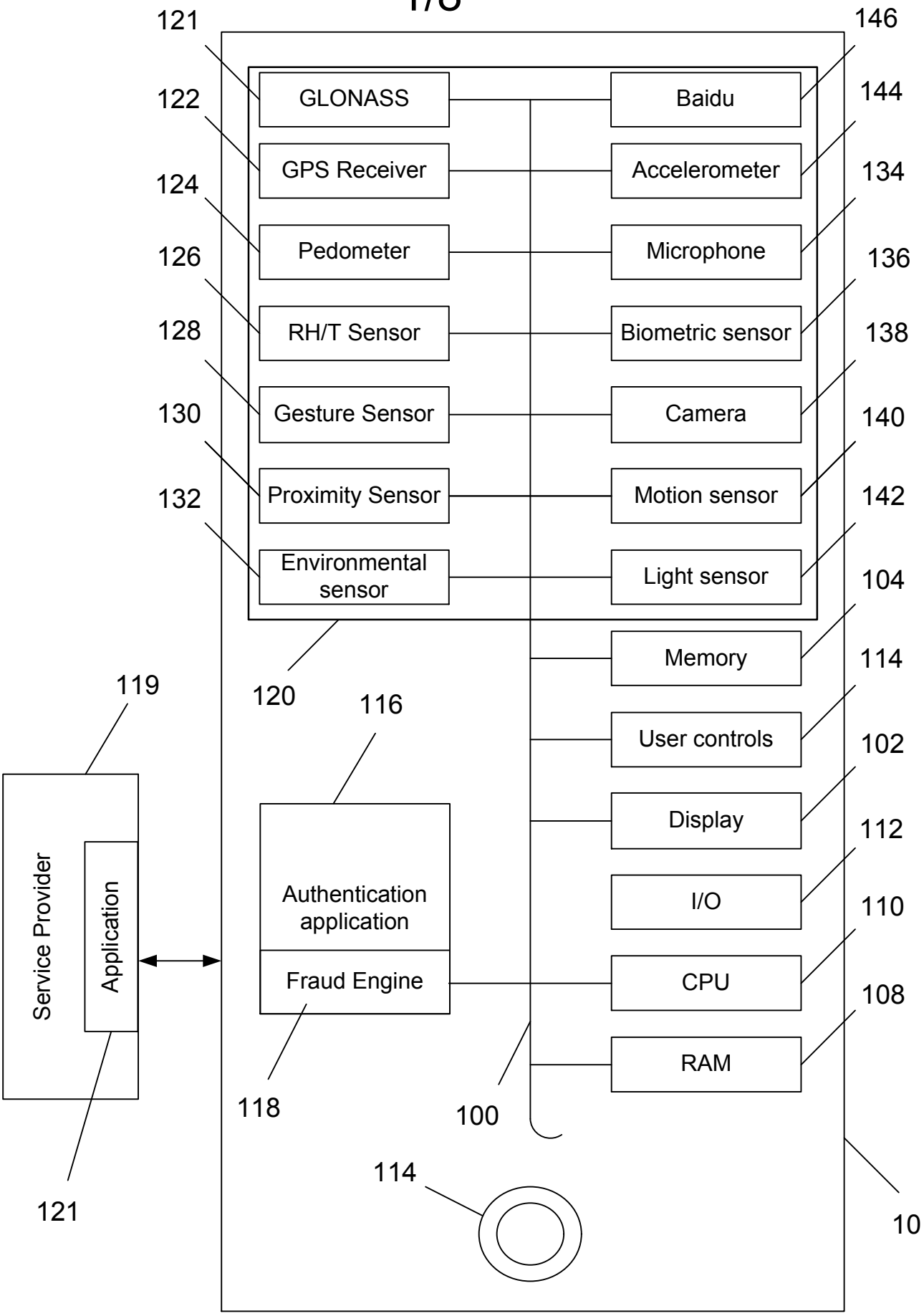

121
GLONASS
122
GPS Receiver
124
Pedometer
126
RH/T Sensor
128
Gesture Sensor
130
Proximity Sensor
132
Environmental sensor
120
146
Baidu
144
Accelerometer
134
Microphone
136
Biometric sensor
138
Camera
140
Motion sensor
142
Light sensor
104
Memory
114
User controls
102
Display
112
I/O
110
CPU
108
RAM
100
114
10
119
Service Provider
Application
121
116
Authentication application
Fraud Engine
118

