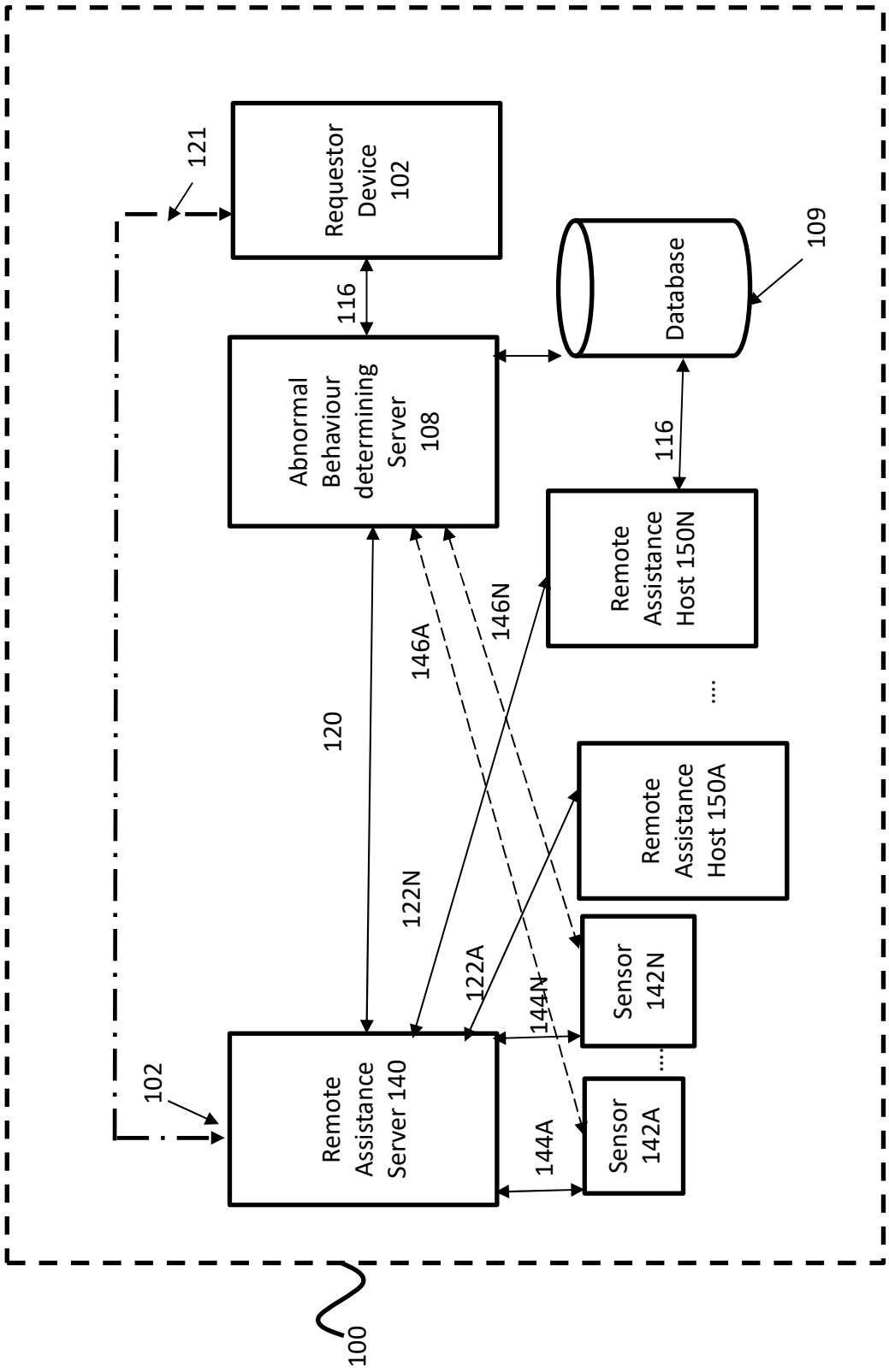
Requestor Device 102
121
116
Database
109
Abnormal Behaviour determining Server 108
116
Remote Assistance Host 150N
146N
146A
120
122N
Remote Assistance Host 150A
122A
Sensor 142N
144N
102
Remote Assistance Server 140
144A
Sensor 142A
100

