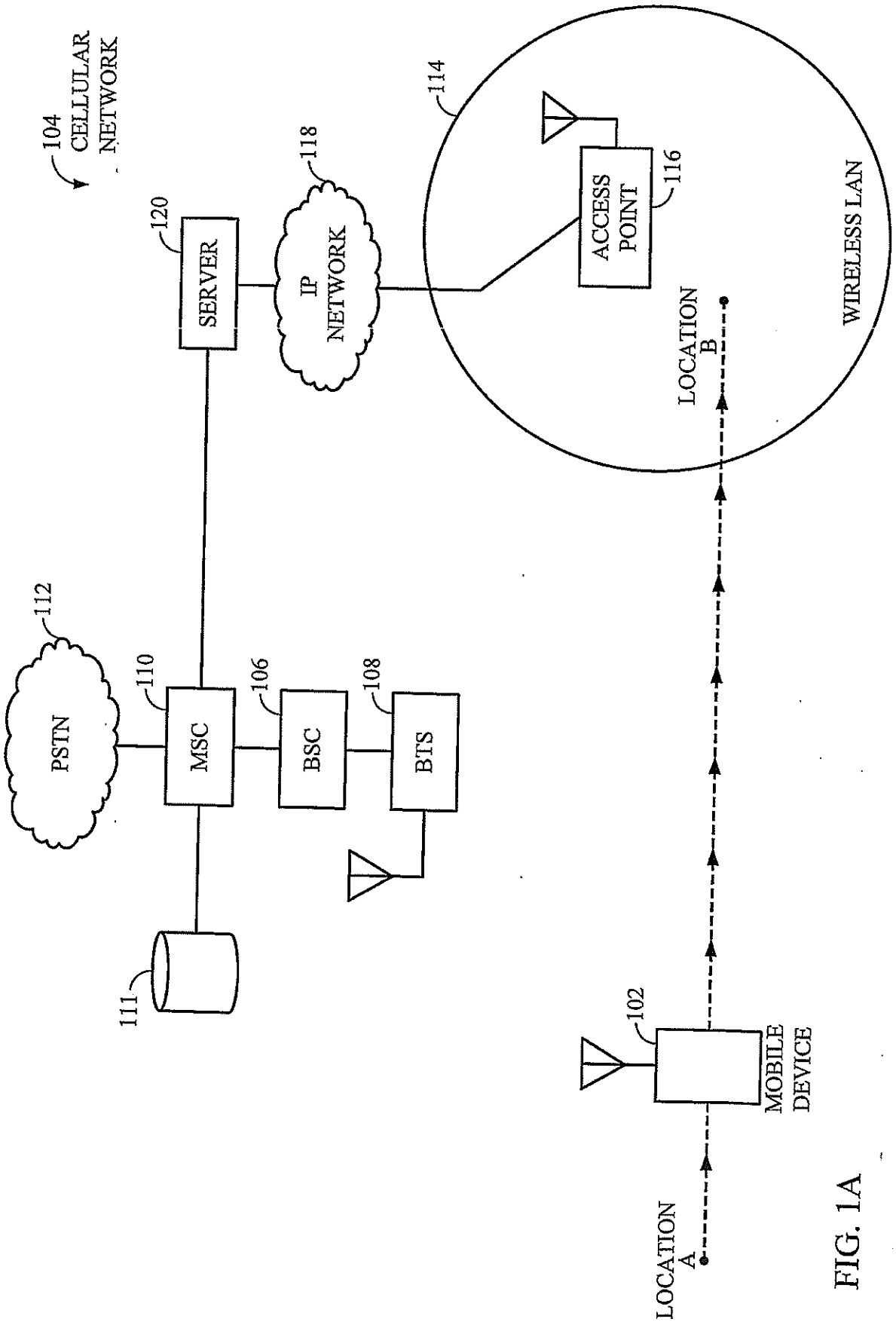

104
CELLULAR
NETWORK
120
SERVER
118
IP
NETWORK
114
ACCESS
POINT
116
WIRELESS LAN
LOCATION
B
112
PSTN
110
MSC
106
BSC
108
BTS
111
102
MOBILE
DEVICE
LOCATION
A