Figure 1a

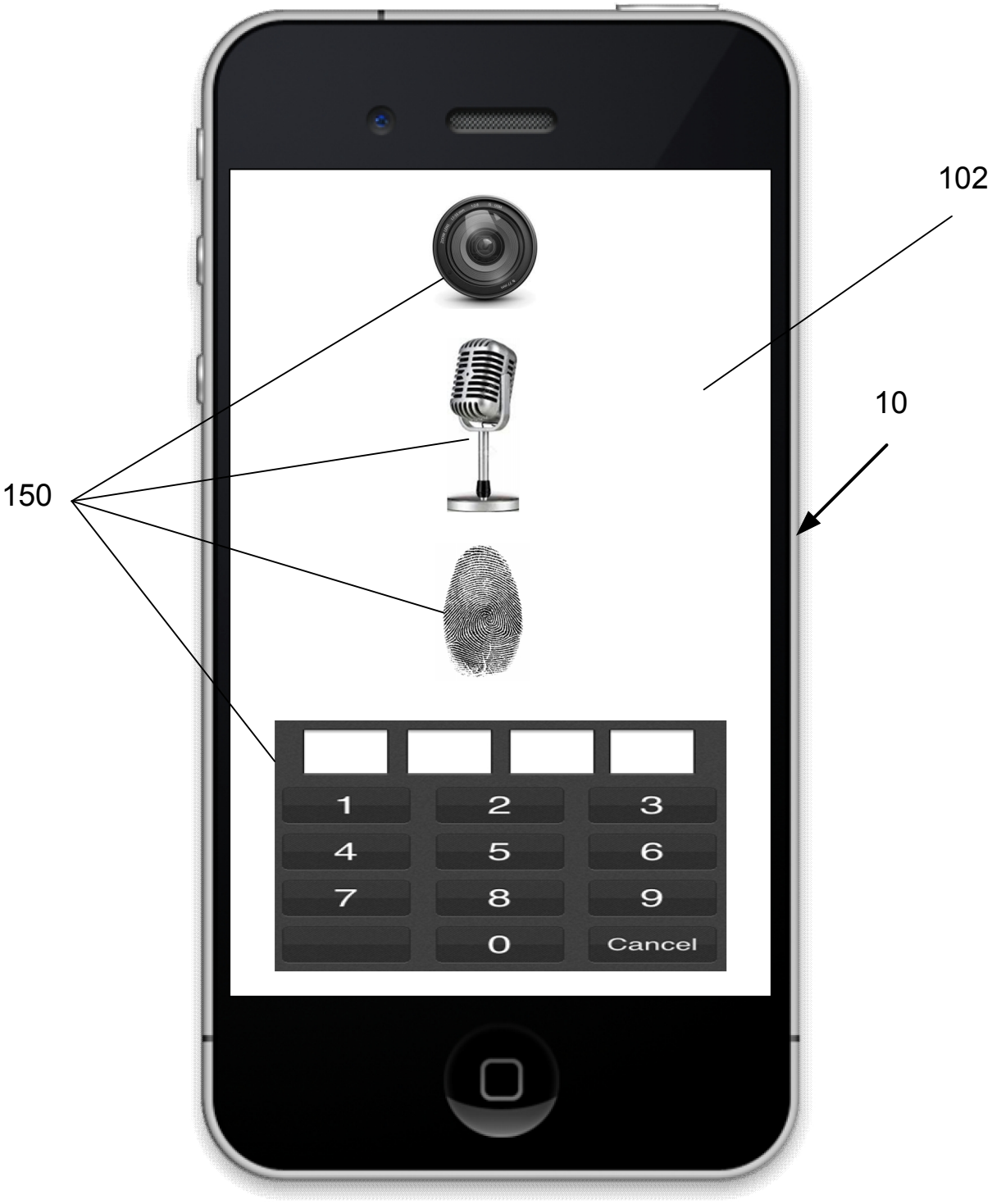


Figure 1b

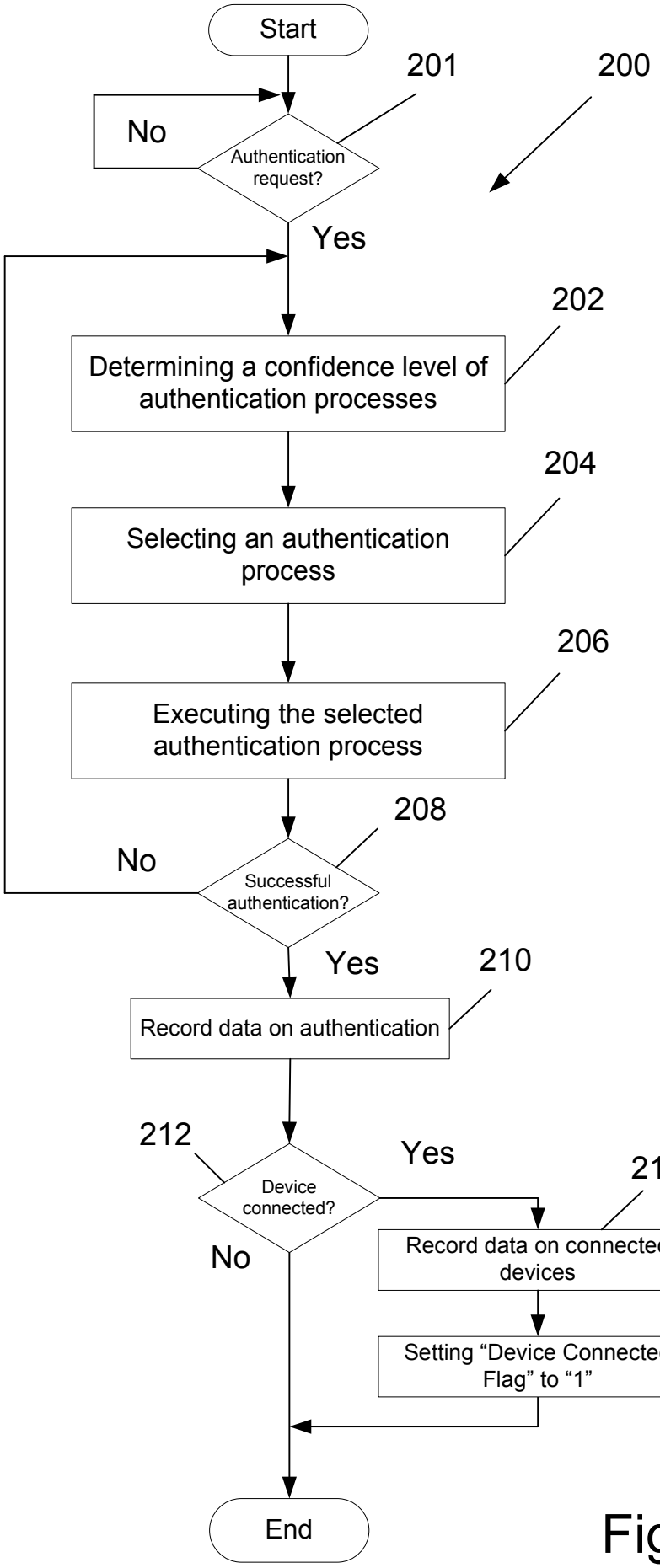

Start
201
200
No
Authentication request?
Yes
202
Determining a confidence level of authentication processes
204
Selecting an authentication process
206
Executing the selected authentication process
208
No
Successful authentication?
Yes
210
Record data on authentication
212
Device connected?
Yes
214
Record data on connected devices
No
216
Setting “Device Connected Flag” to “1”
End

