FIG. 1

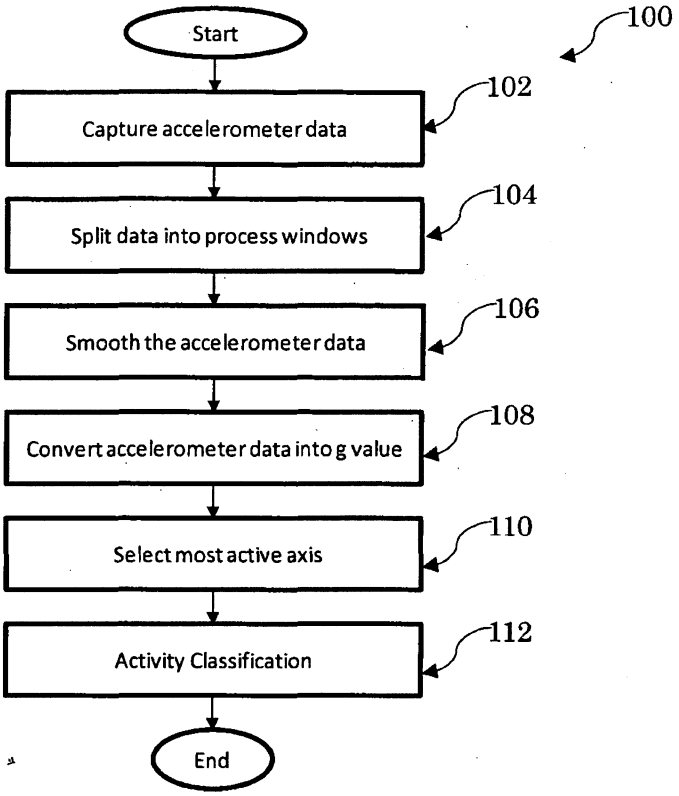

Start
100
Capture accelerometer data
102
Split data into process windows
104
Smooth the accelerometer data
106
Convert accelerometer data into g value
108
Select most active axis
110
Activity Classification
112
End

FIG. 2

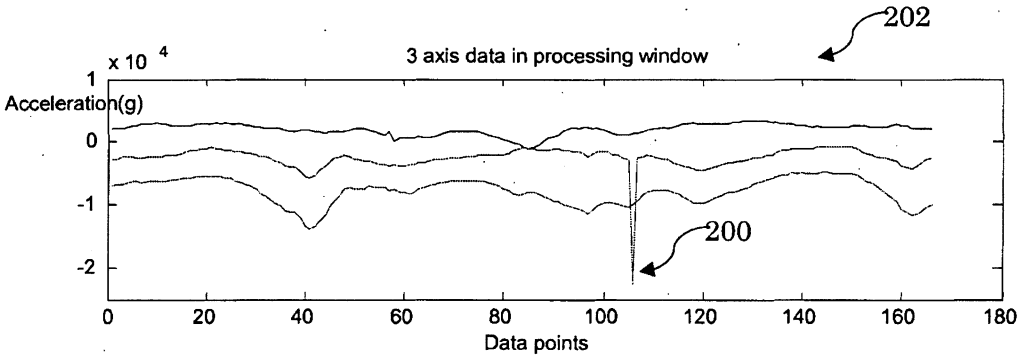

202
3 axis data in processing window
x 10 4
Acceleration(g)
1
0
-1
-2
200
0
20
40
60
80
100
120
140
160
180
Data points