FIG. 1A

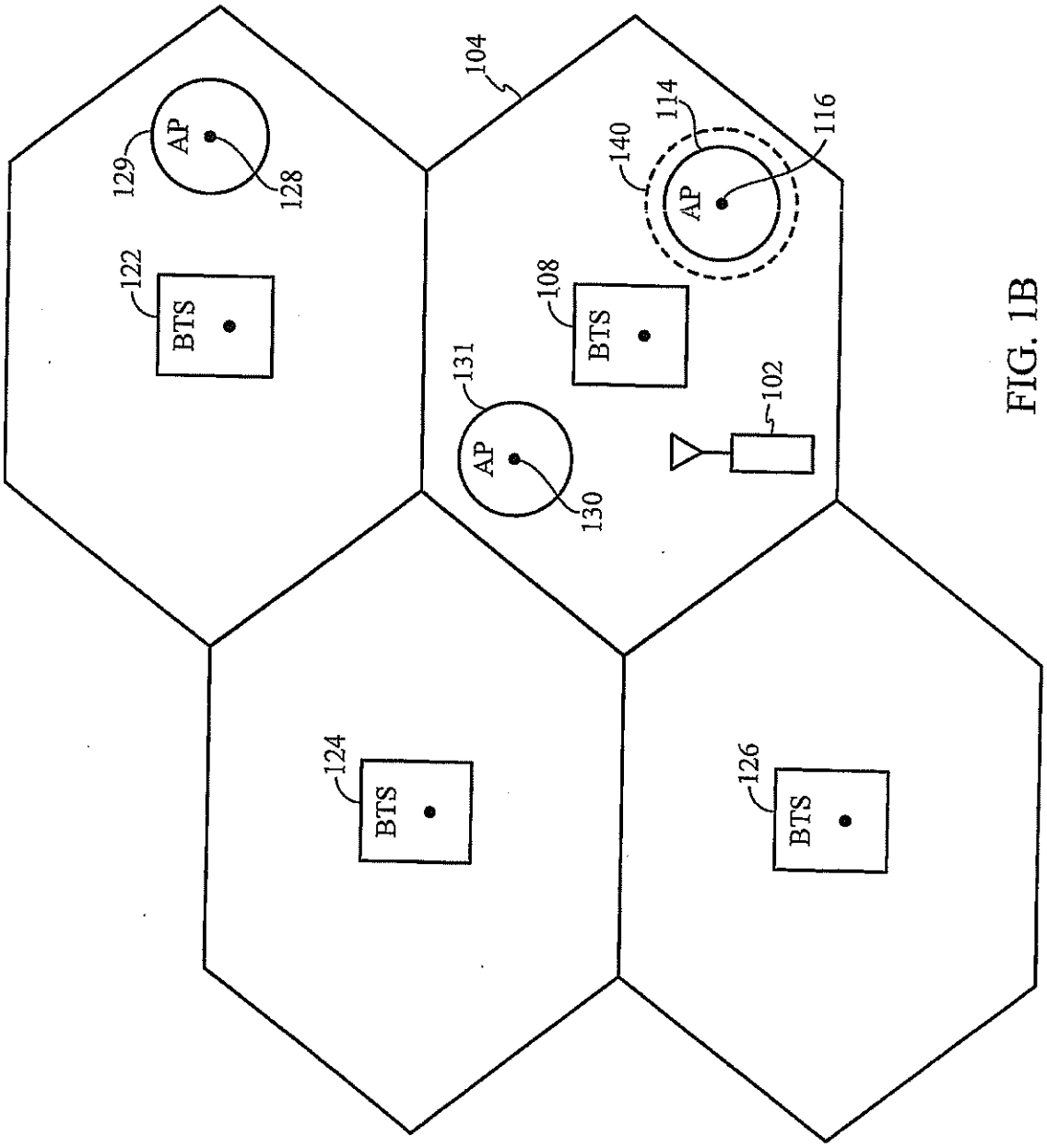

104
129
AP
128
122
BTS
140
114
116
AP
108
BTS
131
AP
130
102
124
BTS
126
BTS

FIG. 1B

