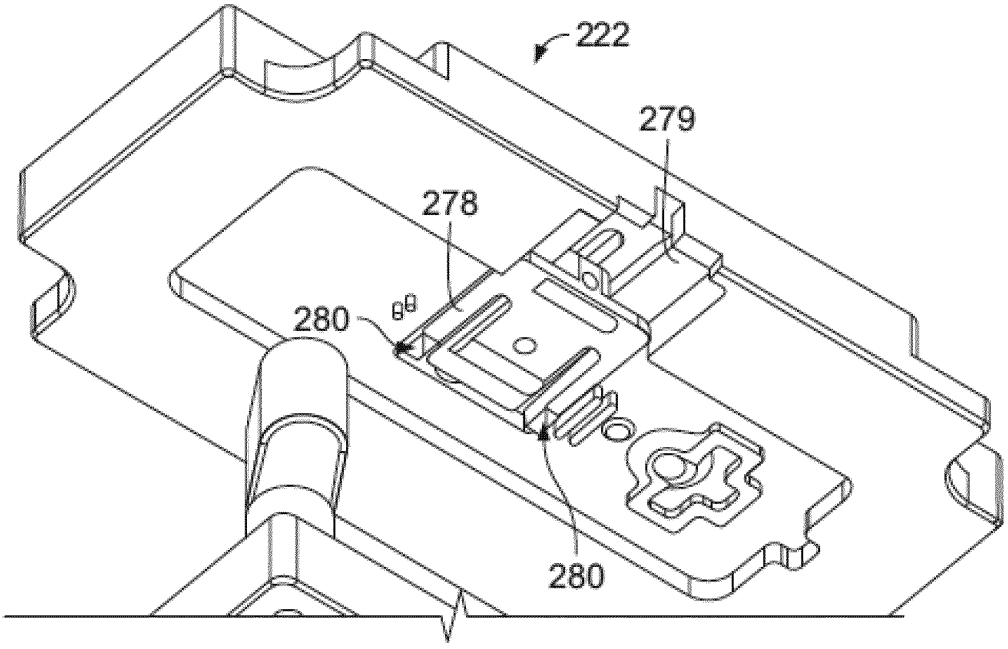


FIG. 2M

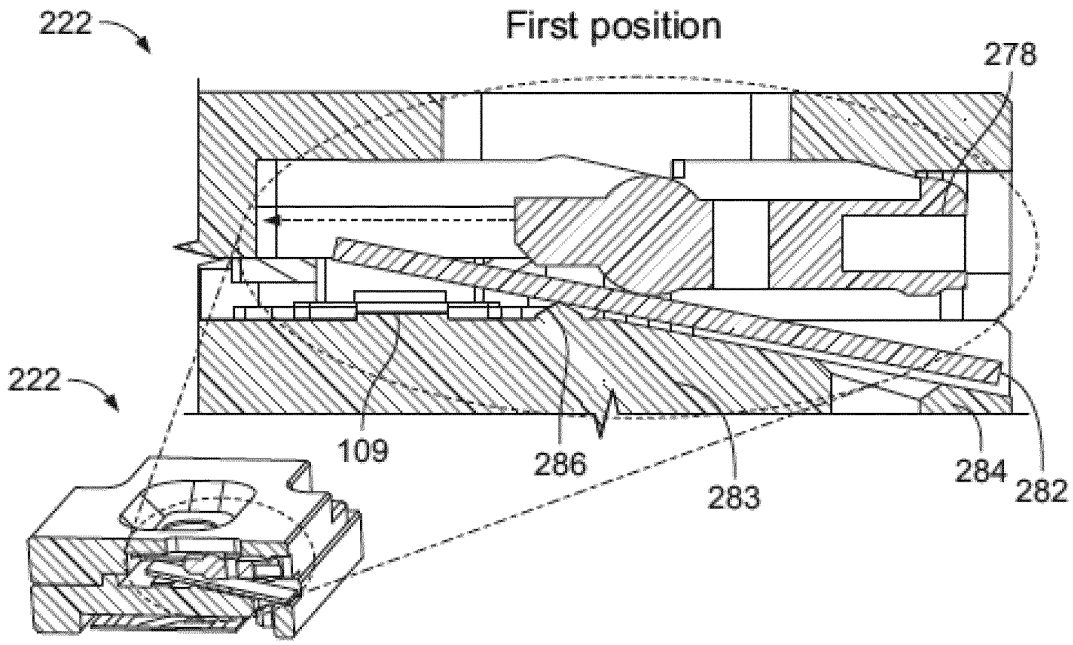

222
First position
278
222
109
286
283
284
282

FIG. 2N

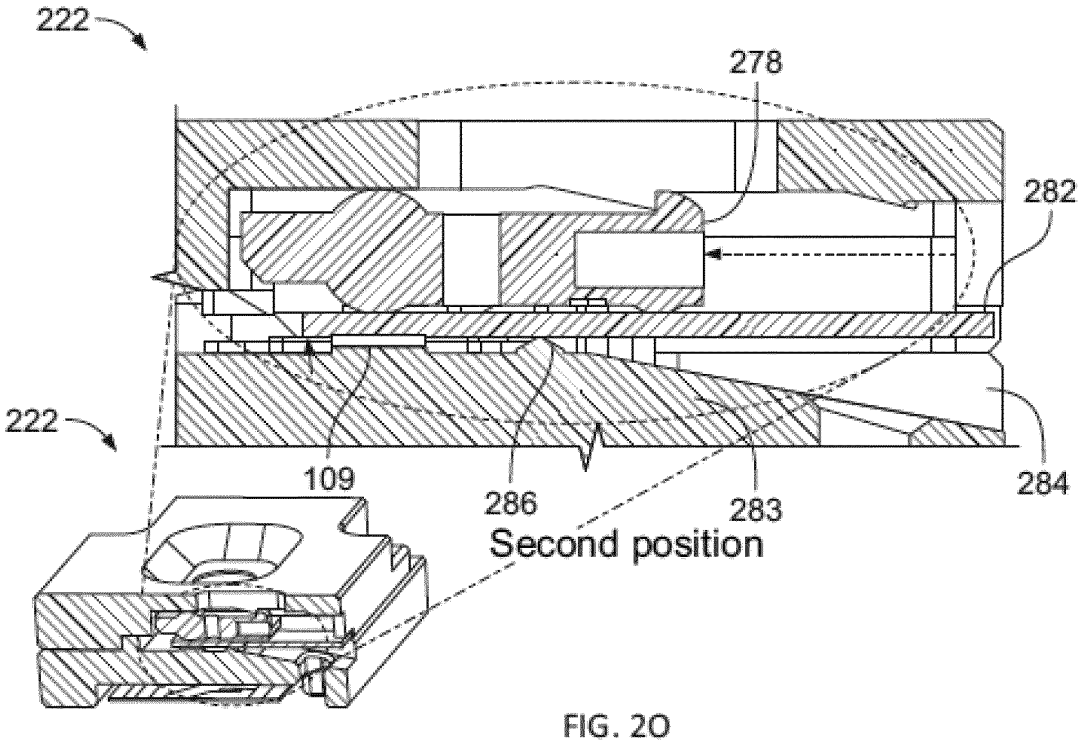

222
278
282
222
109
286
283
284
Second position

FIG. 2O

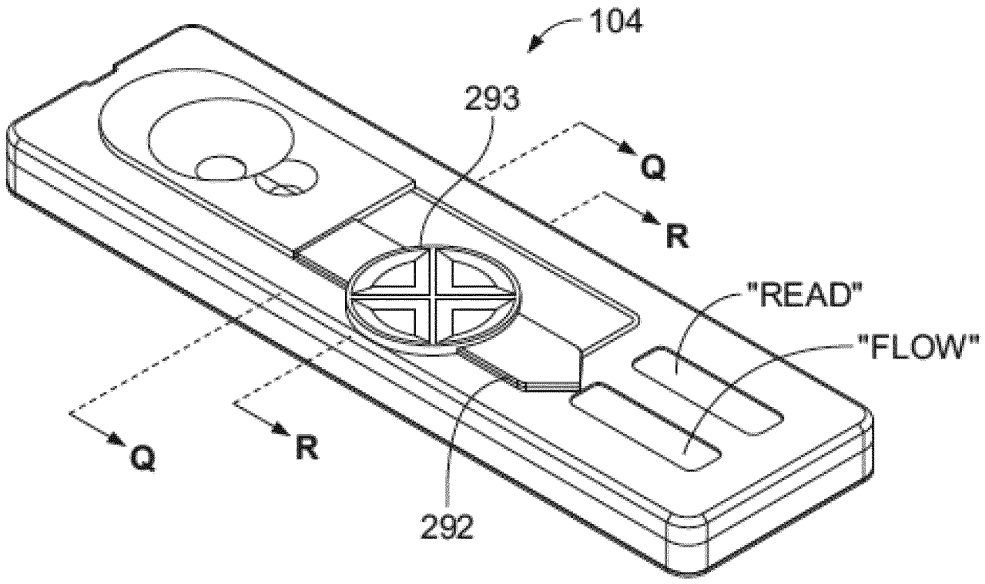


FIG. 2P

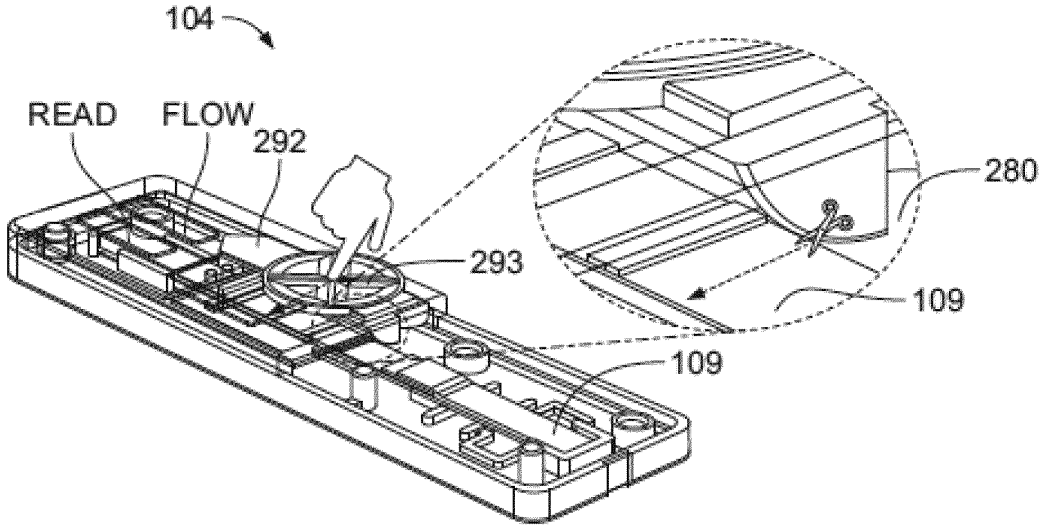

104
READ
FLOW
292
293
280
109
109

FIG. 2Q

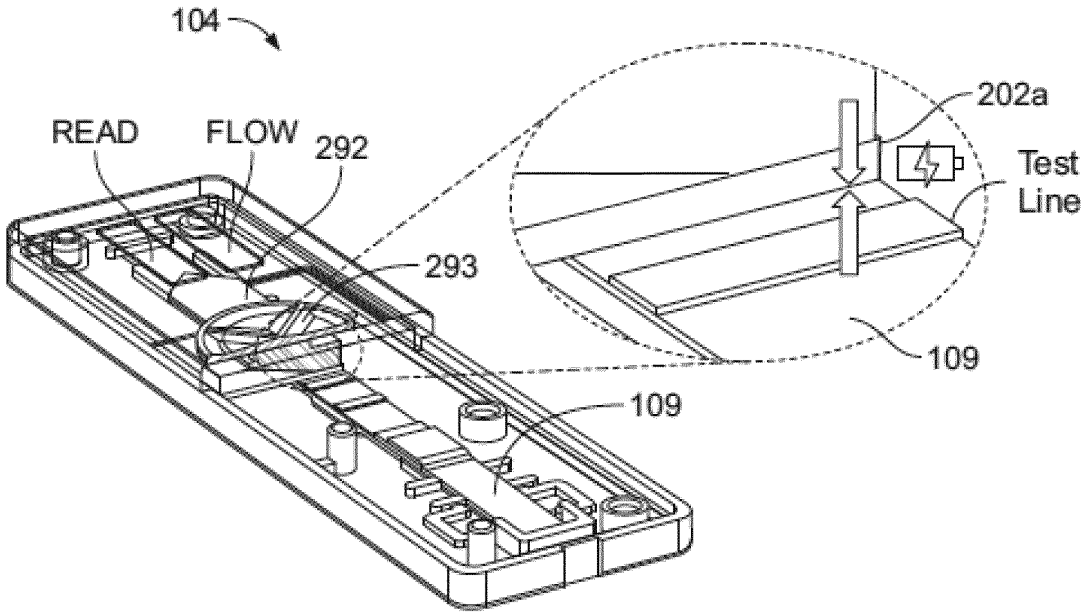

104
READ
FLOW