FIG. 1

Cycle A

202

Time-series A

frame #	1	2	3	4	5	6
x	10	10	10	6	7	6
y	10	11	12	10	9	10

Cycle B

204

Time-series B

frame #	101	102	103	104	105	106
x	10	10	10	10	10	6
y	10	11	12	12	12	10

FIG. 2A

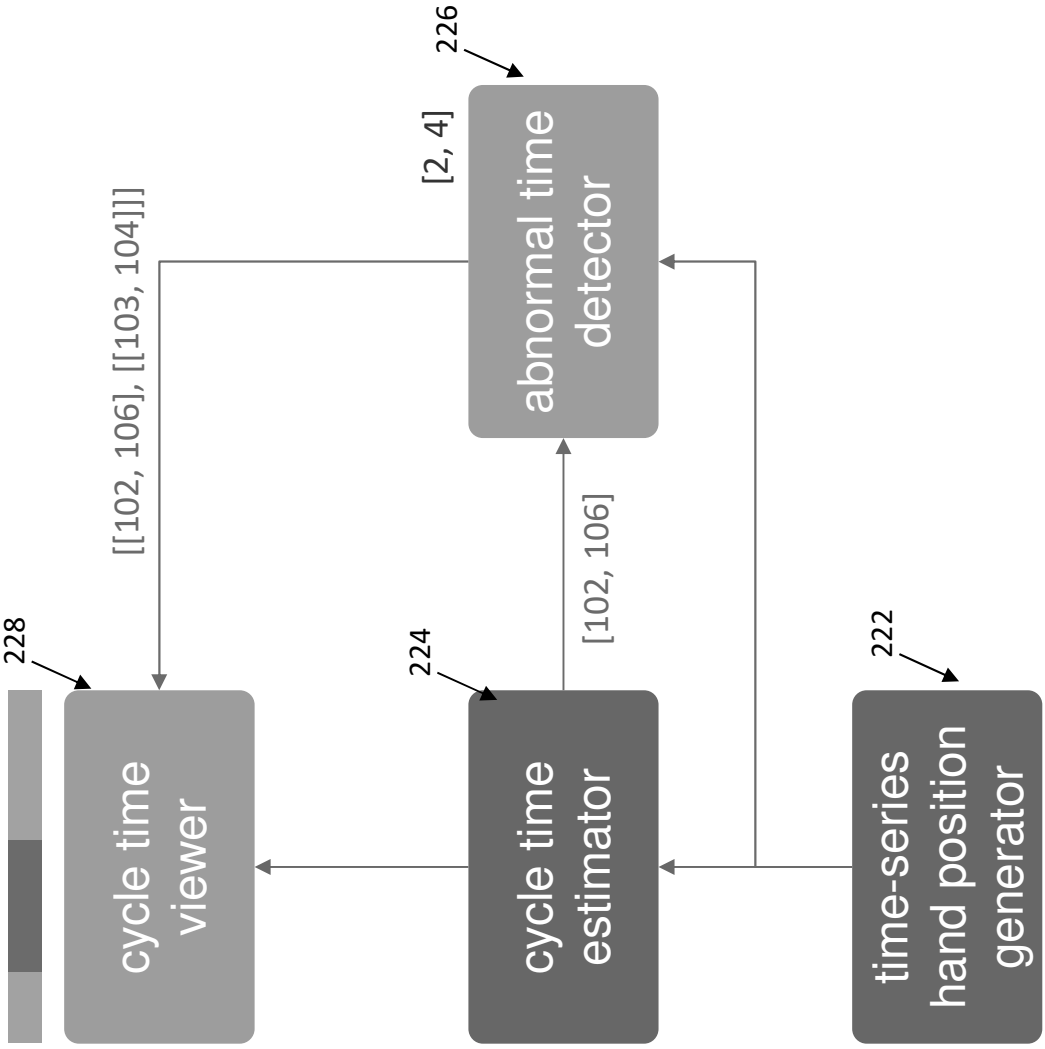
226
[2, 4]
abnormal time detector
[[102, 106], [[103, 104]]]
[102, 106]
228
224
222
cycle time viewer
cycle time estimator
time-series hand position generator