FIG. 3

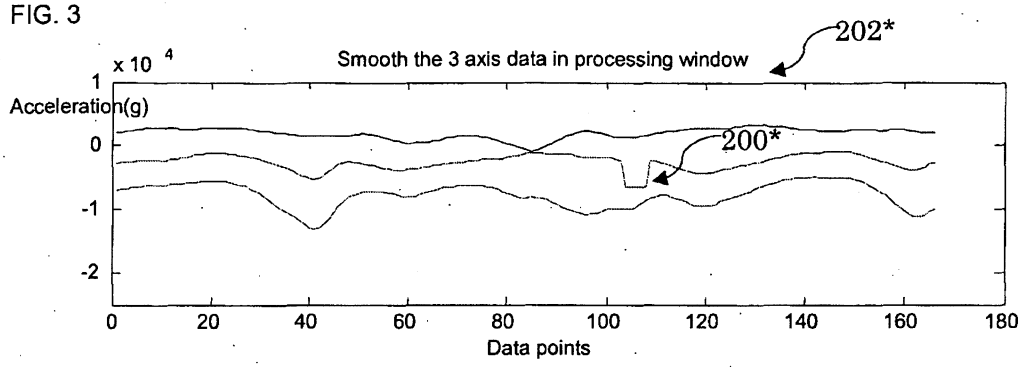


FIG. 4

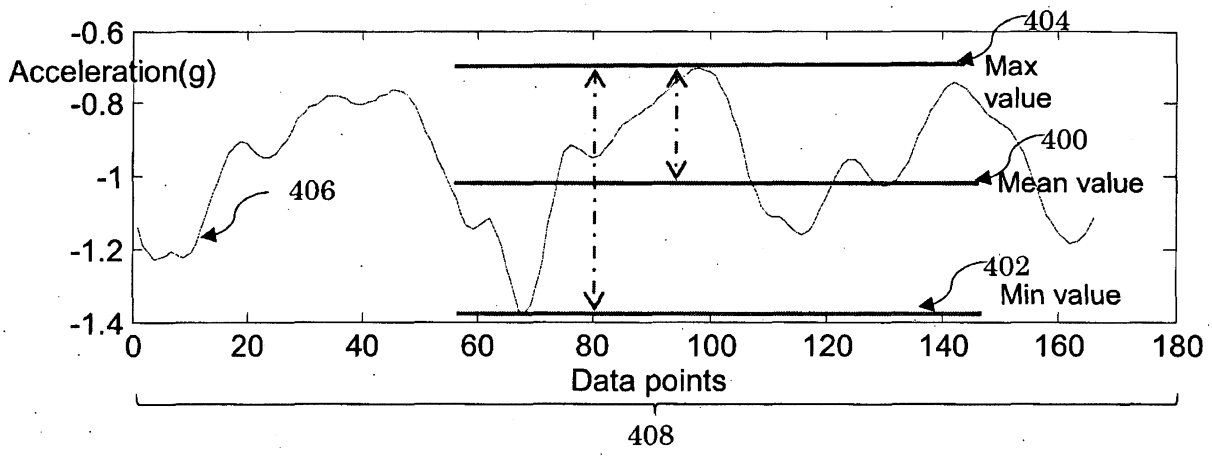


FIG. 5

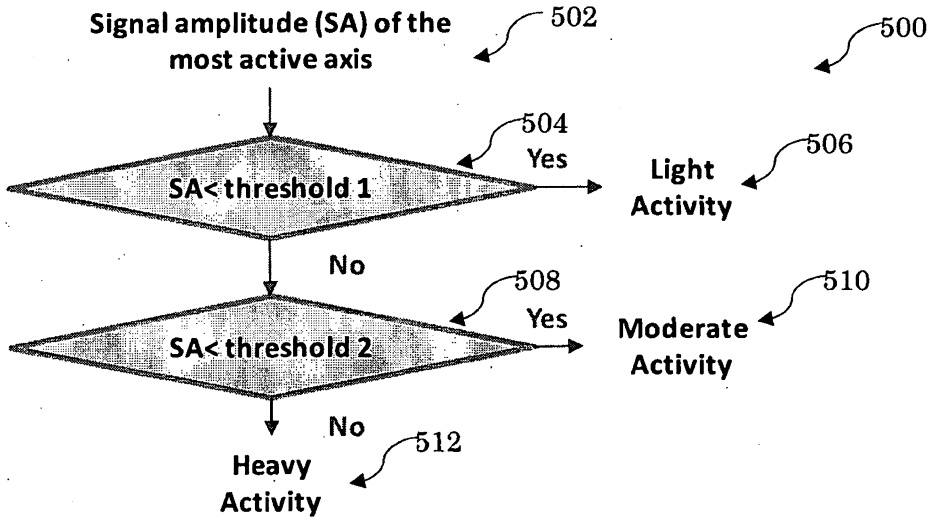


FIG. 6

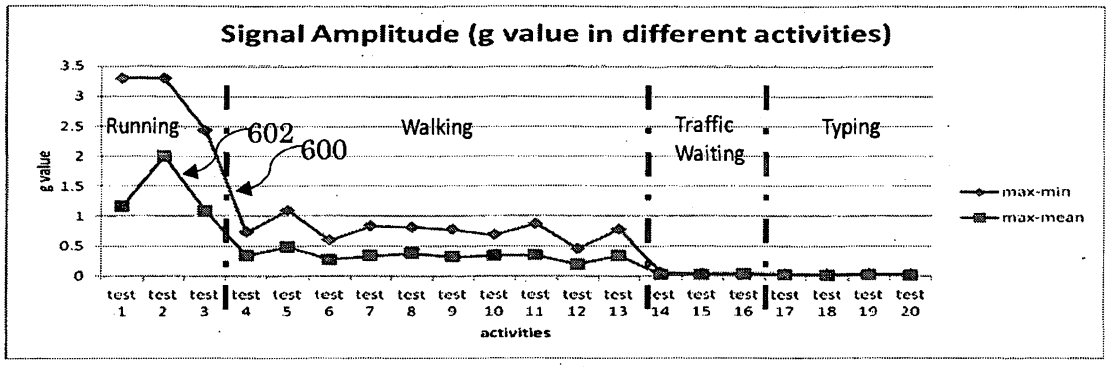

Signal Amplitude (g value in different activities)
g value
3.5
3
2.5
2
1.5
1
0.5
0
Running
602
600
Walking
Traffic
Waiting
Typing
max-min
max-mean
test 1
test 2
test 3
test 4
test 5
test 6
test 7
test 8
test 9
test 10
test 11
test 12
test 13
test 14
test 15