292
293
202a
Test
Line
109
109

FIG. 2R

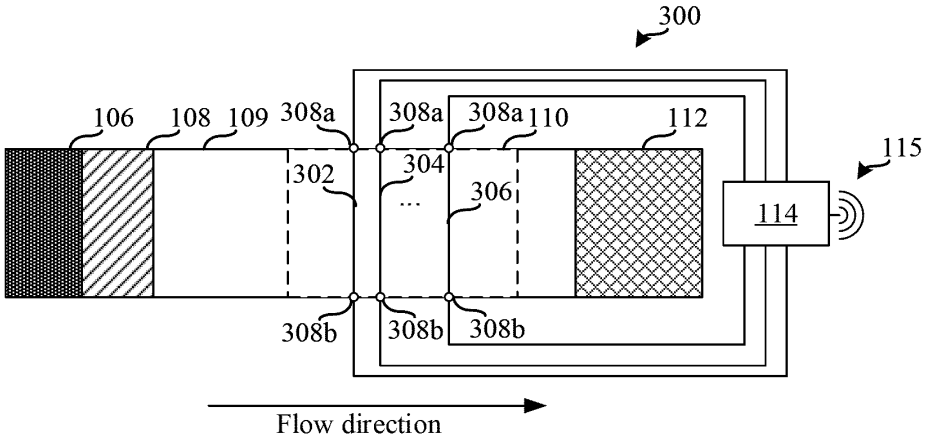

300
106
108
109
308a
308a
308a
110
112
115
302
304
306
114
308b
308b
308b
Flow direction

FIG. 3A

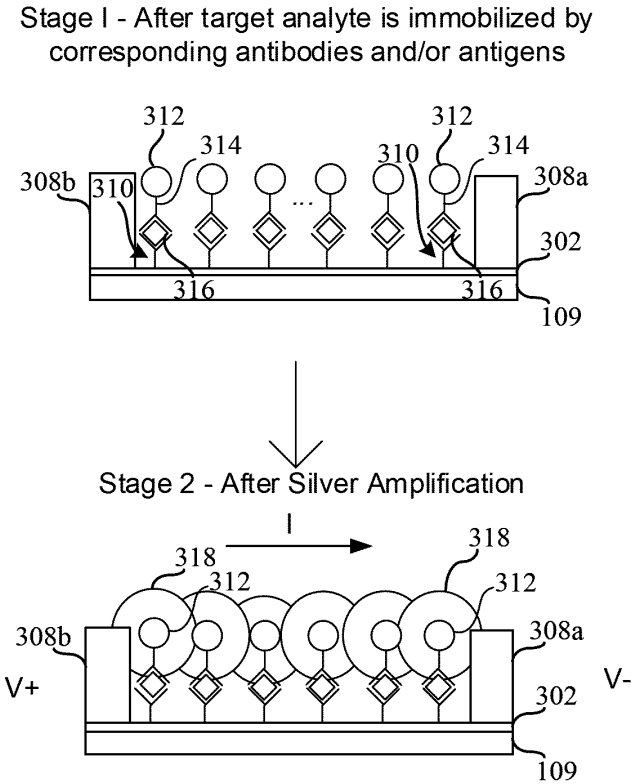

Stage I - After target analyte is immobilized by corresponding antibodies and/or antigens
312
314
312
314
310
308b
310
308a
302
316
316
109
Stage 2 - After Silver Amplification
I
318
318
312
312
308b
308a
V+
V-
302
109