FIG. 2B

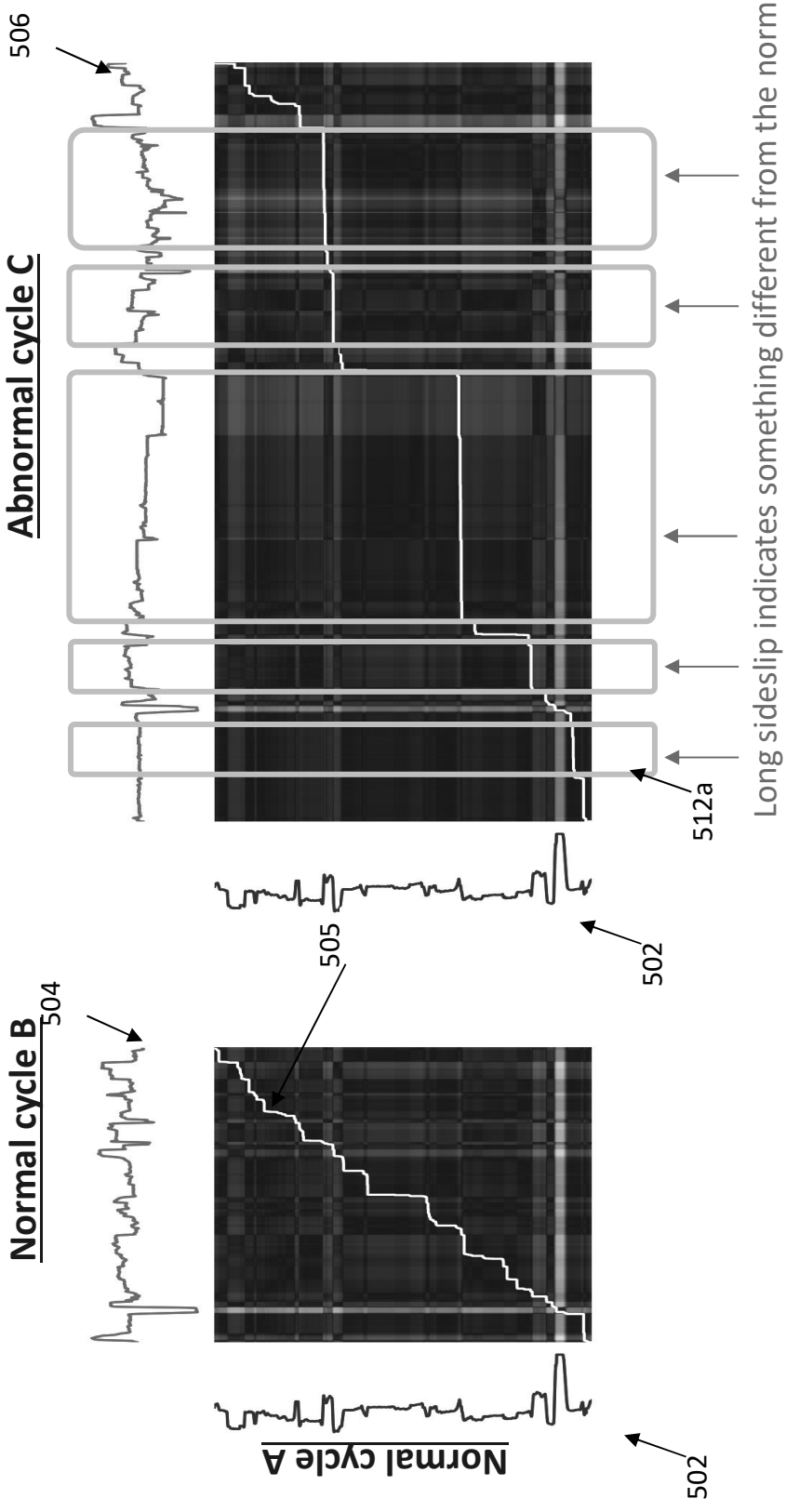
Normal cycle A
502
505
Normal cycle B
504
Abnormal cycle C
506
502
512a
Long sideslip indicates something different from the normal behaviors
510a