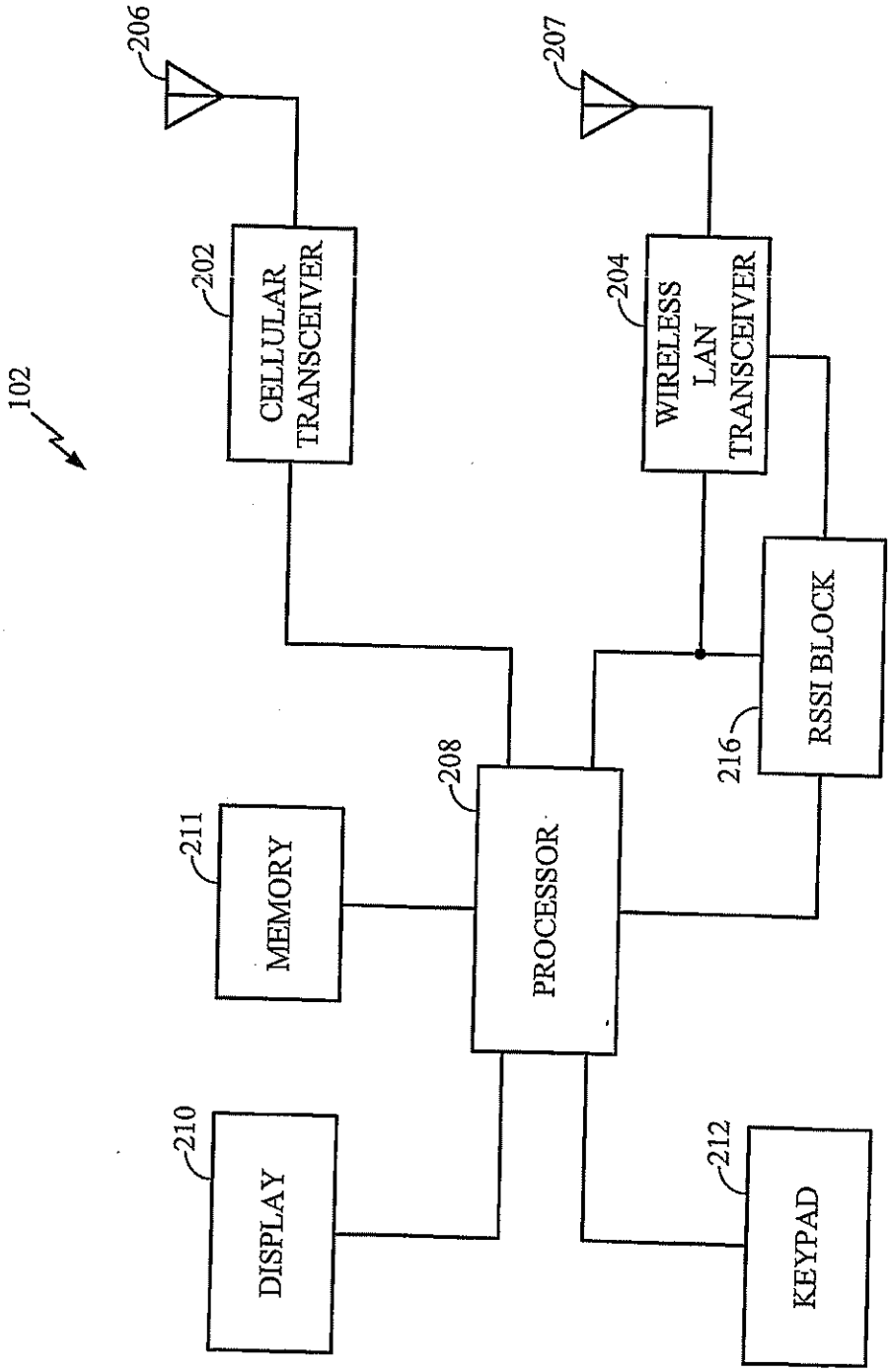

102
206
207
202
CELLULAR TRANSCEIVER
204
WIRELESS LAN TRANSCEIVER
RSSI BLOCK
216
208
PROCESSOR
211
MEMORY
210
DISPLAY
212
KEYPAD