FIG. 3B

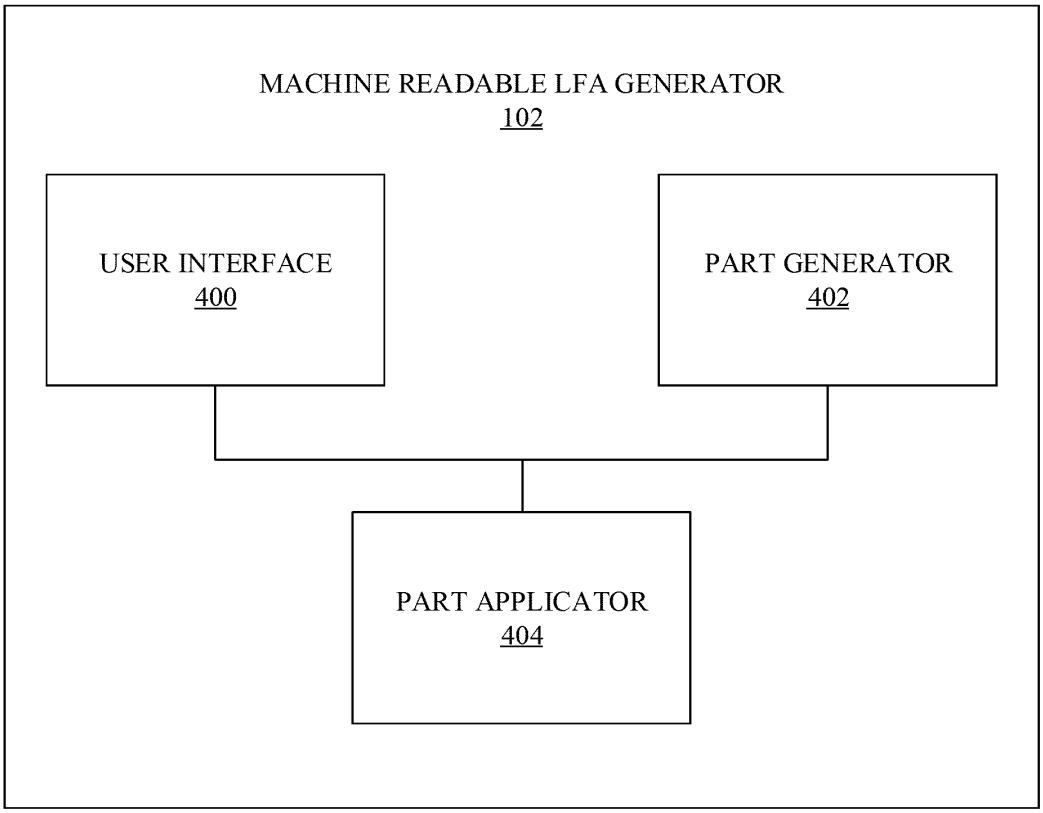

MACHINE READABLE LFA GENERATOR
102
USER INTERFACE
400
PART GENERATOR
402
PART APPLICATOR
404

FIG. 4

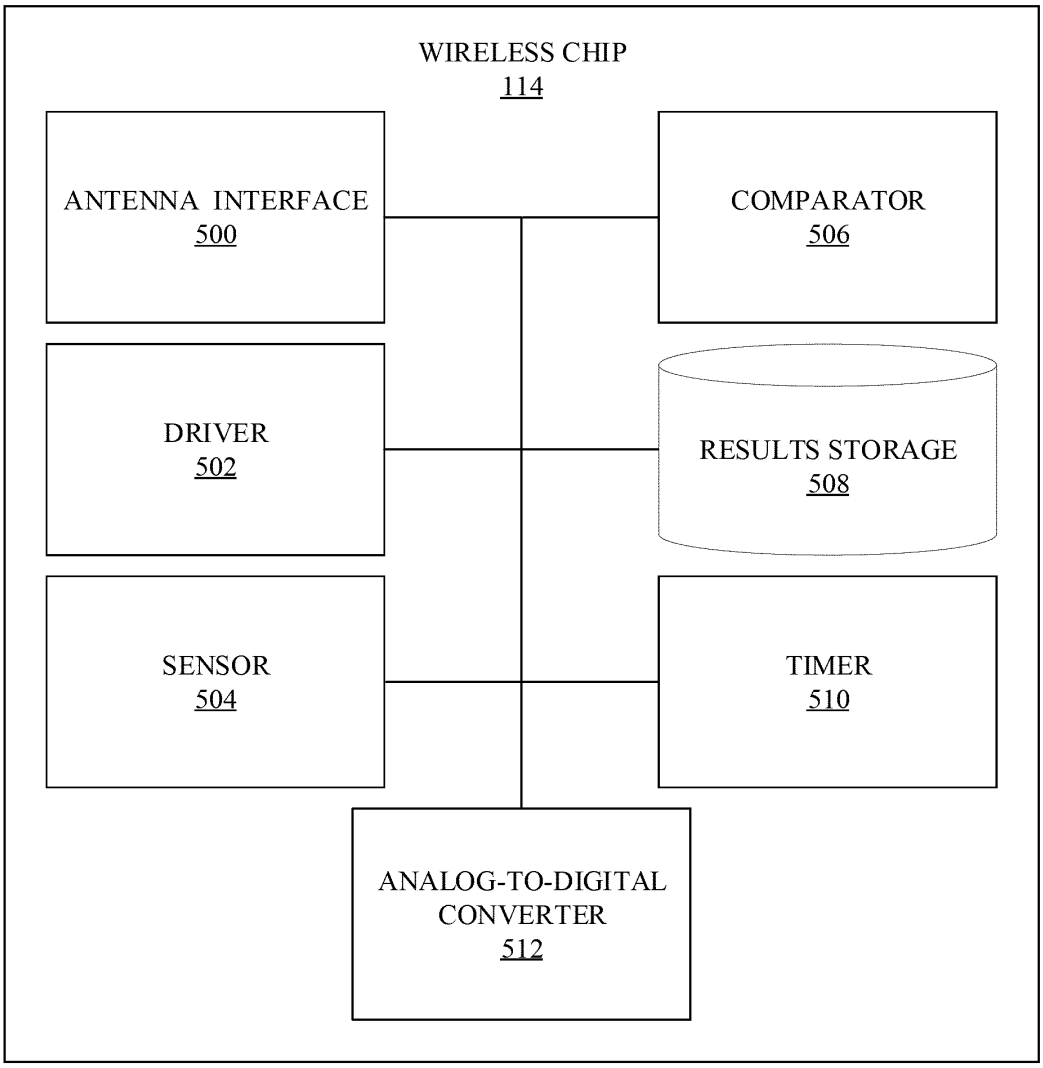

WIRELESS CHIP
114
ANTENNA INTERFACE
500
COMPARATOR
506
DRIVER
502
RESULTS STORAGE
508
SENSOR
504
TIMER
510
ANALOG-TO-DIGITAL
CONVERTER
512

FIG. 5

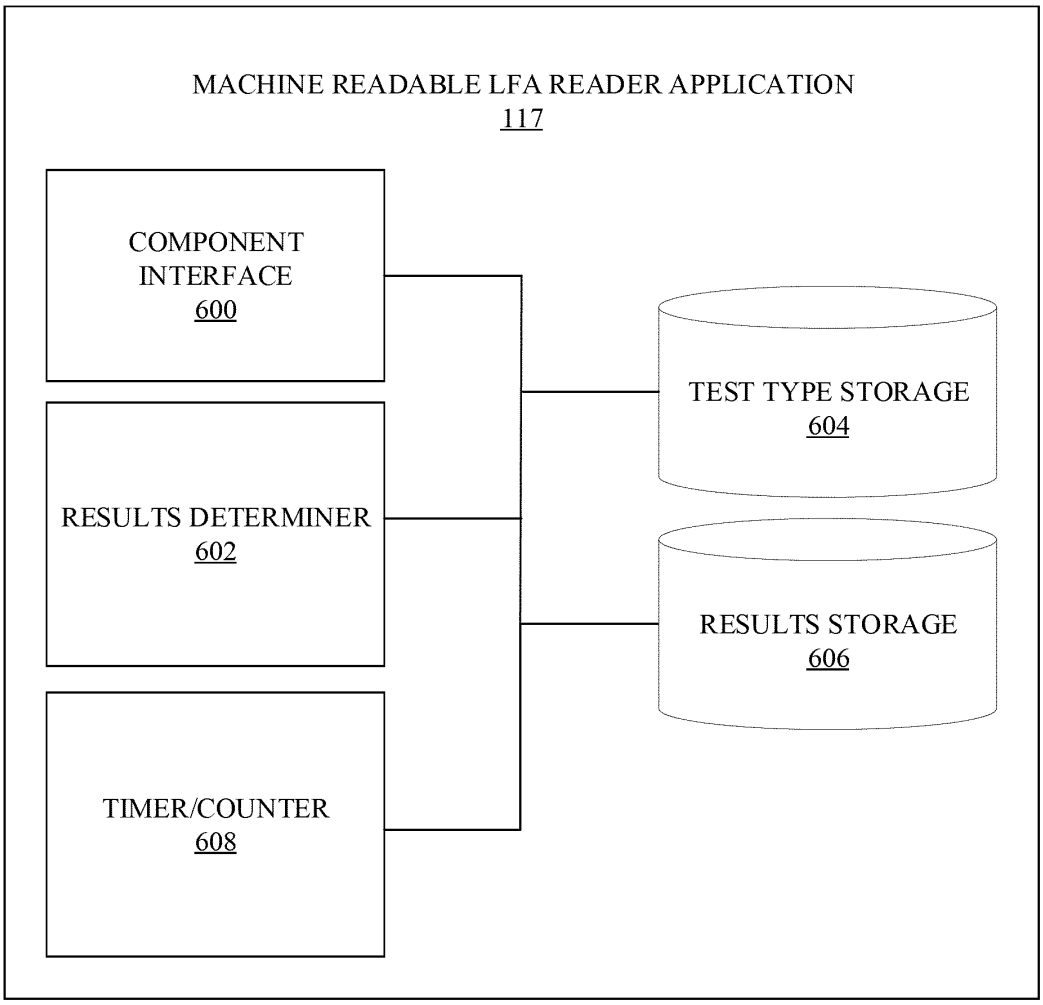

MACHINE READABLE LFA READER APPLICATION
117
COMPONENT INTERFACE
600
RESULTS DETERMINER
602
TIMER/COUNTER
608
TEST TYPE STORAGE
604
RESULTS STORAGE
606