Figure 2

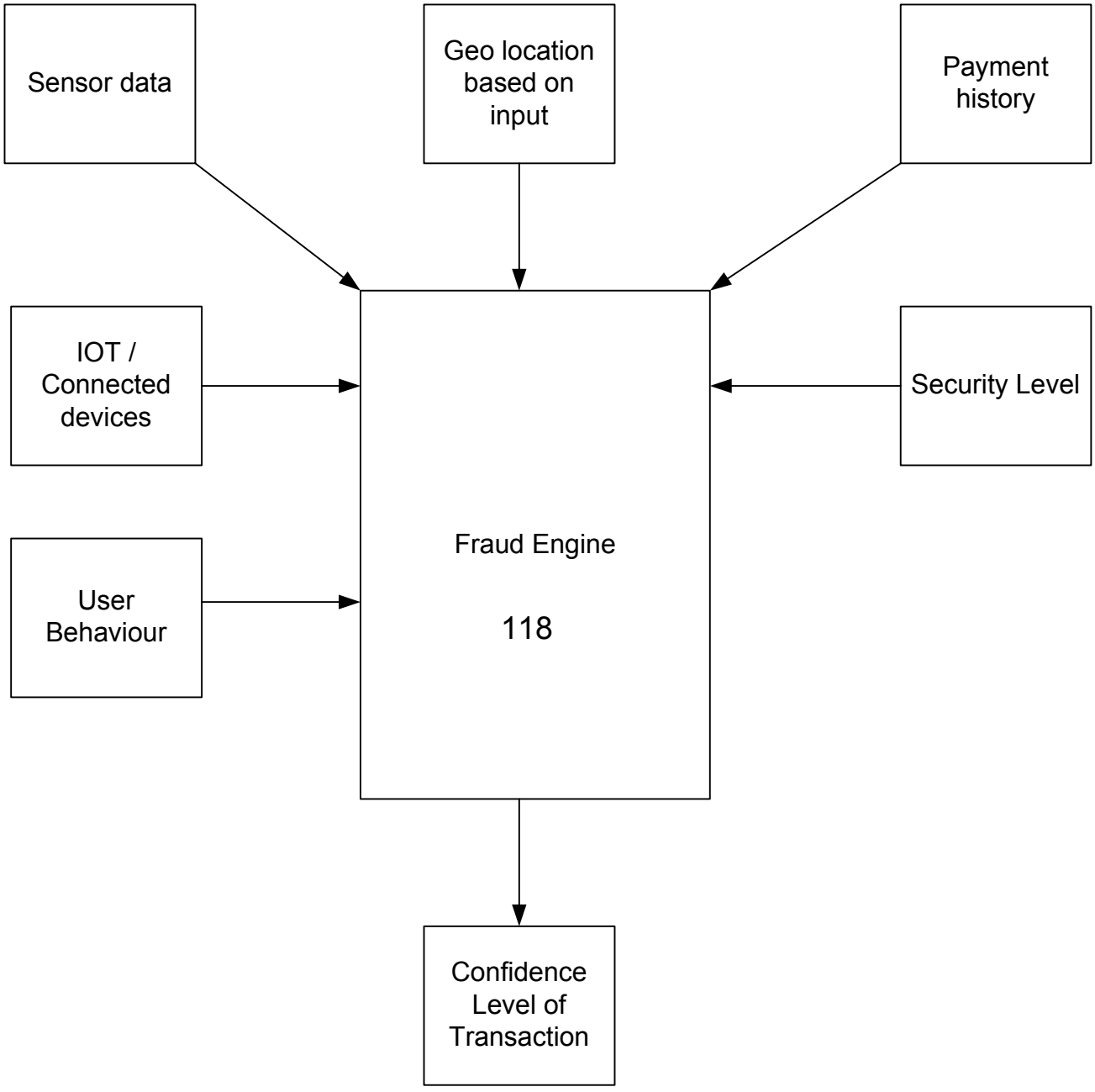

Sensor data
Geo location based on input
Payment history
IOT / Connected devices
Security Level
Fraud Engine
118
User Behaviour
Confidence Level of Transaction