test 16
test 17
test 18
test 19
test 20
activities

FIG. 7

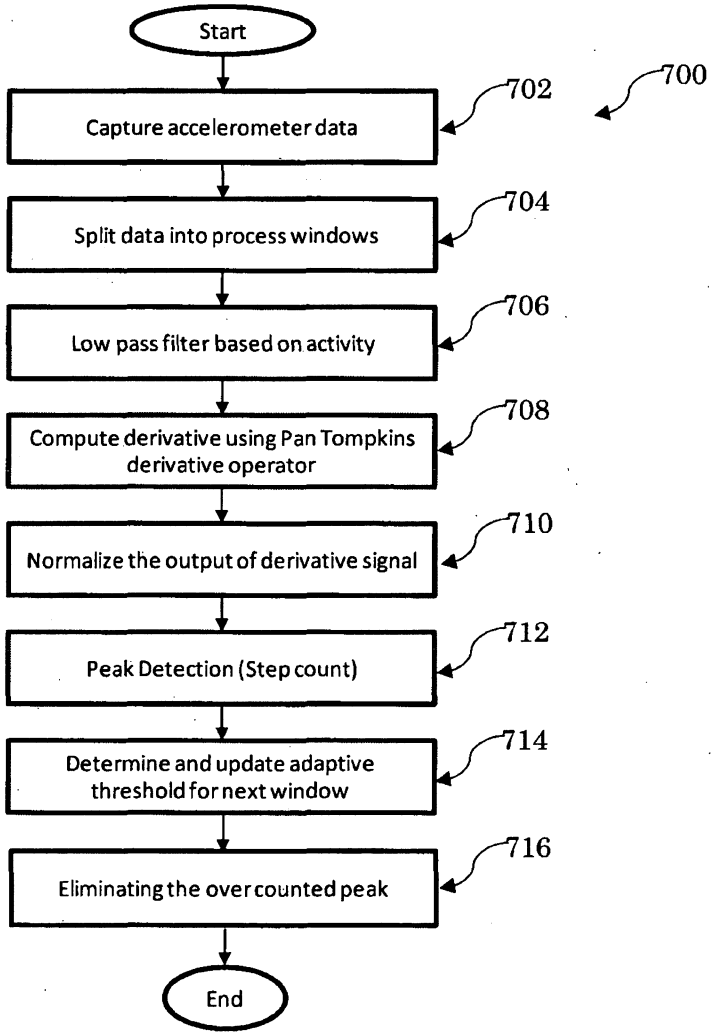

Start
Capture accelerometer data
Split data into process windows
Low pass filter based on activity
Compute derivative using Pan Tompkins derivative operator
Normalize the output of derivative signal
Peak Detection (Step count)
Determine and update adaptive threshold for next window
Eliminating the over counted peak
End
700
702
704
706
708
710
712
714
716