FIG. 6

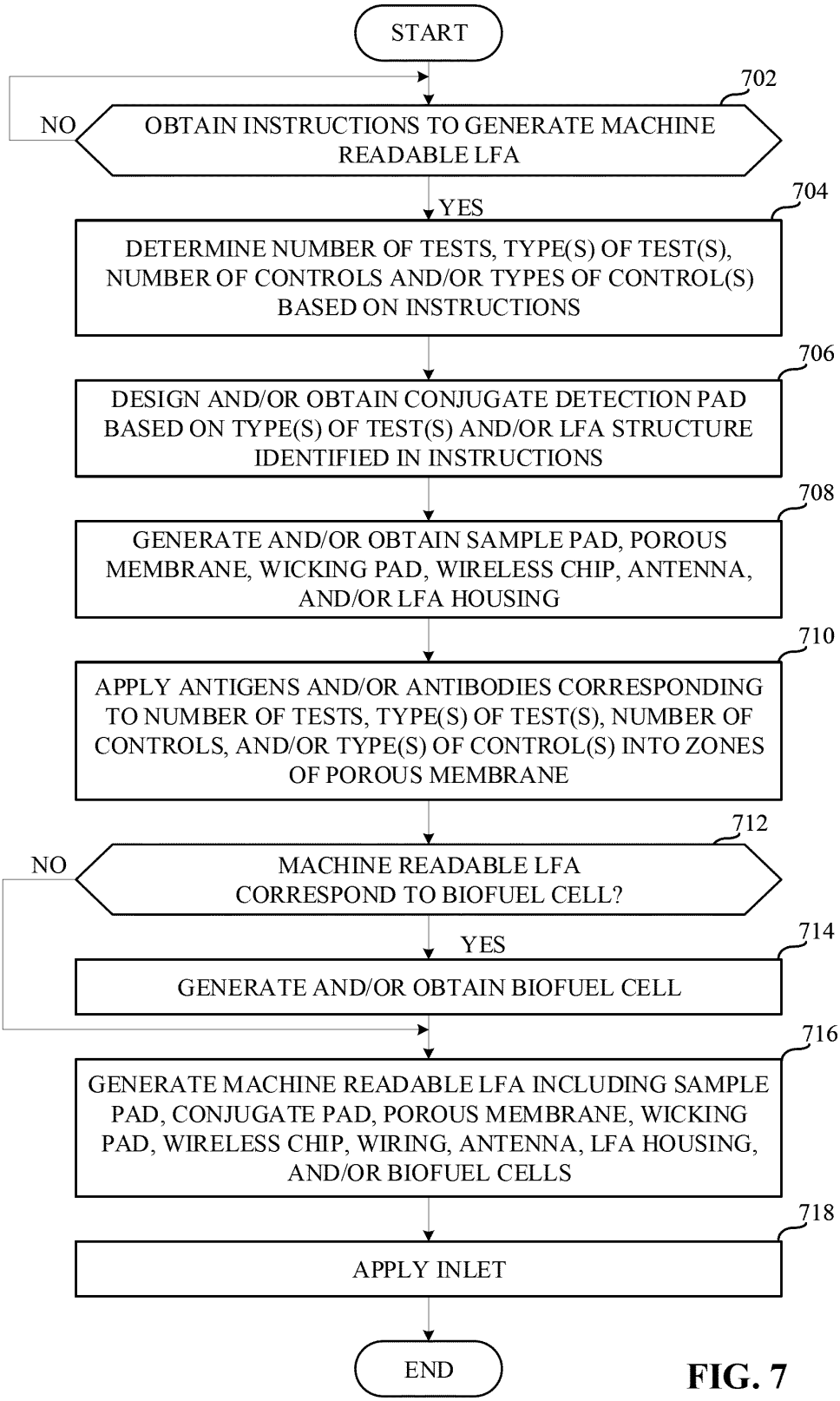

START
700
702
NO
OBTAIN INSTRUCTIONS TO GENERATE MACHINE READABLE LFA
YES
704
DETERMINE NUMBER OF TESTS, TYPE(S) OF TEST(S), NUMBER OF CONTROLS AND/OR TYPES OF CONTROL(S) BASED ON INSTRUCTIONS
706
DESIGN AND/OR OBTAIN CONJUGATE DETECTION PAD BASED ON TYPE(S) OF TEST(S) AND/OR LFA STRUCTURE IDENTIFIED IN INSTRUCTIONS
708
GENERATE AND/OR OBTAIN SAMPLE PAD, POROUS MEMBRANE, WICKING PAD, WIRELESS CHIP, ANTENNA, AND/OR LFA HOUSING
710
APPLY ANTIGENS AND/OR ANTIBODIES CORRESPONDING TO NUMBER OF TESTS, TYPE(S) OF TEST(S), NUMBER OF CONTROLS, AND/OR TYPE(S) OF CONTROL(S) INTO ZONES OF POROUS MEMBRANE
712
NO
MACHINE READABLE LFA CORRESPOND TO BIOFUEL CELL?
YES
714
GENERATE AND/OR OBTAIN BIOFUEL CELL
716
GENERATE MACHINE READABLE LFA INCLUDING SAMPLE PAD, CONJUGATE PAD, POROUS MEMBRANE, WICKING PAD, WIRELESS CHIP, WIRING, ANTENNA, LFA HOUSING, AND/OR BIOFUEL CELLS
718
APPLY INLET
END

FIG. 7

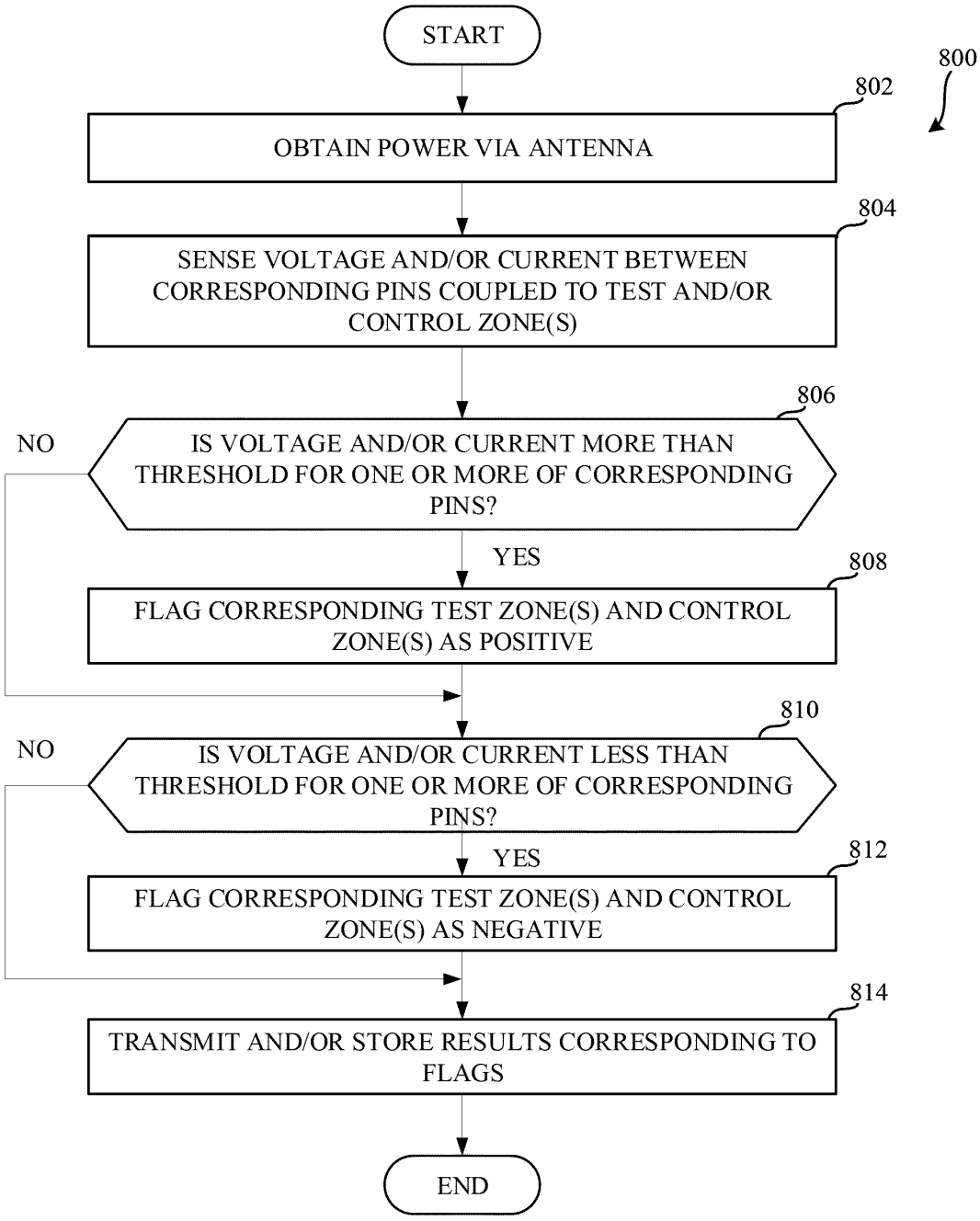

START
800
802
OBTAIN POWER VIA ANTENNA
804
SENSE VOLTAGE AND/OR CURRENT BETWEEN CORRESPONDING PINS COUPLED TO TEST AND/OR CONTROL ZONE(S)
806
NO
IS VOLTAGE AND/OR CURRENT MORE THAN THRESHOLD FOR ONE OR MORE OF CORRESPONDING PINS?
YES
808
FLAG CORRESPONDING TEST ZONE(S) AND CONTROL ZONE(S) AS POSITIVE
810
NO
IS VOLTAGE AND/OR CURRENT LESS THAN THRESHOLD FOR ONE OR MORE OF CORRESPONDING PINS?
YES
812
FLAG CORRESPONDING TEST ZONE(S) AND CONTROL ZONE(S) AS NEGATIVE
814
TRANSMIT AND/OR STORE RESULTS CORRESPONDING TO FLAGS
END