FIG. 2

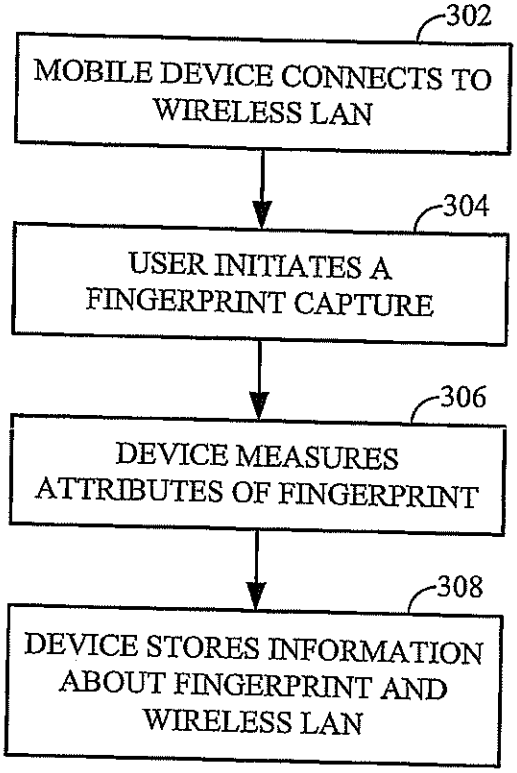

302
MOBILE DEVICE CONNECTS TO WIRELESS LAN
304
USER INITIATES A FINGERPRINT CAPTURE
306
DEVICE MEASURES ATTRIBUTES OF FINGERPRINT
308
DEVICE STORES INFORMATION ABOUT FINGERPRINT AND WIRELESS LAN

FIG. 3A

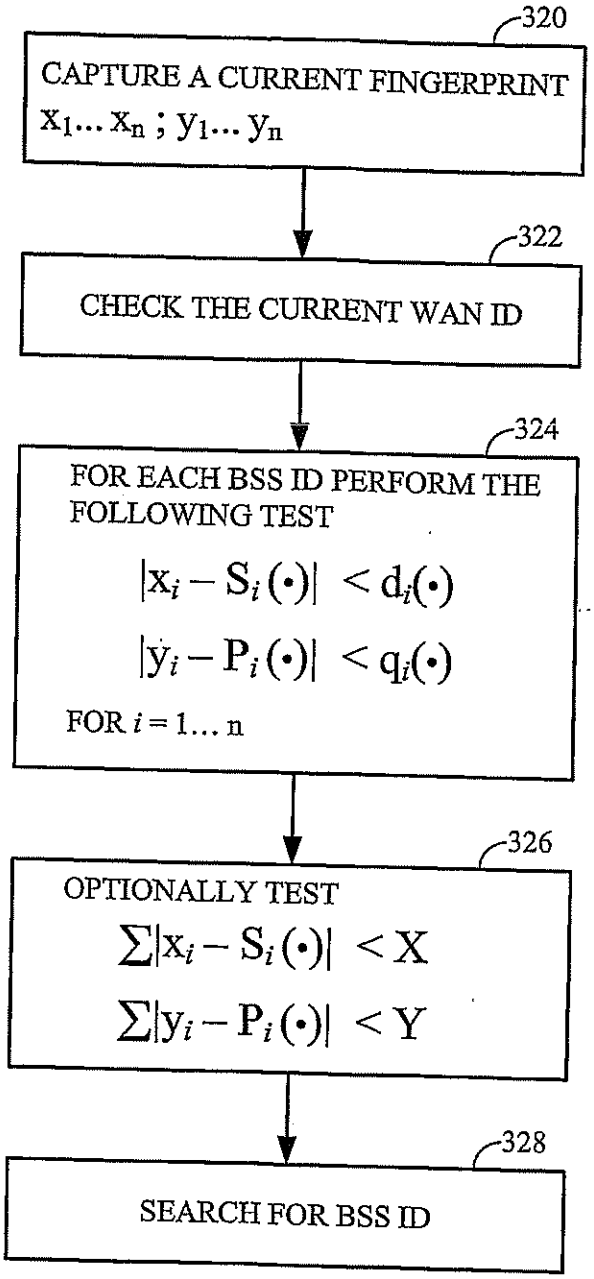

320
CAPTURE A CURRENT FINGERPRINT $x_1 \ldots x_n$; $y_1 \ldots y_n$
322
CHECK THE CURRENT WAN ID
324
FOR EACH BSS ID PERFORM THE FOLLOWING TEST
$|x_i - S_i(\cdot)| < d_i(\cdot)$
$|y_i - P_i(\cdot)| < q_i(\cdot)$
FOR $i = 1 \ldots n$
326
OPTIONALLY TEST
$\sum|x_i - S_i(\cdot)| < X$
$\sum|y_i - P_i(\cdot)| < Y$
328
SEARCH FOR BSS ID