Figure 3

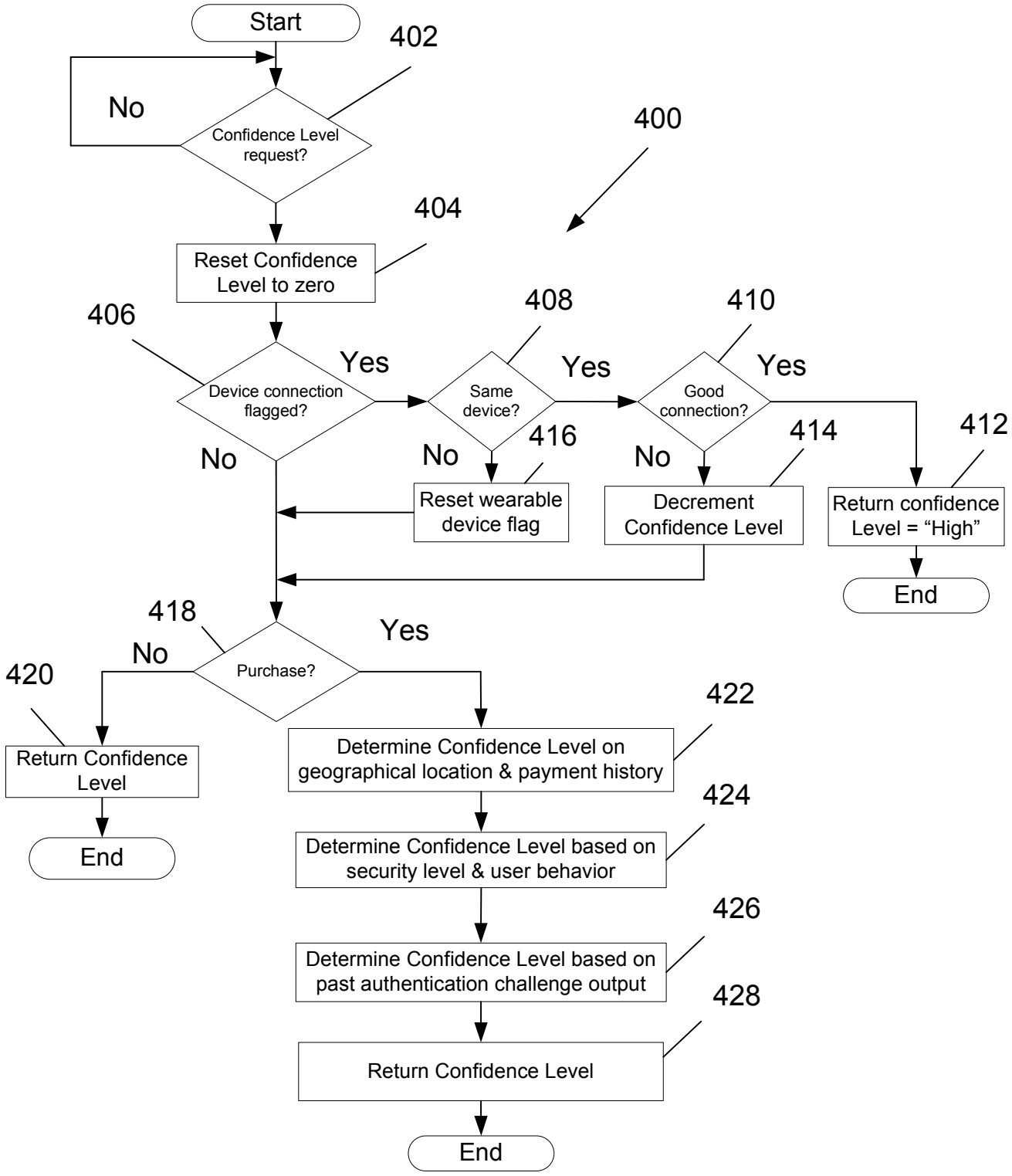

Start
402
No
Confidence Level request?
400
404
Reset Confidence Level to zero
406
408
410
Device connection flagged?
Yes
Same device?
Yes
Good connection?
Yes
No
416
No
414
No
412
Reset wearable device flag
Decrement Confidence Level
Return confidence Level = "High"
End
418
Yes
No
Purchase?
420
422
Return Confidence Level
Determine Confidence Level on geographical location & payment history
End
424
Determine Confidence Level based on security level & user behavior
426
Determine Confidence Level based on past authentication challenge output
428
Return Confidence Level
End