FIG. 8A

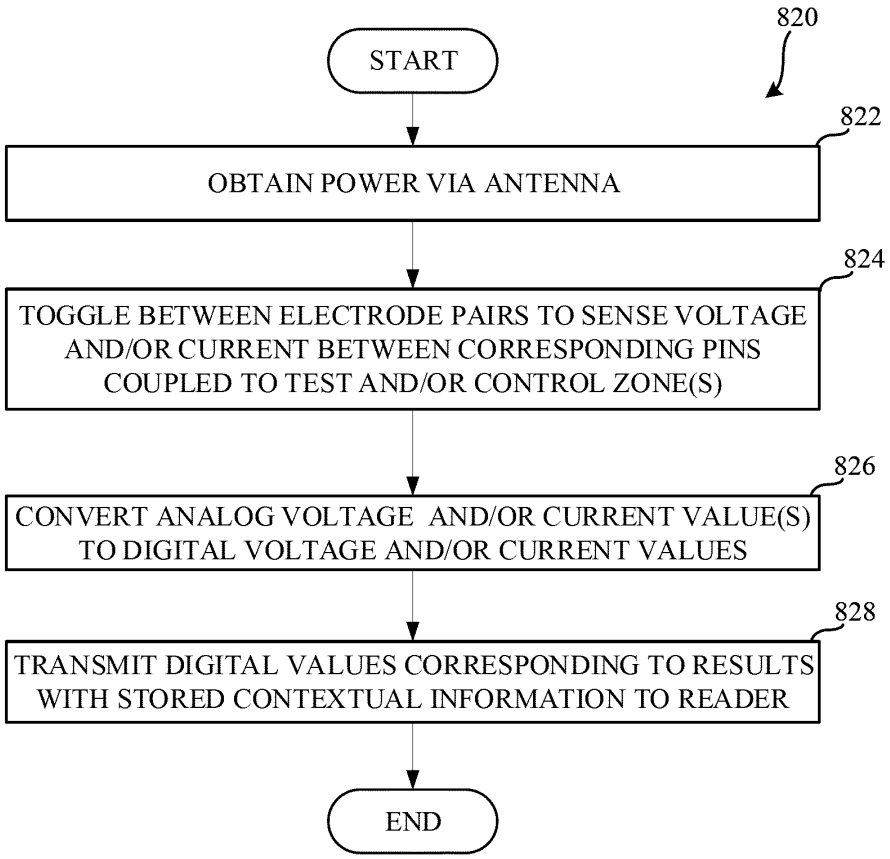

820
START
822
OBTAIN POWER VIA ANTENNA
824
TOGGLE BETWEEN ELECTRODE PAIRS TO SENSE VOLTAGE AND/OR CURRENT BETWEEN CORRESPONDING PINS COUPLED TO TEST AND/OR CONTROL ZONE(S)
826
CONVERT ANALOG VOLTAGE AND/OR CURRENT VALUE(S) TO DIGITAL VOLTAGE AND/OR CURRENT VALUES
828
TRANSMIT DIGITAL VALUES CORRESPONDING TO RESULTS WITH STORED CONTEXTUAL INFORMATION TO READER
END

FIG. 8B

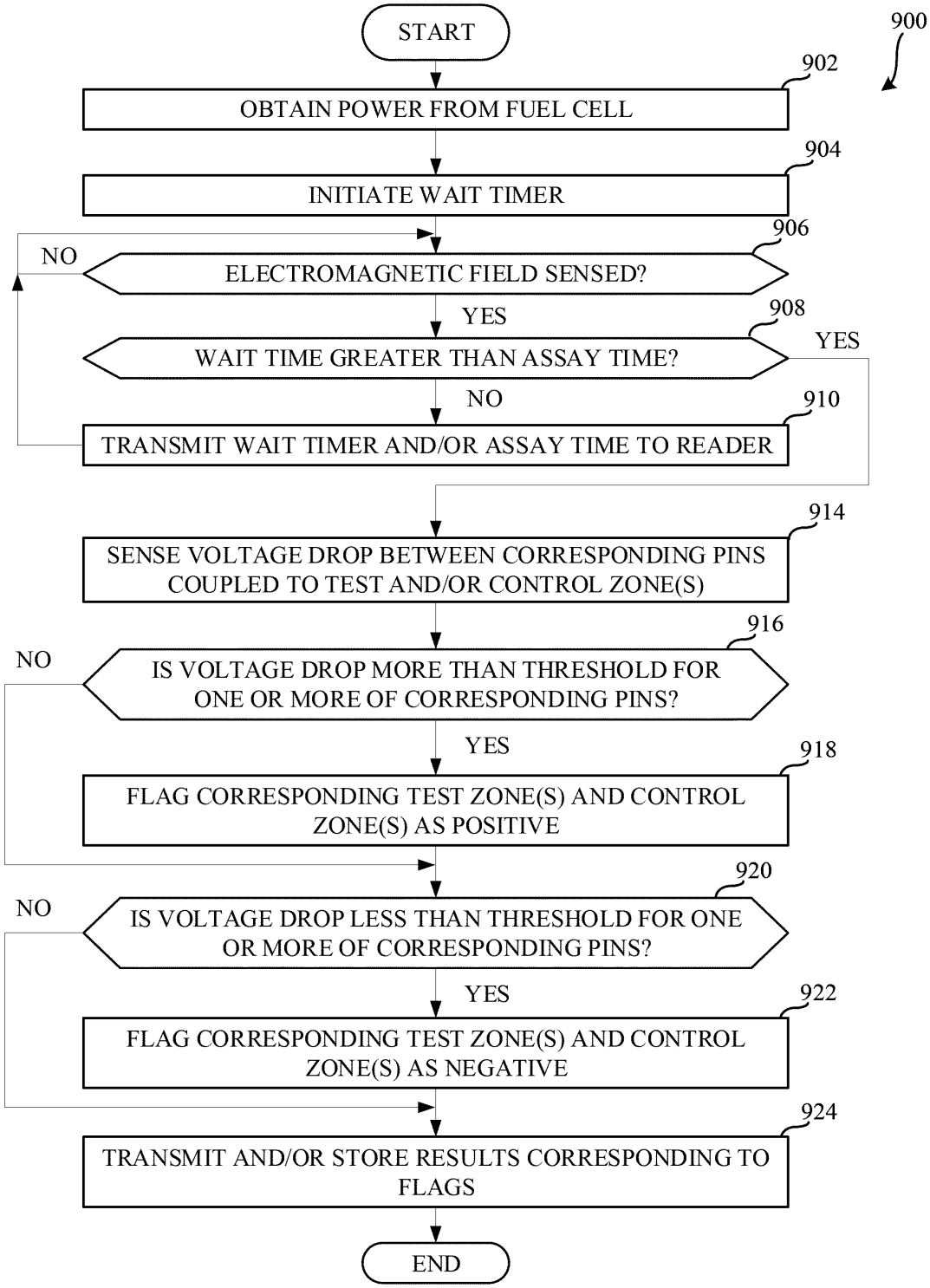

START
900
902
OBTAIN POWER FROM FUEL CELL
904
INITIATE WAIT TIMER
906
NO
ELECTROMAGNETIC FIELD SENSED?
YES
908
WAIT TIME GREATER THAN ASSAY TIME?
YES
NO
910
TRANSMIT WAIT TIMER AND/OR ASSAY TIME TO READER
914
SENSE VOLTAGE DROP BETWEEN CORRESPONDING PINS COUPLED TO TEST AND/OR CONTROL ZONE(S)
916
NO
IS VOLTAGE DROP MORE THAN THRESHOLD FOR ONE OR MORE OF CORRESPONDING PINS?
YES
918
FLAG CORRESPONDING TEST ZONE(S) AND CONTROL ZONE(S) AS POSITIVE
920
NO
IS VOLTAGE DROP LESS THAN THRESHOLD FOR ONE OR MORE OF CORRESPONDING PINS?
YES
922
FLAG CORRESPONDING TEST ZONE(S) AND CONTROL ZONE(S) AS NEGATIVE
924
TRANSMIT AND/OR STORE RESULTS CORRESPONDING TO FLAGS
END