FIG. 3B

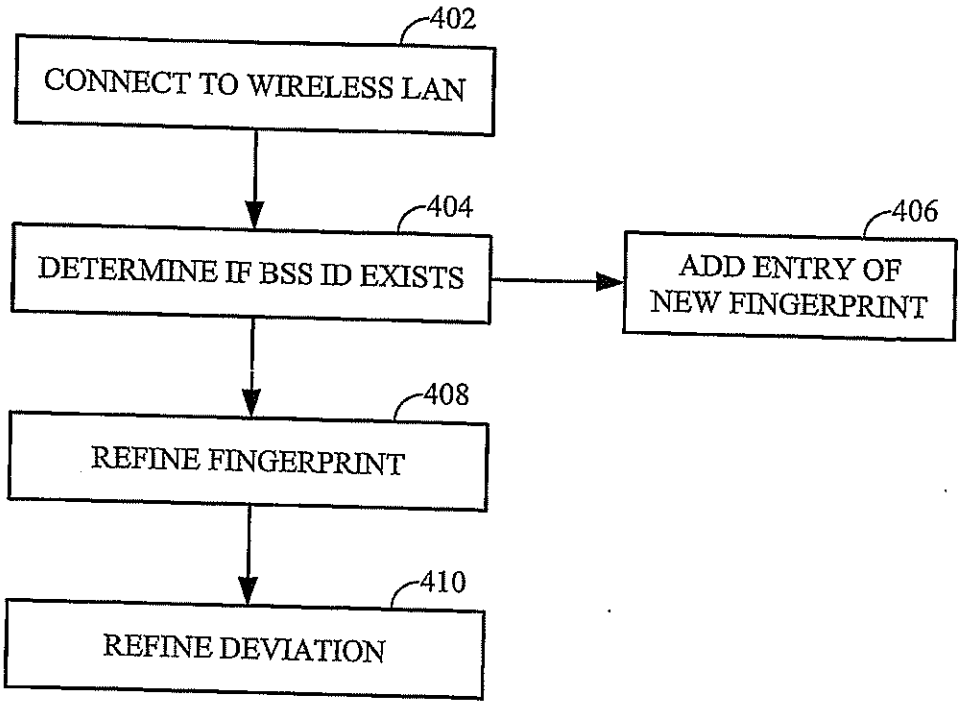

402
CONNECT TO WIRELESS LAN
404
DETERMINE IF BSS ID EXISTS
406
ADD ENTRY OF NEW FINGERPRINT
408
REFINE FINGERPRINT
410
REFINE DEVIATION