FIG. 3

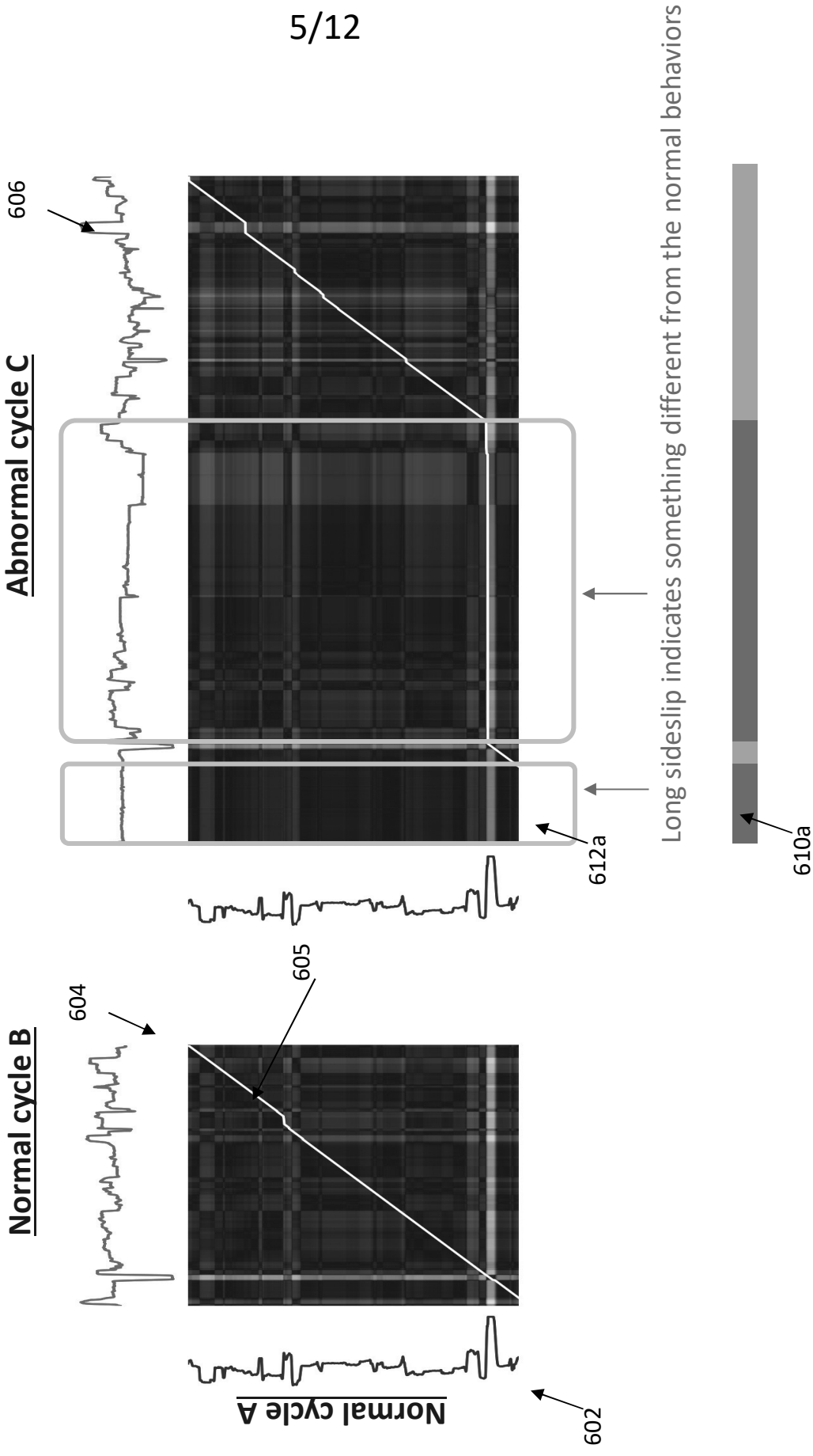
Normal cycle A
602
Normal cycle B
604
605
Abnormal cycle C
606
612a
Long sideslip indicates something different from the normal behaviors
610a

FIG. 4

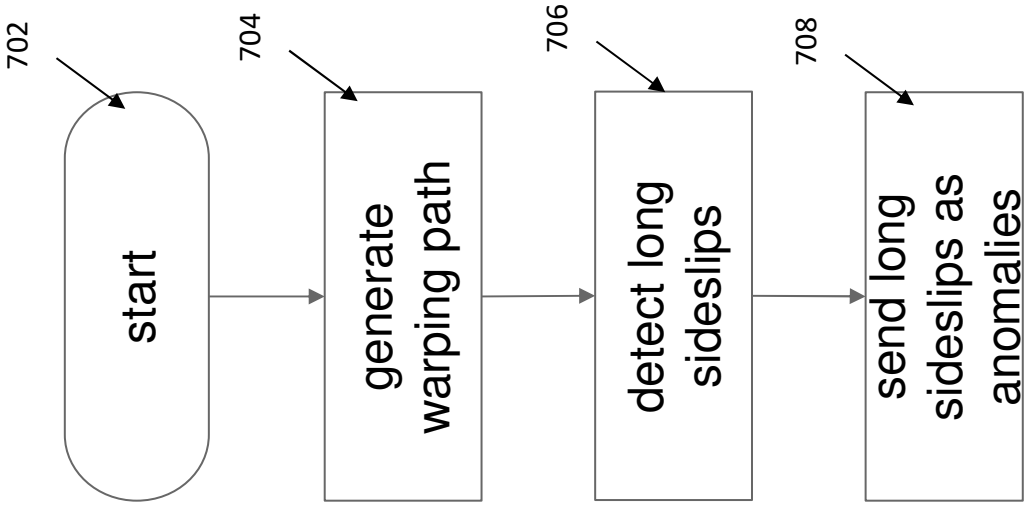
702
start
704
generate warping path
706
detect long sideslips
708
send long sideslips as anomalies