FIG. 9

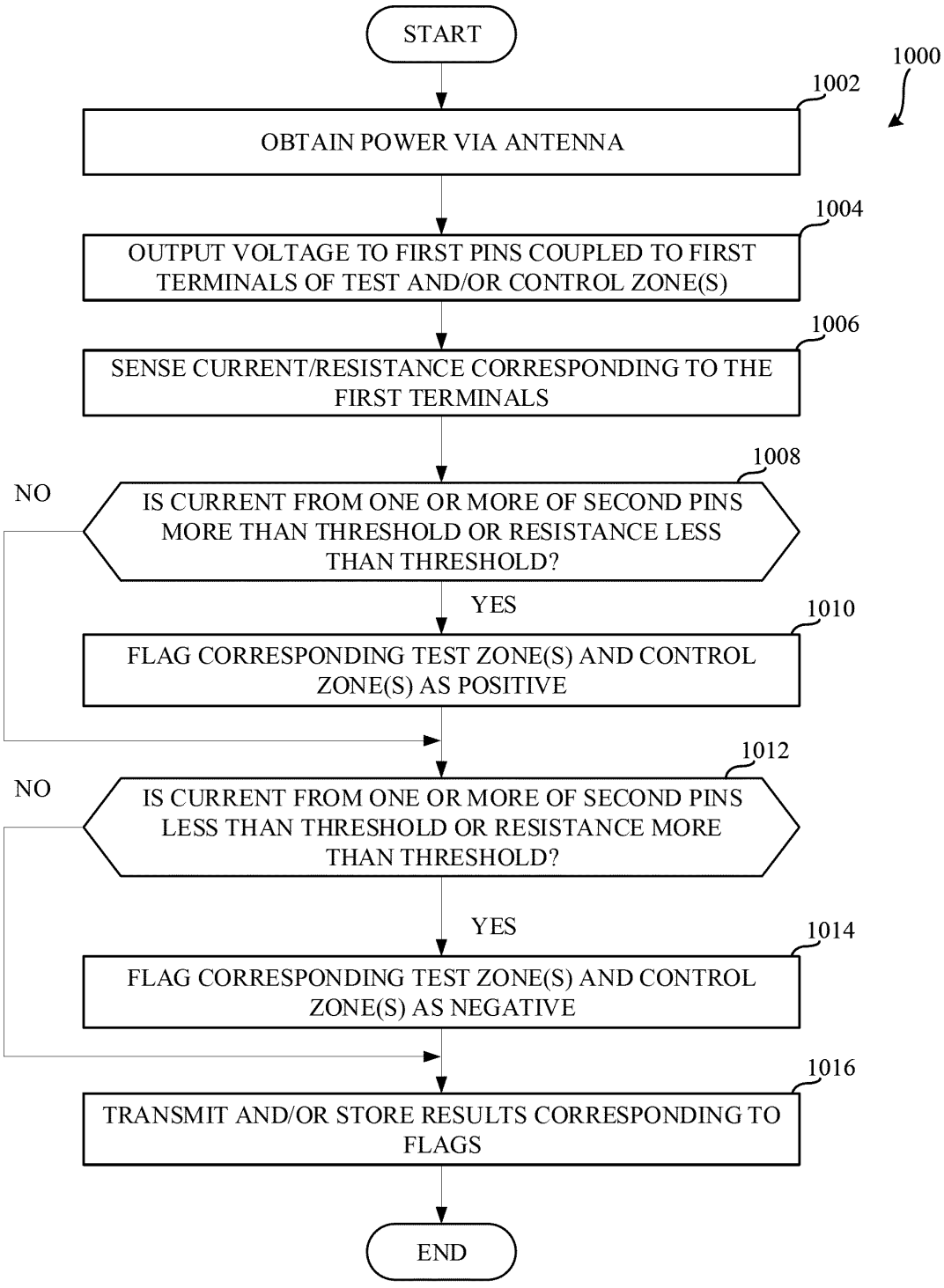

START
1000
1002
OBTAIN POWER VIA ANTENNA
1004
OUTPUT VOLTAGE TO FIRST PINS COUPLED TO FIRST TERMINALS OF TEST AND/OR CONTROL ZONE(S)
1006
SENSE CURRENT/RESISTANCE CORRESPONDING TO THE FIRST TERMINALS
1008
NO
IS CURRENT FROM ONE OR MORE OF SECOND PINS MORE THAN THRESHOLD OR RESISTANCE LESS THAN THRESHOLD?
YES
1010
FLAG CORRESPONDING TEST ZONE(S) AND CONTROL ZONE(S) AS POSITIVE
1012
NO
IS CURRENT FROM ONE OR MORE OF SECOND PINS LESS THAN THRESHOLD OR RESISTANCE MORE THAN THRESHOLD?
YES
1014
FLAG CORRESPONDING TEST ZONE(S) AND CONTROL ZONE(S) AS NEGATIVE
1016
TRANSMIT AND/OR STORE RESULTS CORRESPONDING TO FLAGS
END

FIG. 10

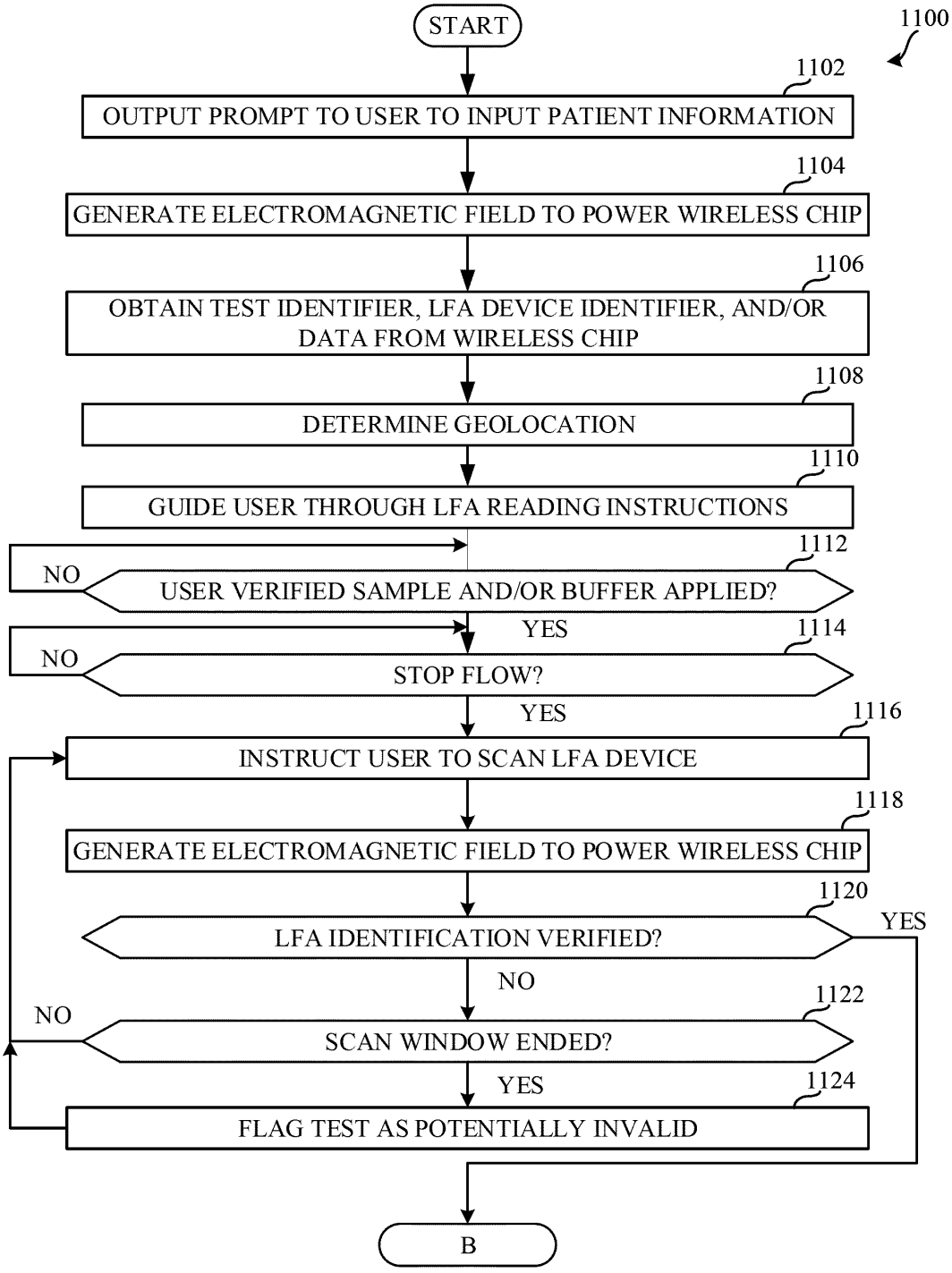

START
1100
1102
OUTPUT PROMPT TO USER TO INPUT PATIENT INFORMATION
1104
GENERATE ELECTROMAGNETIC FIELD TO POWER WIRELESS CHIP
1106
OBTAIN TEST IDENTIFIER, LFA DEVICE IDENTIFIER, AND/OR DATA FROM WIRELESS CHIP
1108
DETERMINE GEOLOCATION
1110
GUIDE USER THROUGH LFA READING INSTRUCTIONS
1112
NO
USER VERIFIED SAMPLE AND/OR BUFFER APPLIED?
YES
1114
NO
STOP FLOW?
YES
1116
INSTRUCT USER TO SCAN LFA DEVICE
1118
GENERATE ELECTROMAGNETIC FIELD TO POWER WIRELESS CHIP
1120
YES
LFA IDENTIFICATION VERIFIED?
NO
1122
NO
SCAN WINDOW ENDED?
YES
1124
FLAG TEST AS POTENTIALLY INVALID
B