FIG. 8

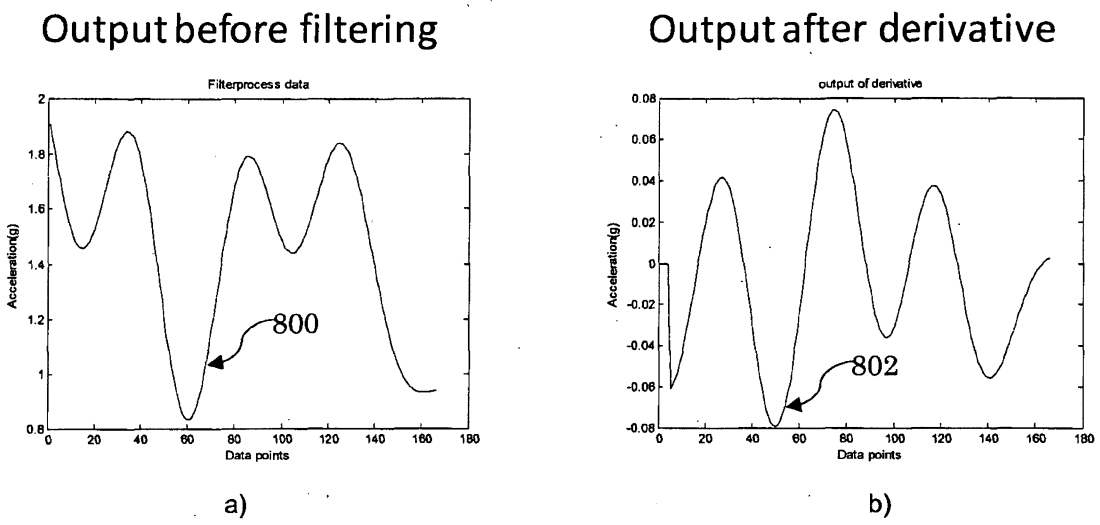


FIG. 9

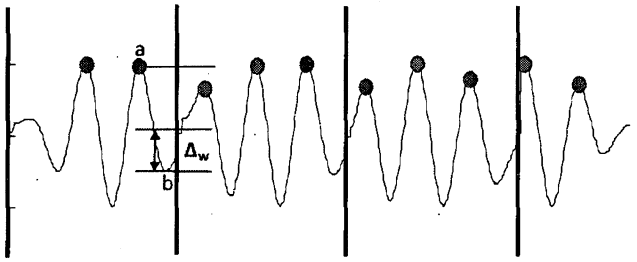


FIG. 10

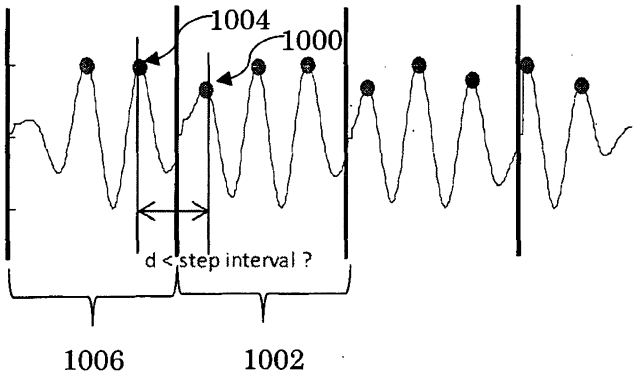


FIG. 11

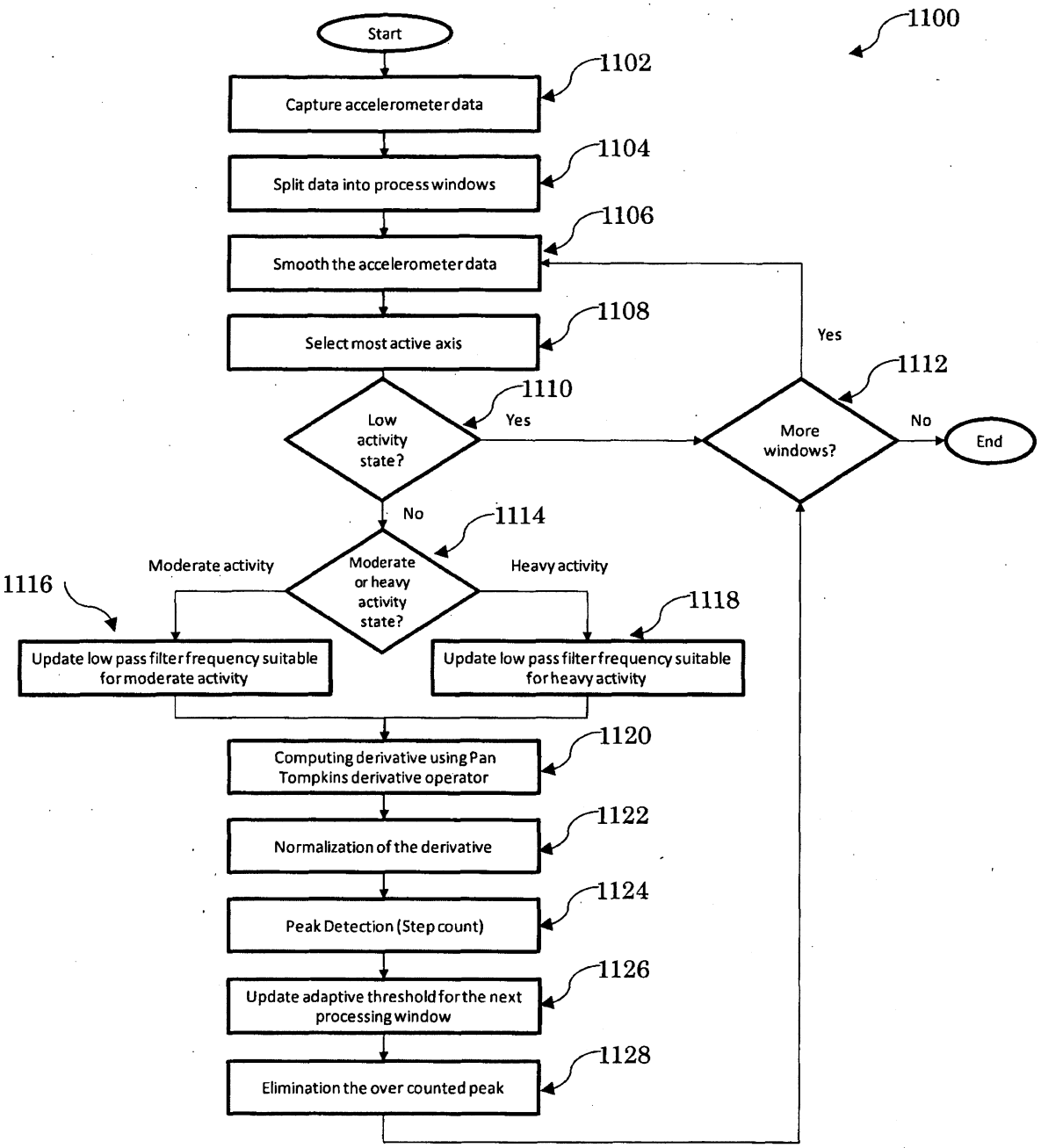

1100
Start
1102
Capture accelerometer data
1104
Split data into process windows
1106
Smooth the accelerometer data
1108
Select most active axis
1110
Low activity state?
Yes
No
1112
More windows?
Yes
No
End
1114
Moderate or heavy activity state?
Moderate activity
Heavy activity
1116
Update low pass filter frequency suitable for moderate activity
1118
Update low pass filter frequency suitable for heavy activity
1120
Computing derivative using Pan Tompkins derivative operator
1122
Normalization of the derivative
1124
Peak Detection (Step count)
1126
Update adaptive threshold for the next processing window
1128
Elimination the over counted peak