FIG. 5

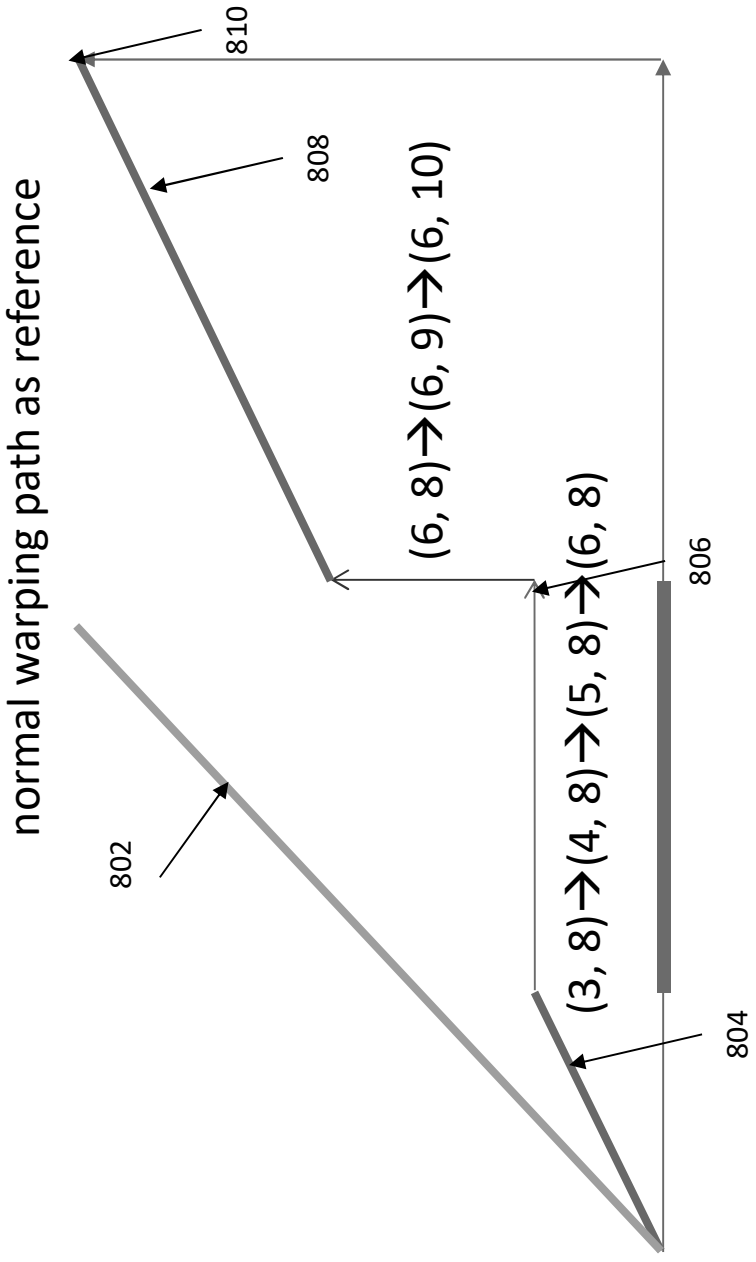
normal warping path as reference
802
804
806
808
810
(3, 8)→(4, 8)→(5, 8)→(6, 8)
(6, 8)→(6, 9)→(6, 10)