Figure 4

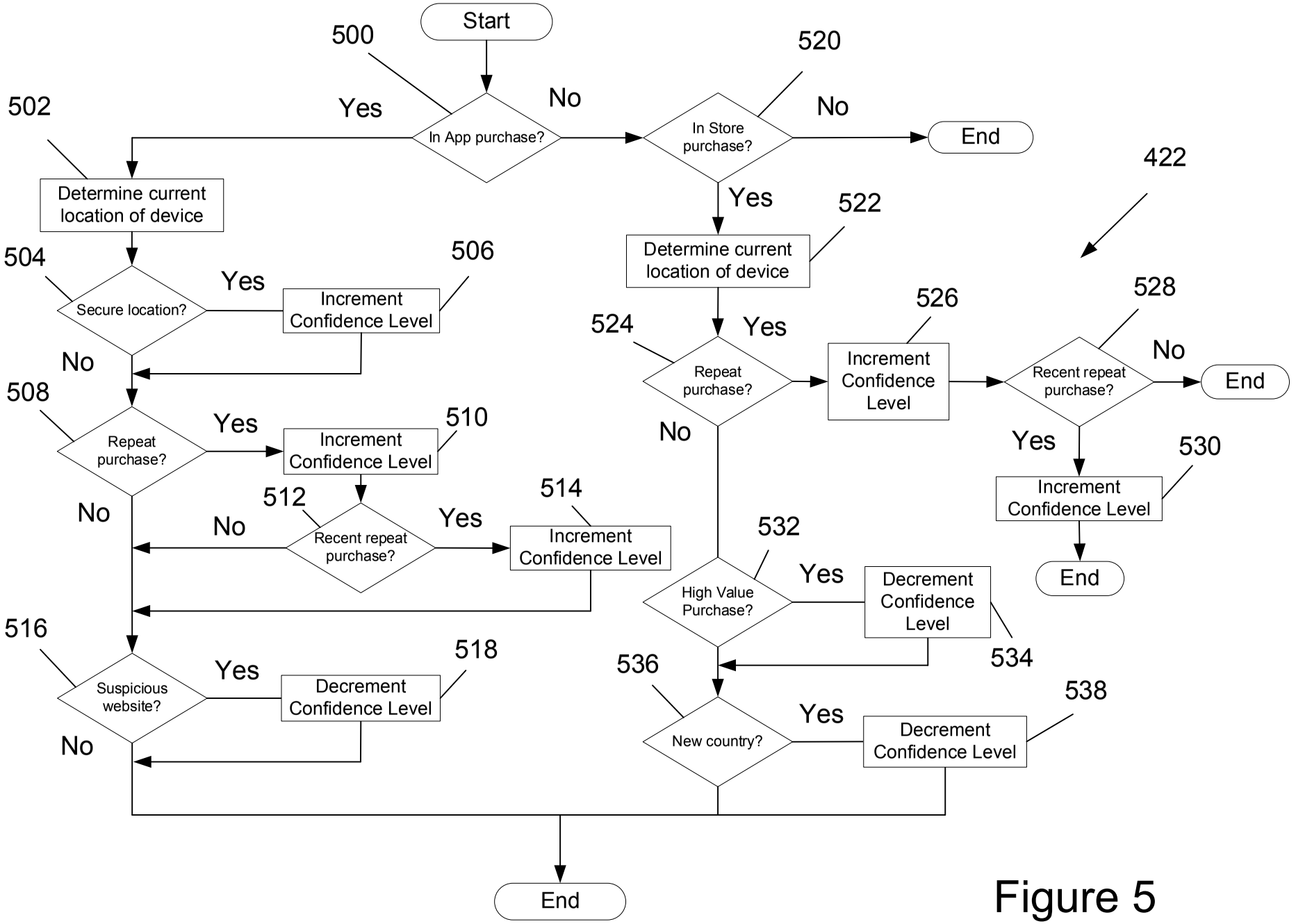

Start
500
In App purchase?
Yes
No
502
Determine current location of device
504
Secure location?
Yes
506
Increment Confidence Level
No
508
Repeat purchase?
Yes
510
Increment Confidence Level
No
512
Recent repeat purchase?
No
Yes
514
Increment Confidence Level
516
Suspicious website?
Yes
518
Decrement Confidence Level
No
End
520
In Store purchase?
No
End
Yes
522
Determine current location of device
422
524
Repeat purchase?
Yes
526
Increment Confidence Level
528
Recent repeat purchase?
No
End
Yes
530
Increment Confidence Level
End
No
532
High Value Purchase?
Yes
Decrement Confidence Level
534
536
New country?
Yes
538
Decrement Confidence Level
End