FIG. 4

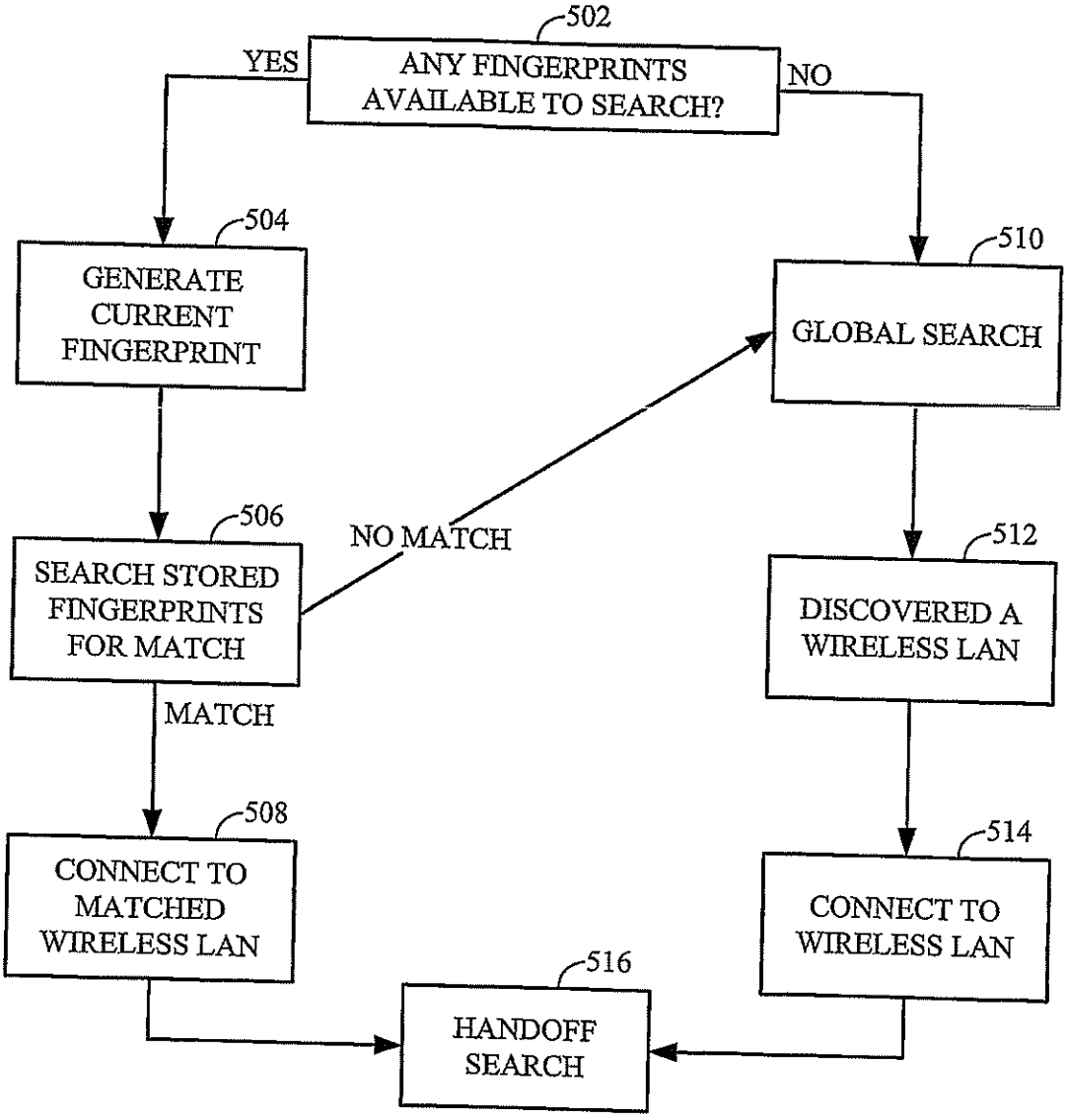

502
ANY FINGERPRINTS AVAILABLE TO SEARCH?
YES
NO
504
GENERATE CURRENT FINGERPRINT
510
GLOBAL SEARCH
506
SEARCH STORED FINGERPRINTS FOR MATCH
NO MATCH
512
DISCOVERED A WIRELESS LAN
MATCH
508
CONNECT TO MATCHED WIRELESS LAN
514
CONNECT TO WIRELESS LAN
516
HANDOFF SEARCH