FIG. 11A

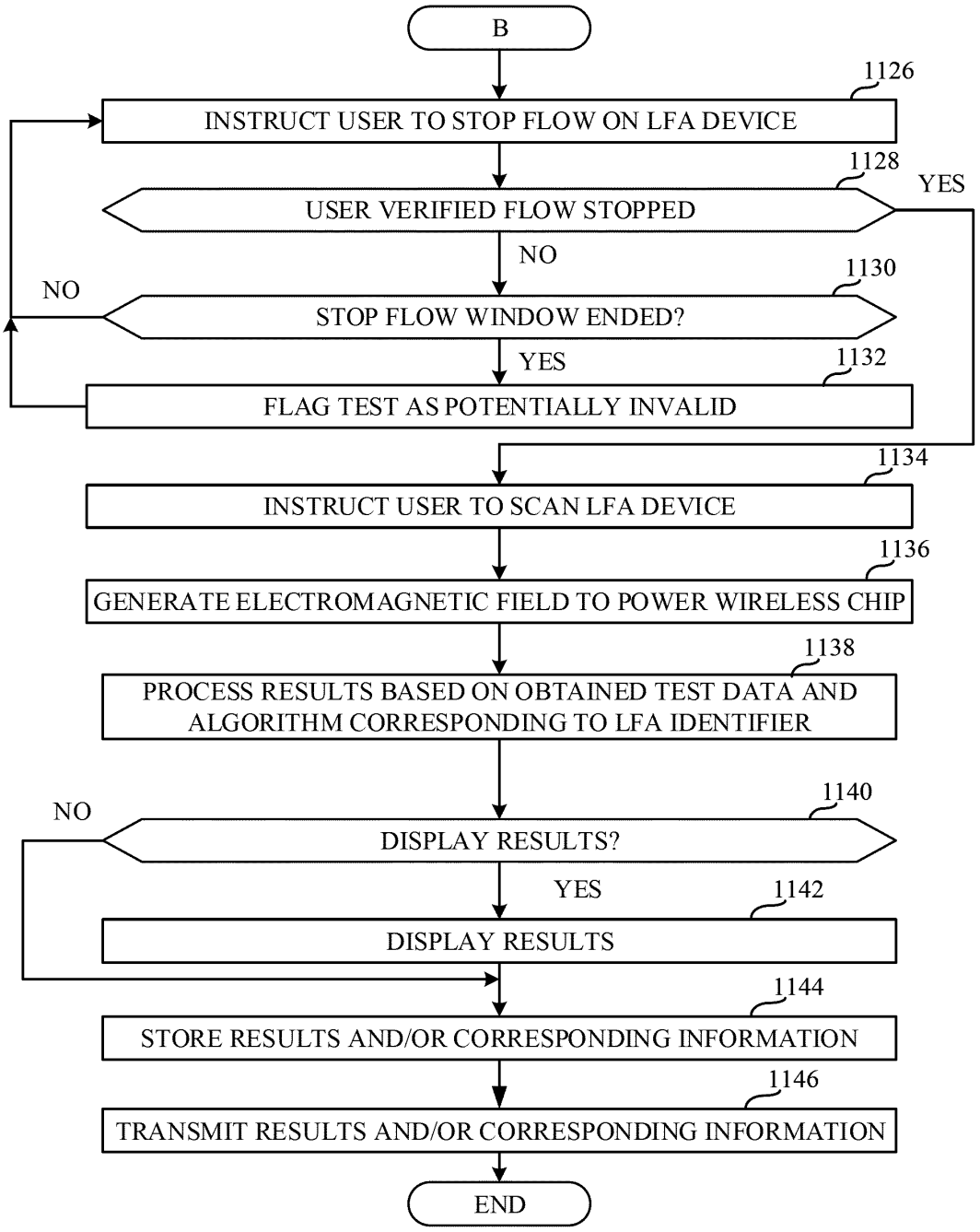

B
1126
INSTRUCT USER TO STOP FLOW ON LFA DEVICE
1128
USER VERIFIED FLOW STOPPED
YES
NO
1130
NO
STOP FLOW WINDOW ENDED?
YES
1132
FLAG TEST AS POTENTIALLY INVALID
1134
INSTRUCT USER TO SCAN LFA DEVICE
1136
GENERATE ELECTROMAGNETIC FIELD TO POWER WIRELESS CHIP
1138
PROCESS RESULTS BASED ON OBTAINED TEST DATA AND ALGORITHM CORRESPONDING TO LFA IDENTIFIER
1140
NO
DISPLAY RESULTS?
YES
1142
DISPLAY RESULTS
1144
STORE RESULTS AND/OR CORRESPONDING INFORMATION
1146
TRANSMIT RESULTS AND/OR CORRESPONDING INFORMATION
END

FIG. 11B

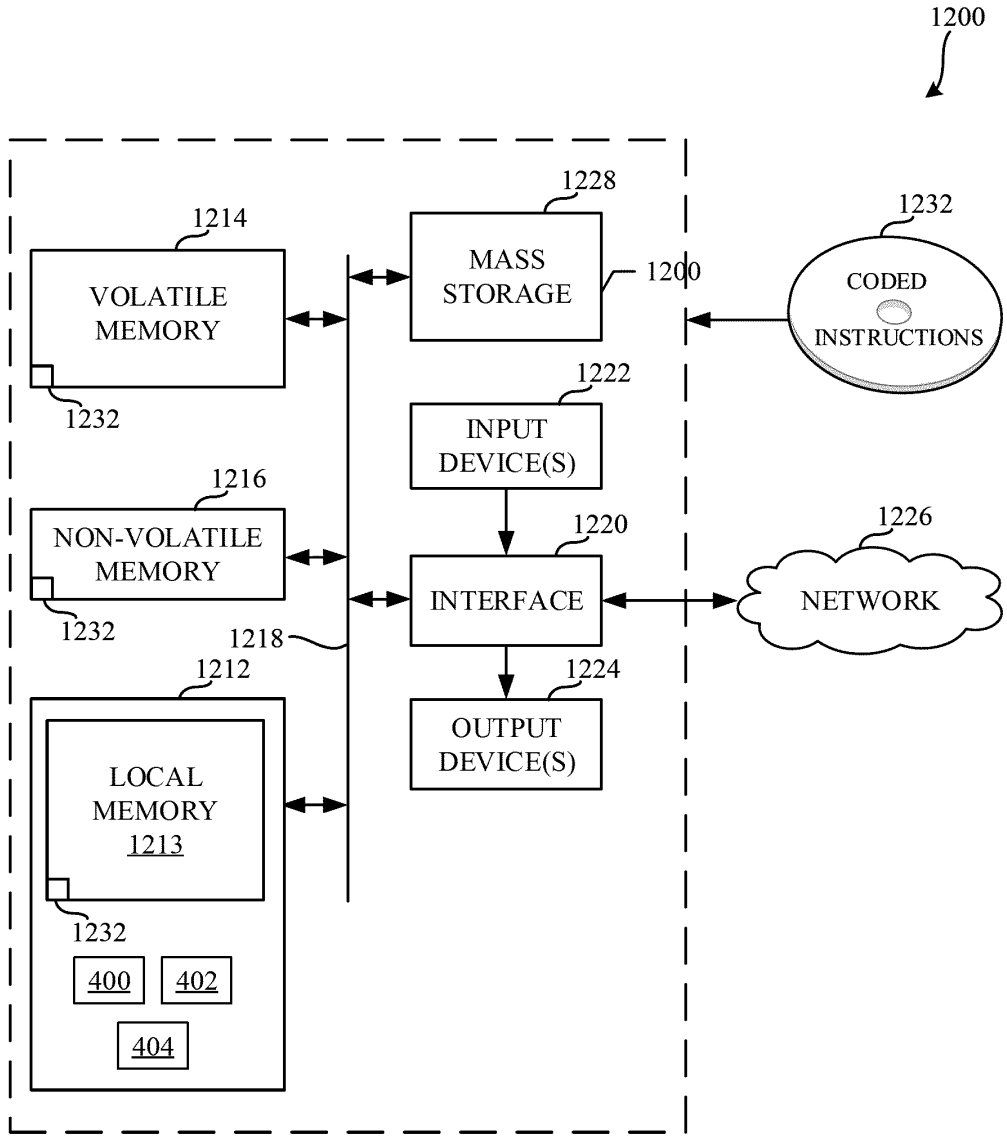

1200
1228
1214
MASS STORAGE
1200
1232
VOLATILE MEMORY
CODED INSTRUCTIONS
1232
1222
INPUT DEVICE(S)
1216
1220
1226
NON-VOLATILE MEMORY
INTERFACE
NETWORK
1232
1218
1212
1224
OUTPUT DEVICE(S)
LOCAL MEMORY 1213
1232
400
402
404