Figure 5

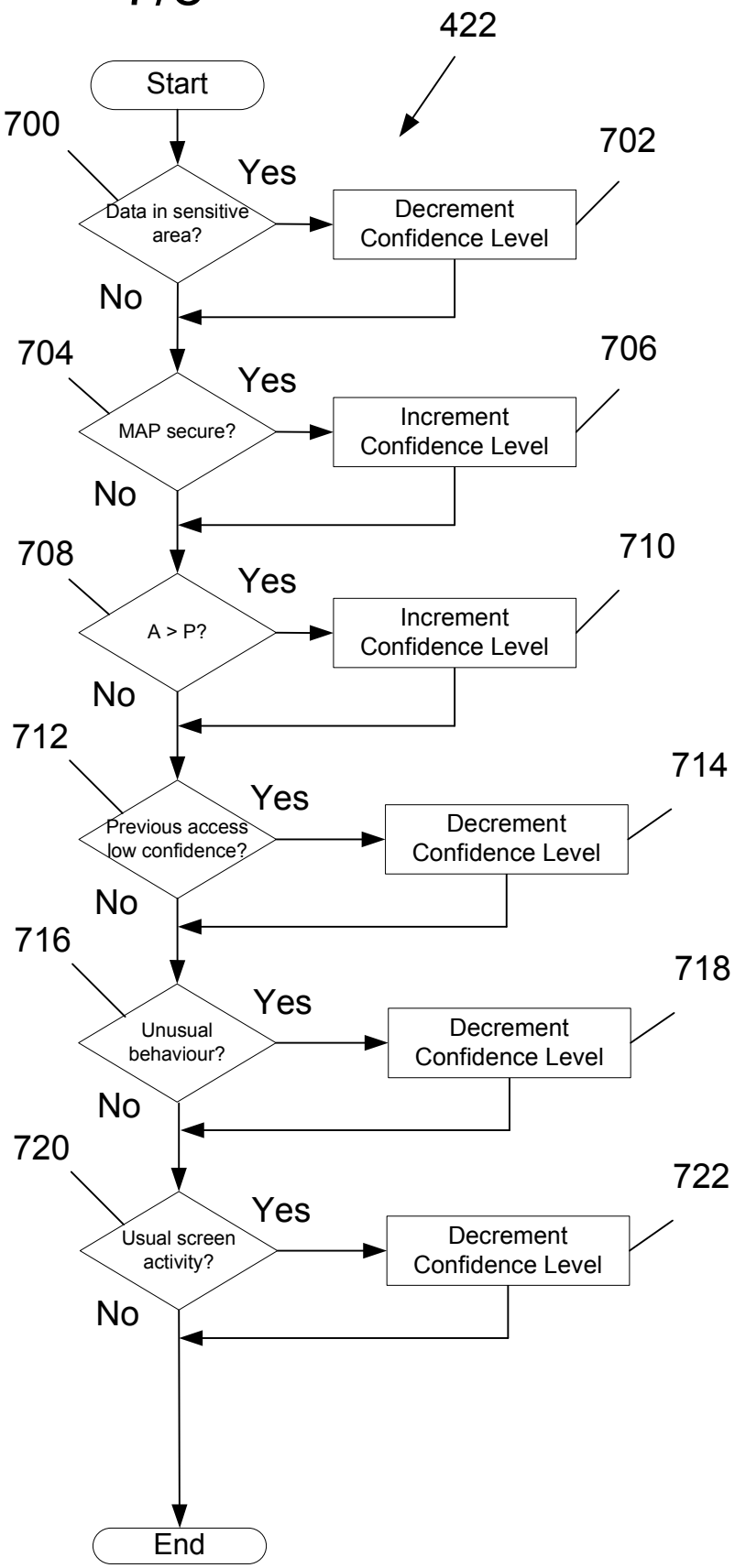

422
Start
700
Data in sensitive area?
Yes
No
702
Decrement Confidence Level
704
MAP secure?
Yes
No
706
Increment Confidence Level
708
A > P?
Yes
No
710
Increment Confidence Level
712
Previous access low confidence?
Yes
No
714
Decrement Confidence Level
716
Unusual behaviour?
Yes
No
718
Decrement Confidence Level
720
Usual screen activity?
Yes
No
722
Decrement Confidence Level
End