FIG. 5

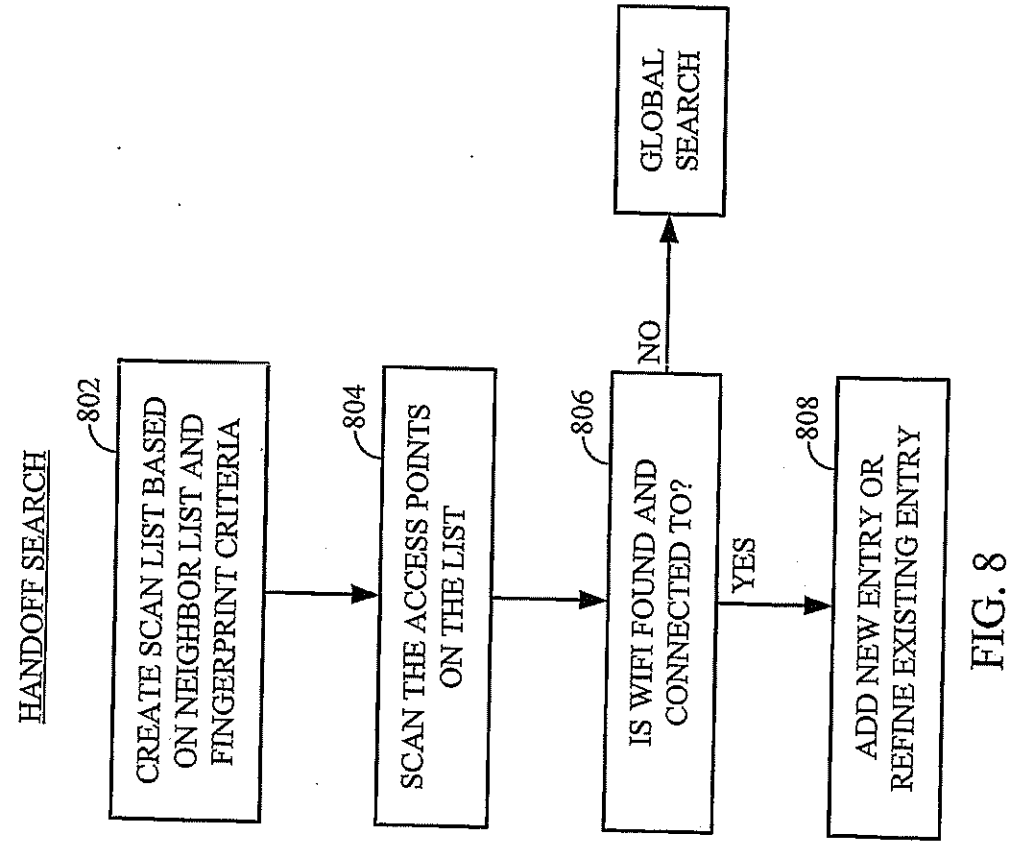

HANDOFF SEARCH
802
CREATE SCAN LIST BASED ON NEIGHBOR LIST AND FINGERPRINT CRITERIA
804
SCAN THE ACCESS POINTS ON THE LIST
806
IS WIFI FOUND AND CONNECTED TO?
NO
GLOBAL SEARCH
YES
808
ADD NEW ENTRY OR REFINE EXISTING ENTRY

FIG. 8

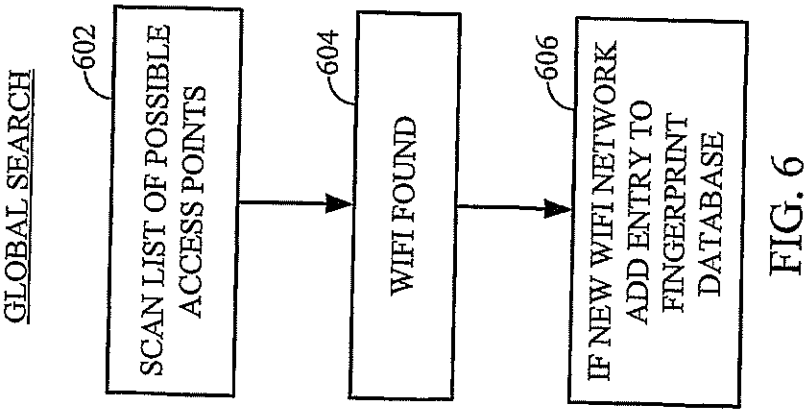

GLOBAL SEARCH
602
SCAN LIST OF POSSIBLE ACCESS POINTS
604
WIFI FOUND
606
IF NEW WIFI NETWORK ADD ENTRY TO FINGERPRINT DATABASE