FIG. 6

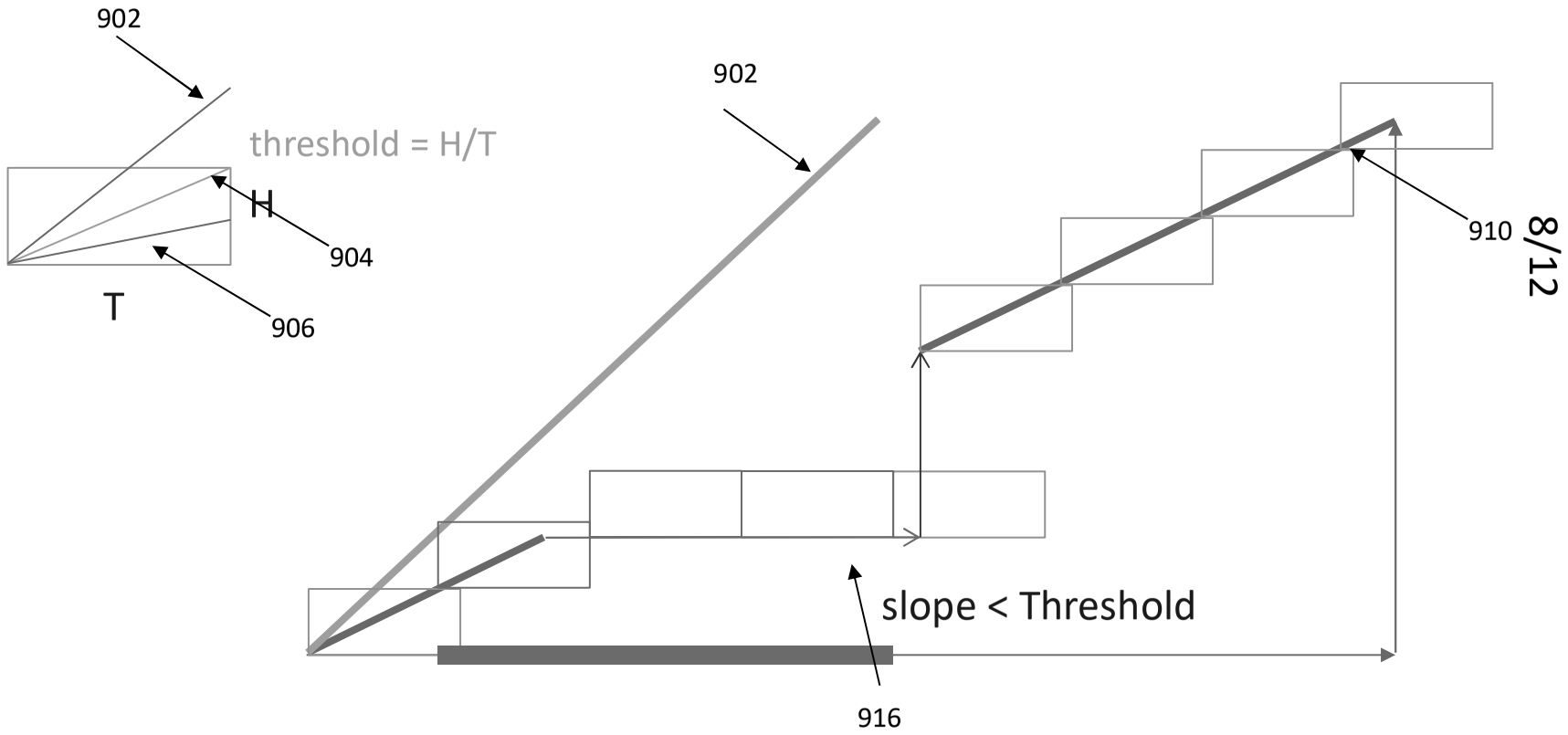

FIG. 7

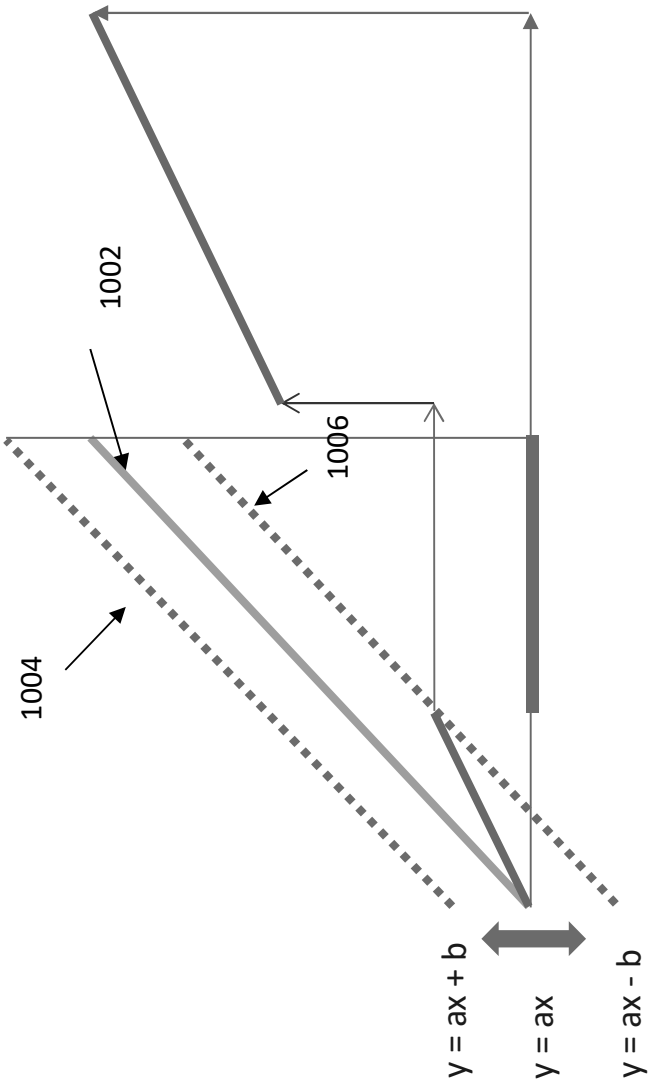

FIG. 8

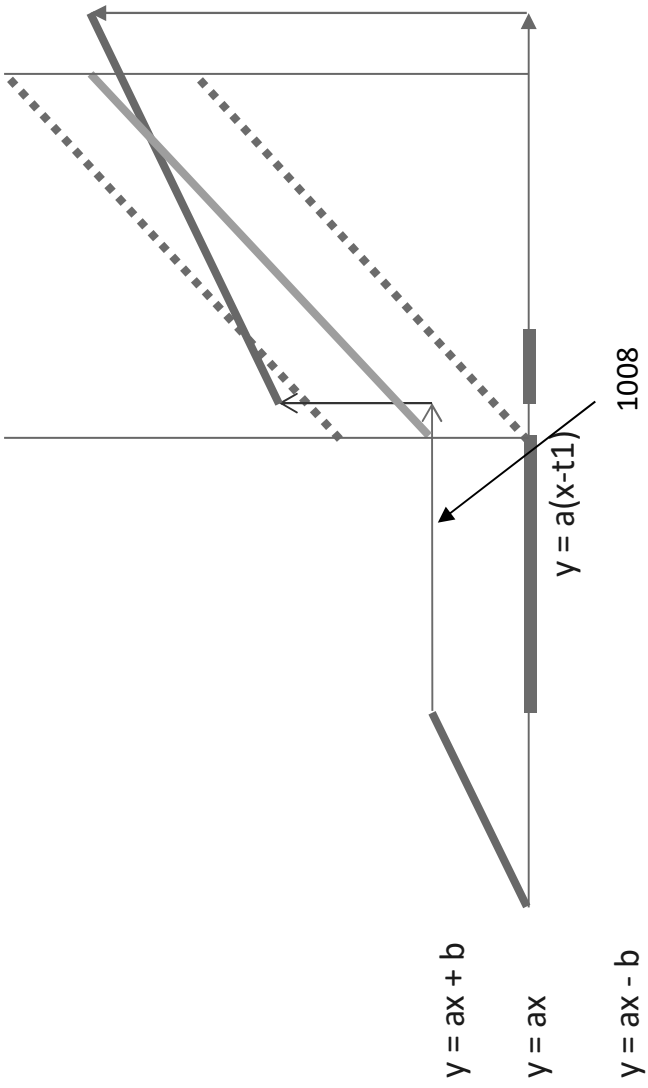