Figure 6

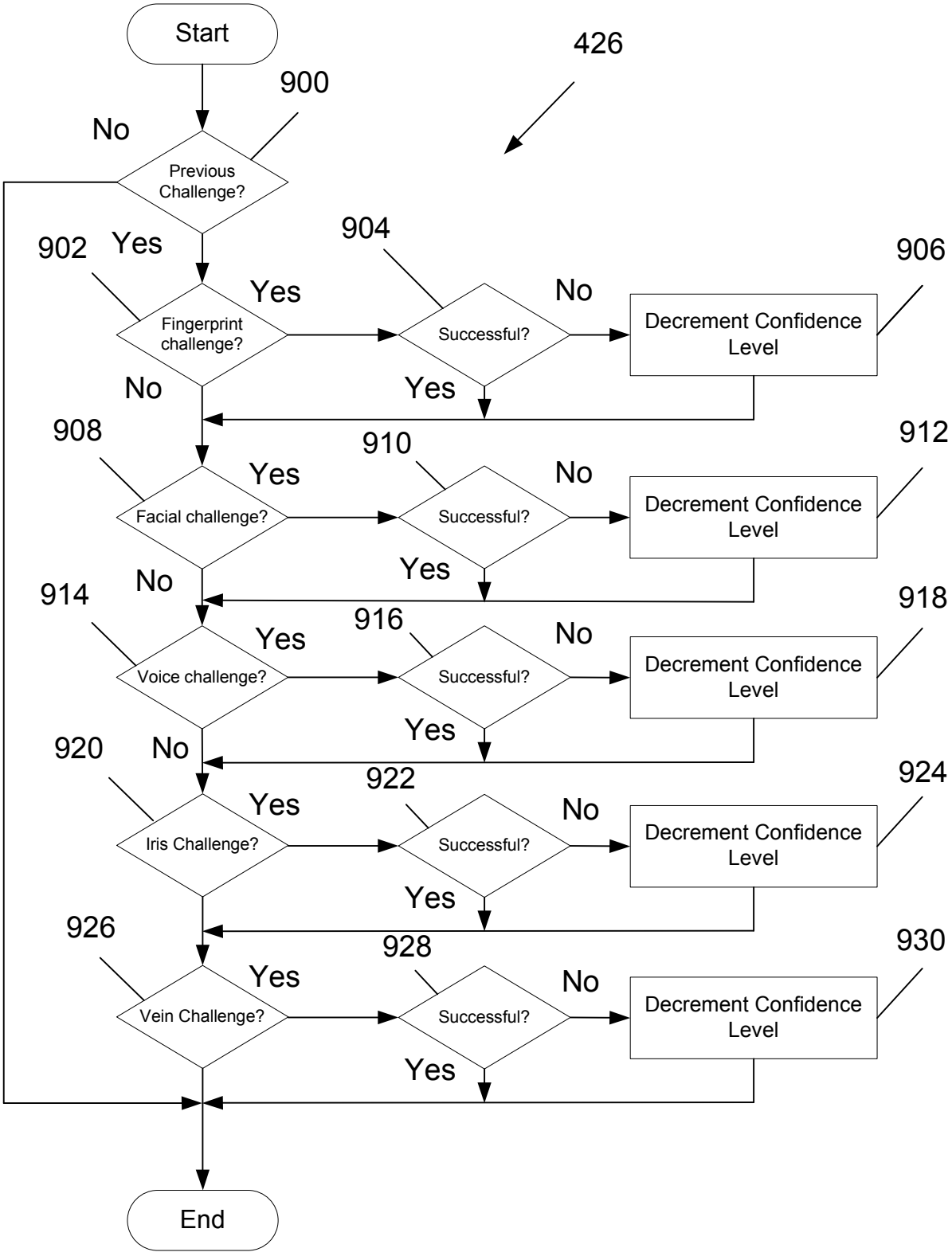

Start
426
900
No
Previous Challenge?
902
Yes
904
Yes
Fingerprint challenge?
Successful?
No
906
Decrement Confidence Level
No
Yes
908
910
912
Yes
Facial challenge?
Successful?
No
Decrement Confidence Level
Yes
No
914
916
918
Yes
Voice challenge?
Successful?
No
Decrement Confidence Level
Yes
920
No
922
924
Yes
Iris Challenge?
Successful?
No
Decrement Confidence Level
Yes
926
928
930
Yes
Vein Challenge?
Successful?
No
Decrement Confidence Level
Yes
End

Figure 7