FIG. 6

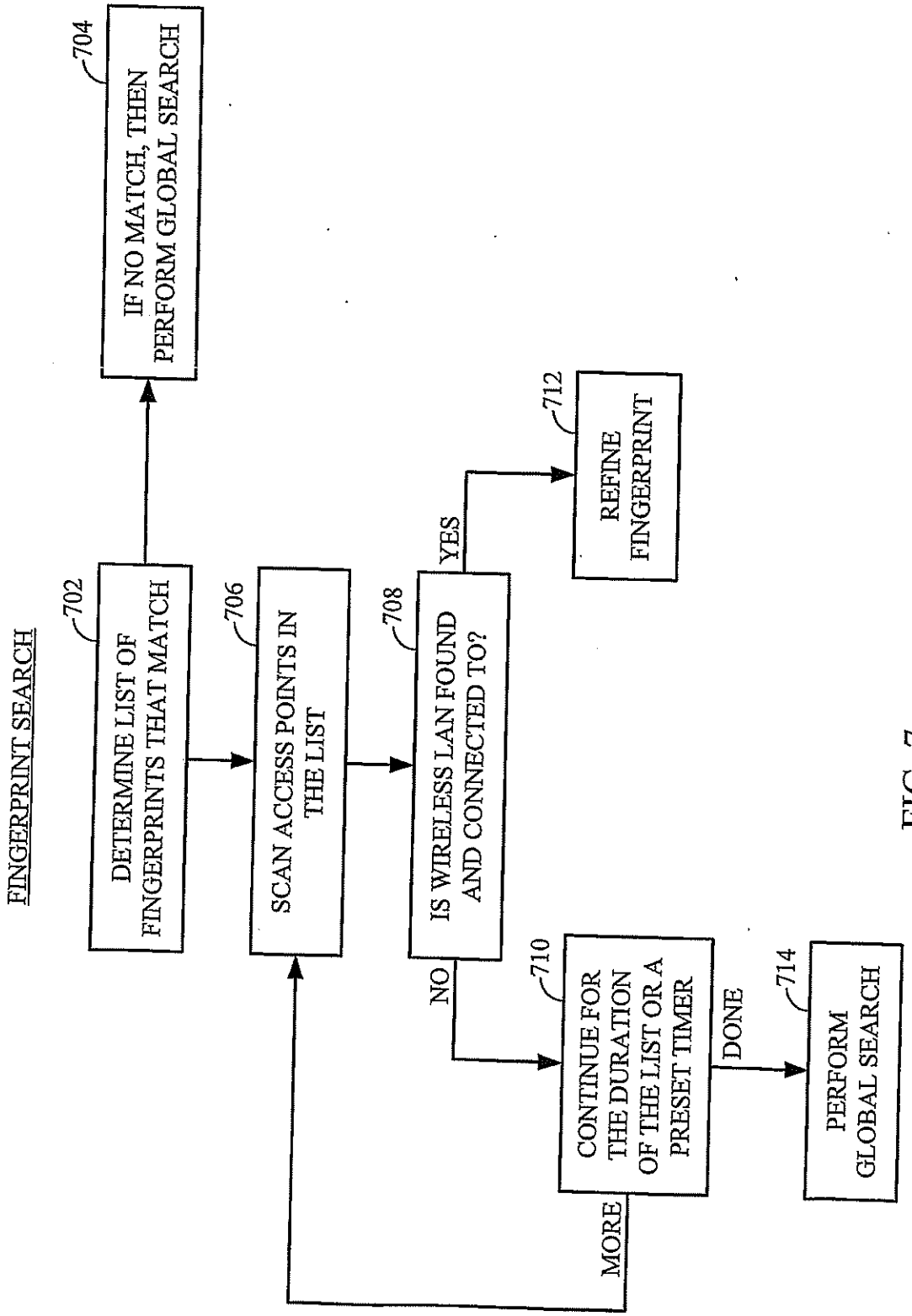

FINGERPRINT SEARCH
DETERMINE LIST OF FINGERPRINTS THAT MATCH
702
IF NO MATCH, THEN PERFORM GLOBAL SEARCH
704
SCAN ACCESS POINTS IN THE LIST
706
IS WIRELESS LAN FOUND AND CONNECTED TO?
708
YES
REFINE FINGERPRINT
712
NO
CONTINUE FOR THE DURATION OF THE LIST OR A PRESET TIMER
710
DONE
PERFORM GLOBAL SEARCH
714
MORE

FIG. 7