FIG. 9

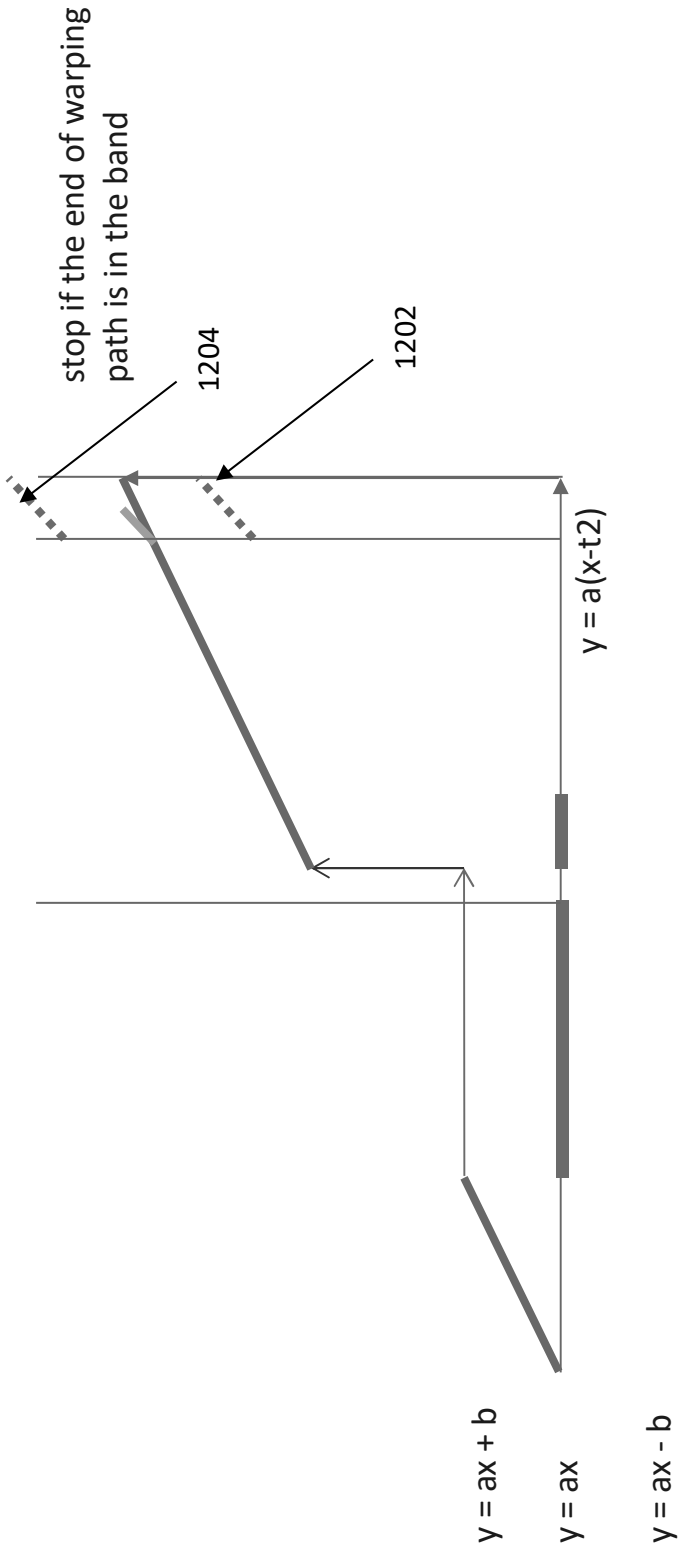
stop if the end of warping path is in the band
1204
1202
y = a(x-t2)
y = ax + b
y = ax
y = ax - b