FIG. 12

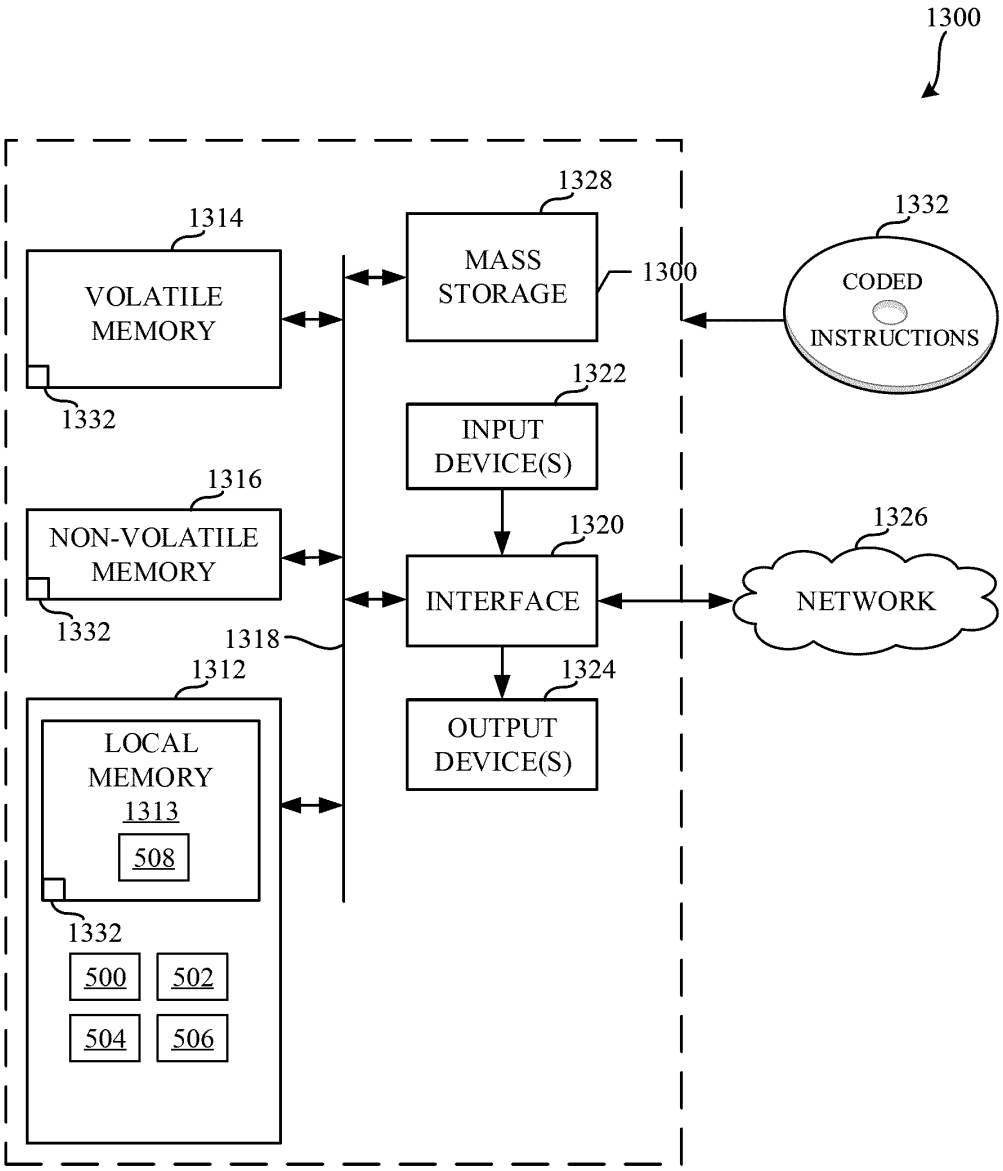

1300
1328
1314
MASS STORAGE
1300
1332
VOLATILE MEMORY
CODED INSTRUCTIONS
1332
1322
INPUT DEVICE(S)
1316
1320
1326
NON-VOLATILE MEMORY
INTERFACE
NETWORK
1332
1318
1312
1324
OUTPUT DEVICE(S)
LOCAL MEMORY 1313
508
1332
500
502
504
506

FIG. 13

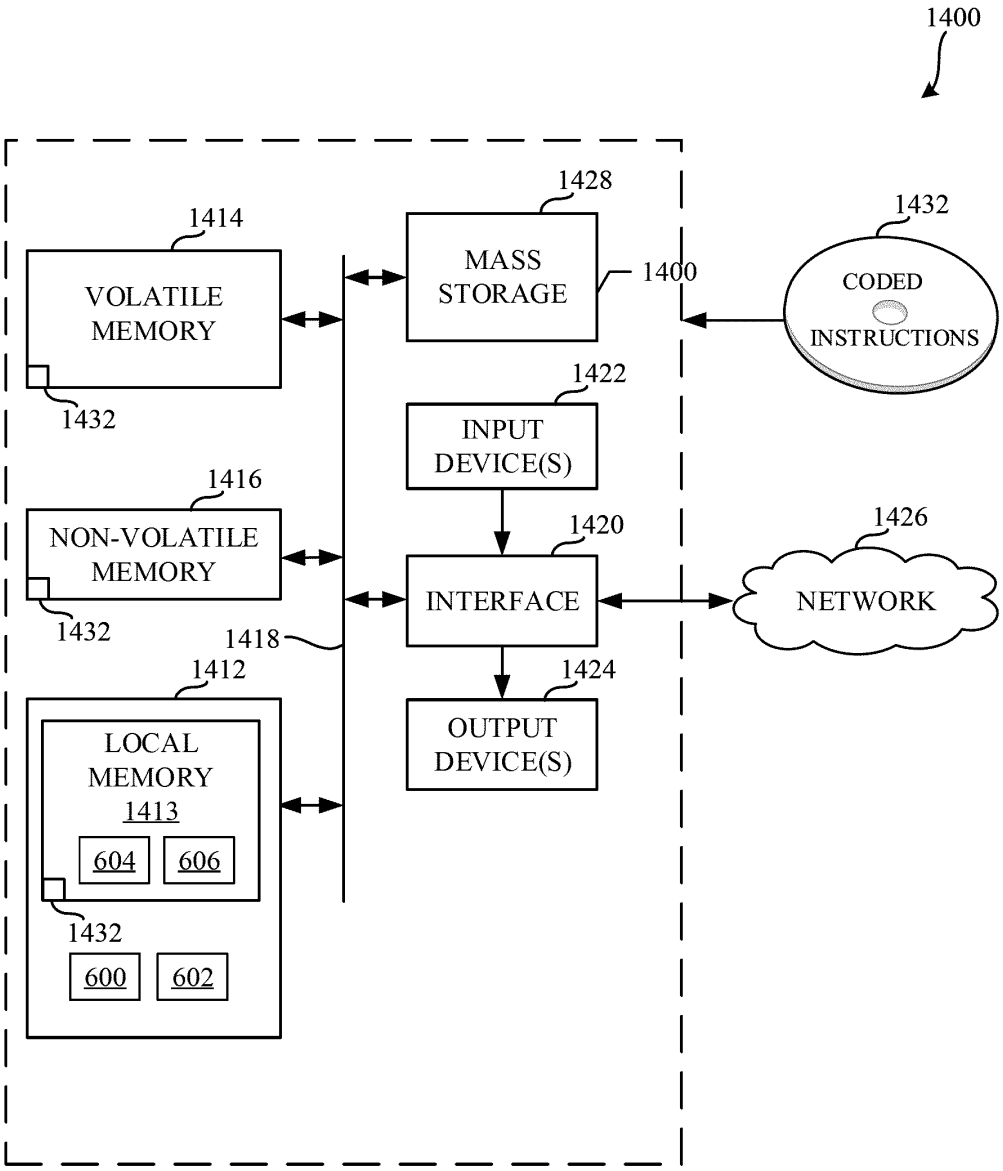

1400
1428
1414
MASS STORAGE
1400
1432
CODED INSTRUCTIONS
VOLATILE MEMORY
1432
1422
INPUT DEVICE(S)
1416
NON-VOLATILE MEMORY
1432
1420
1426
INTERFACE
NETWORK
1418
1412
1424
OUTPUT DEVICE(S)
LOCAL MEMORY 1413
604
606
1432
600
602

FIG. 14

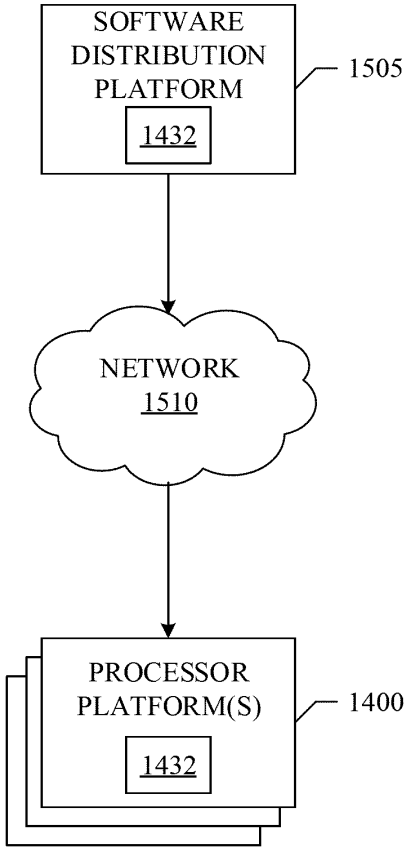

SOFTWARE DISTRIBUTION PLATFORM
1432
1505
NETWORK
1510
PROCESSOR PLATFORM(S)
1432
1400

FIG. 15