FIG. 12

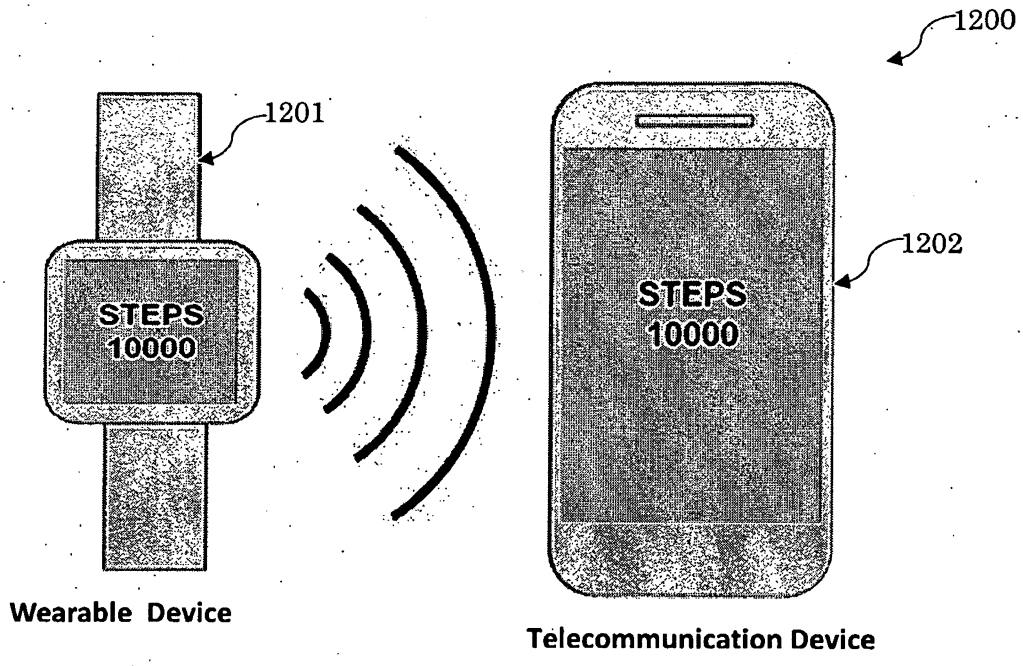

1200
1201
STEPS
10000
1202
STEPS
10000
Wearable Device
Telecommunication Device

FIG. 13

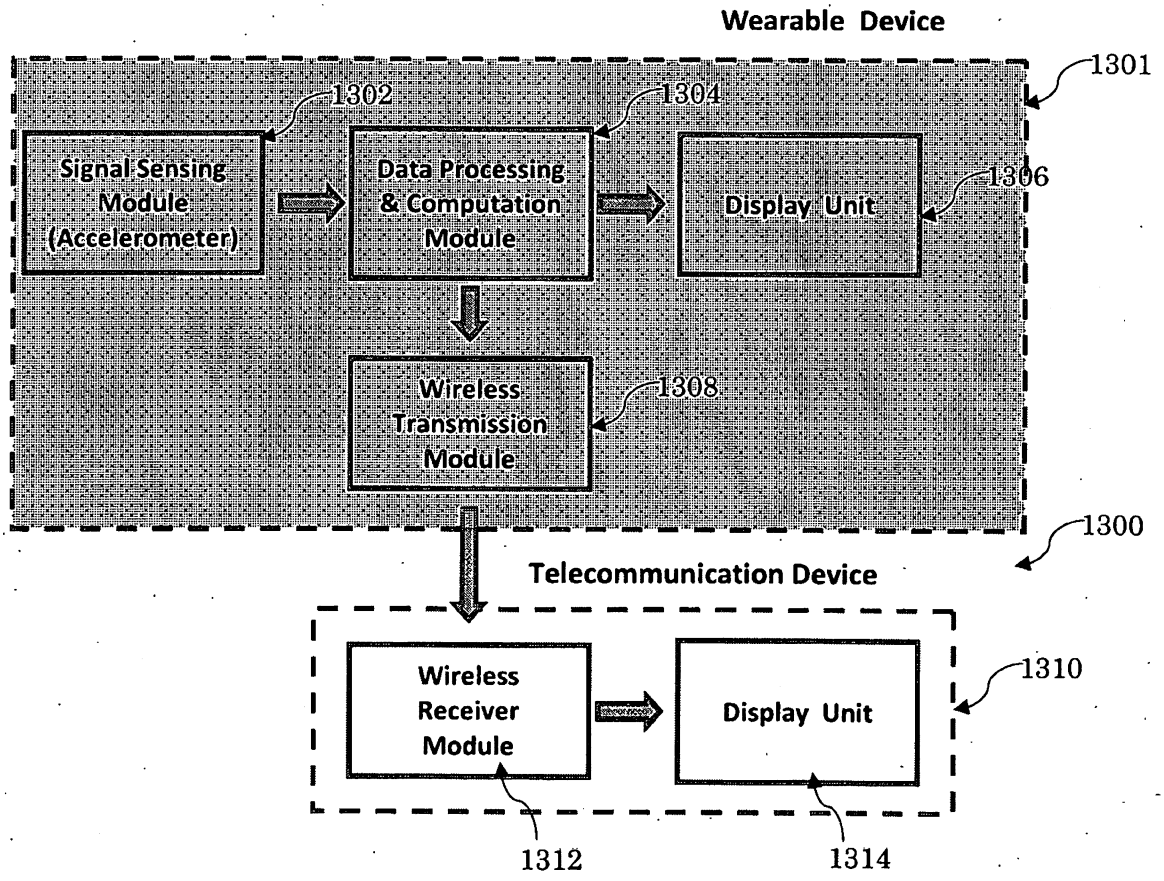

Wearable Device
1301
1302
1304
Signal Sensing Module (Accelerometer)
Data Processing & Computation Module
Display Unit
1306
Wireless Transmission Module
1308
1300
Telecommunication Device
Wireless Receiver Module
Display Unit
1310
1312
1314