FIG. 10

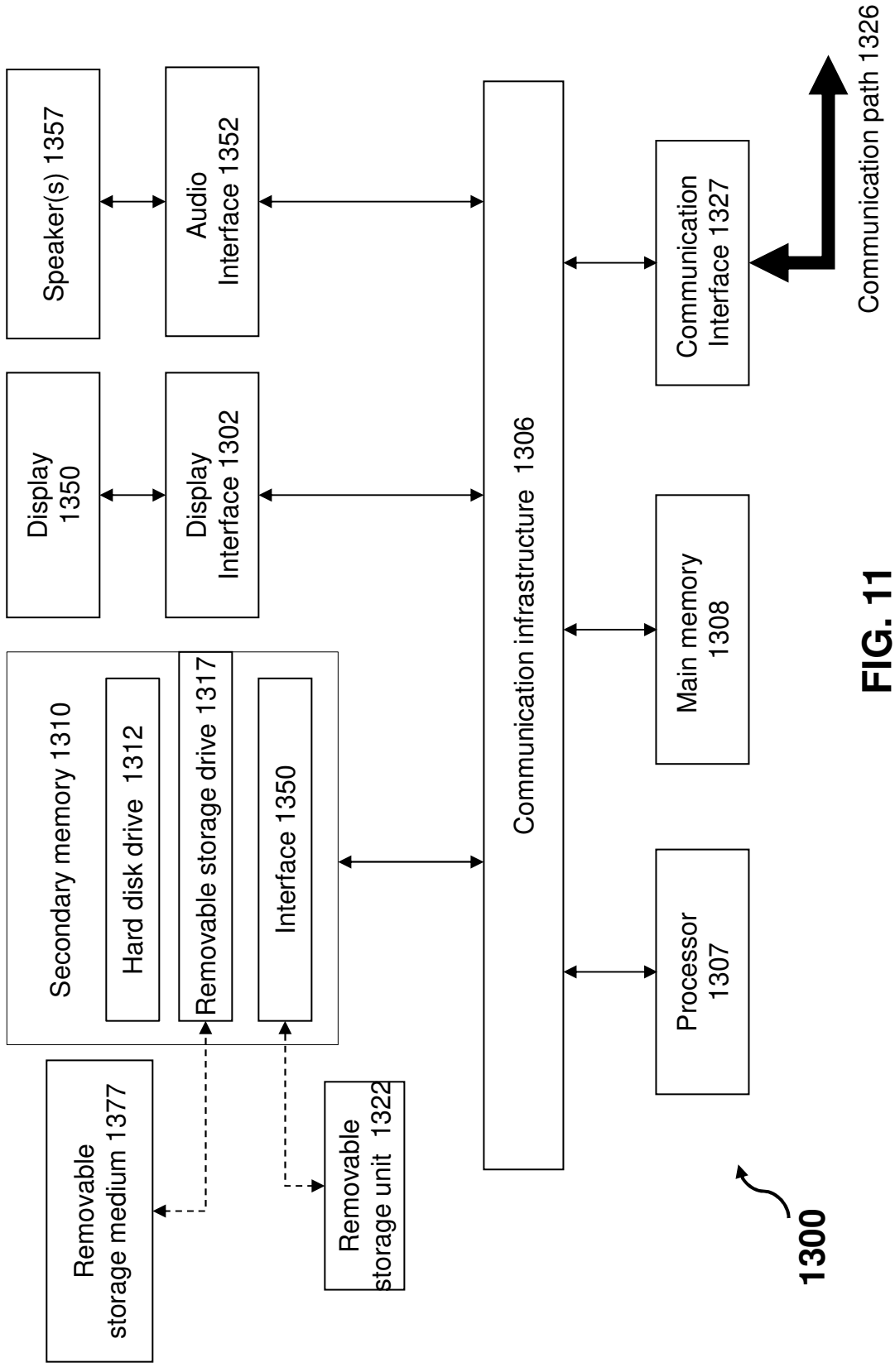
Speaker(s) 1357
Audio Interface 1352
Display 1350
Display Interface 1302
Secondary memory 1310
Hard disk drive 1312
Removable storage drive 1317
Interface 1350
Communication infrastructure 1306
Communication Interface 1327
Communication path 1326
Main memory 1308
Processor 1307
Removable storage medium 1377
Removable storage unit 1322
1300

FIG. 11