FIG. 14

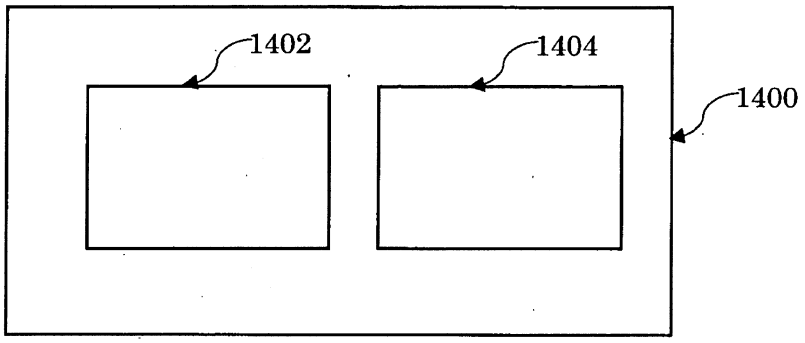


FIG. 15

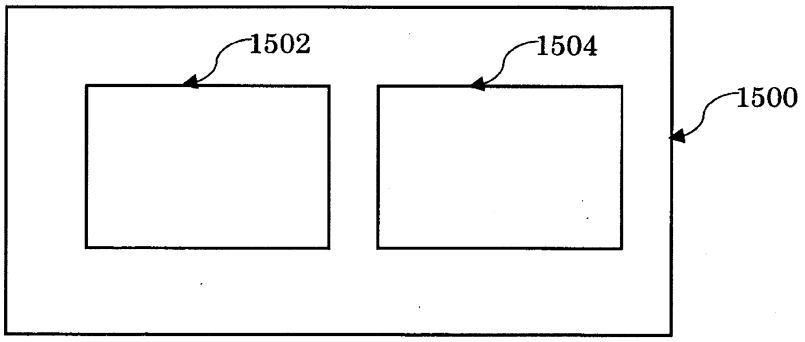


FIG. 16

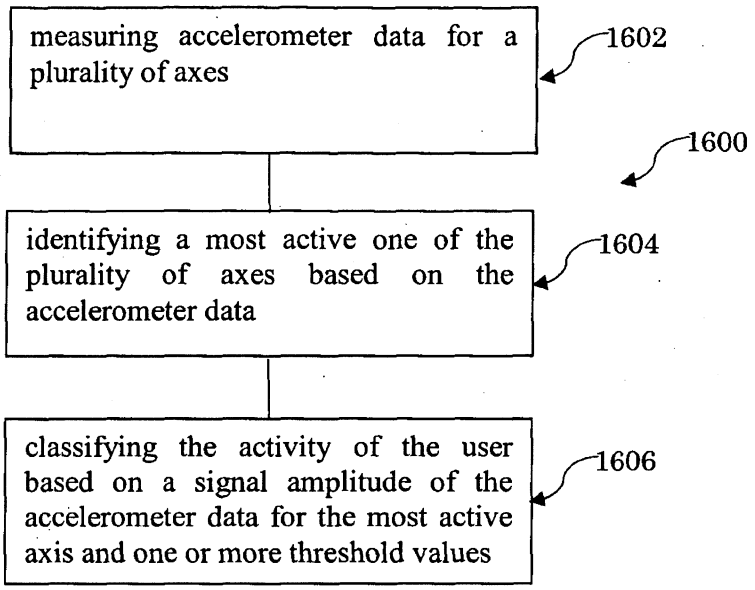
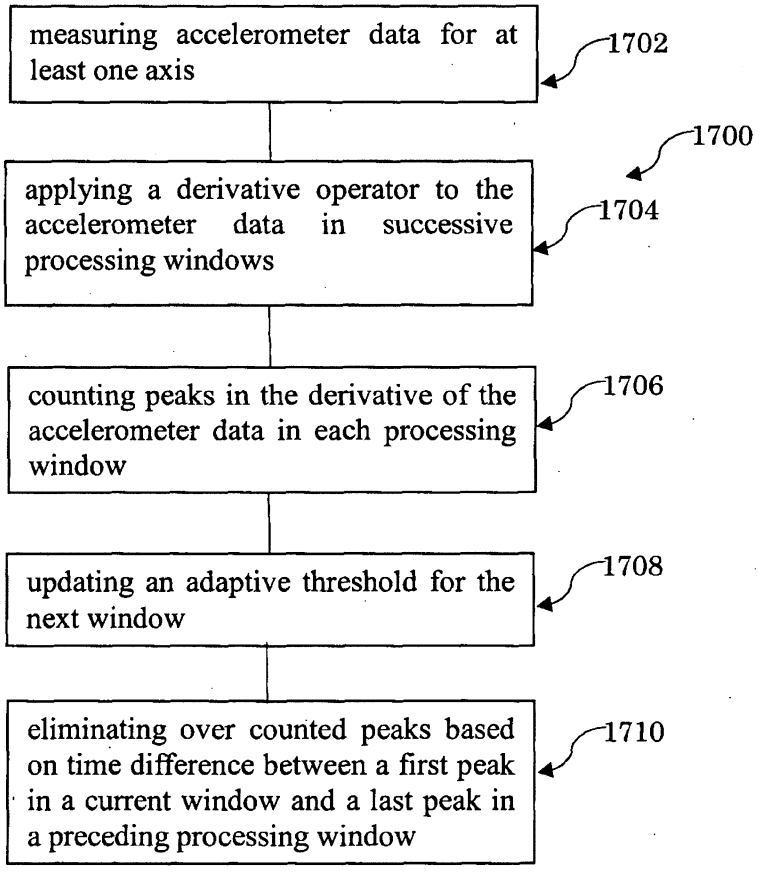

measuring accelerometer data for a plurality of axes
1602
1600
identifying a most active one of the plurality of axes based on the accelerometer data
1604
classifying the activity of the user based on a signal amplitude of the accelerometer data for the most active axis and one or more threshold values
1606

FIG. 17


measuring accelerometer data for at least one axis
1702
1700
applying a derivative operator to the accelerometer data in successive processing windows
1704
counting peaks in the derivative of the accelerometer data in each processing window
1706
updating an adaptive threshold for the next window
1708
eliminating over counted peaks based on time difference between a first peak in a current window and a last peak in a preceding processing window
1710