FIG. 1

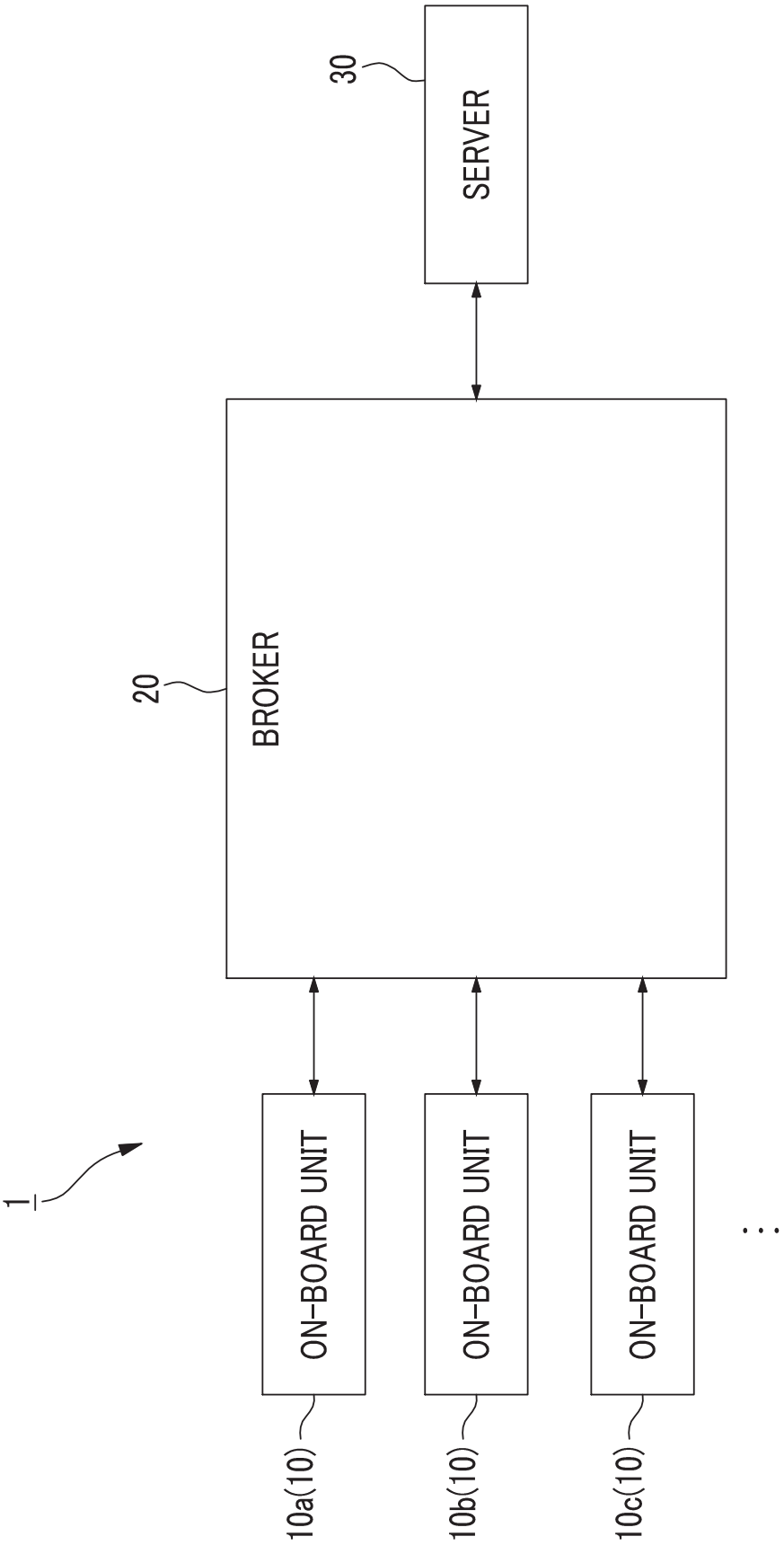

1
20
BROKER
30
SERVER
ON-BOARD UNIT
ON-BOARD UNIT
ON-BOARD UNIT
...
10a(10)
10b(10)
10c(10)

FIG. 2

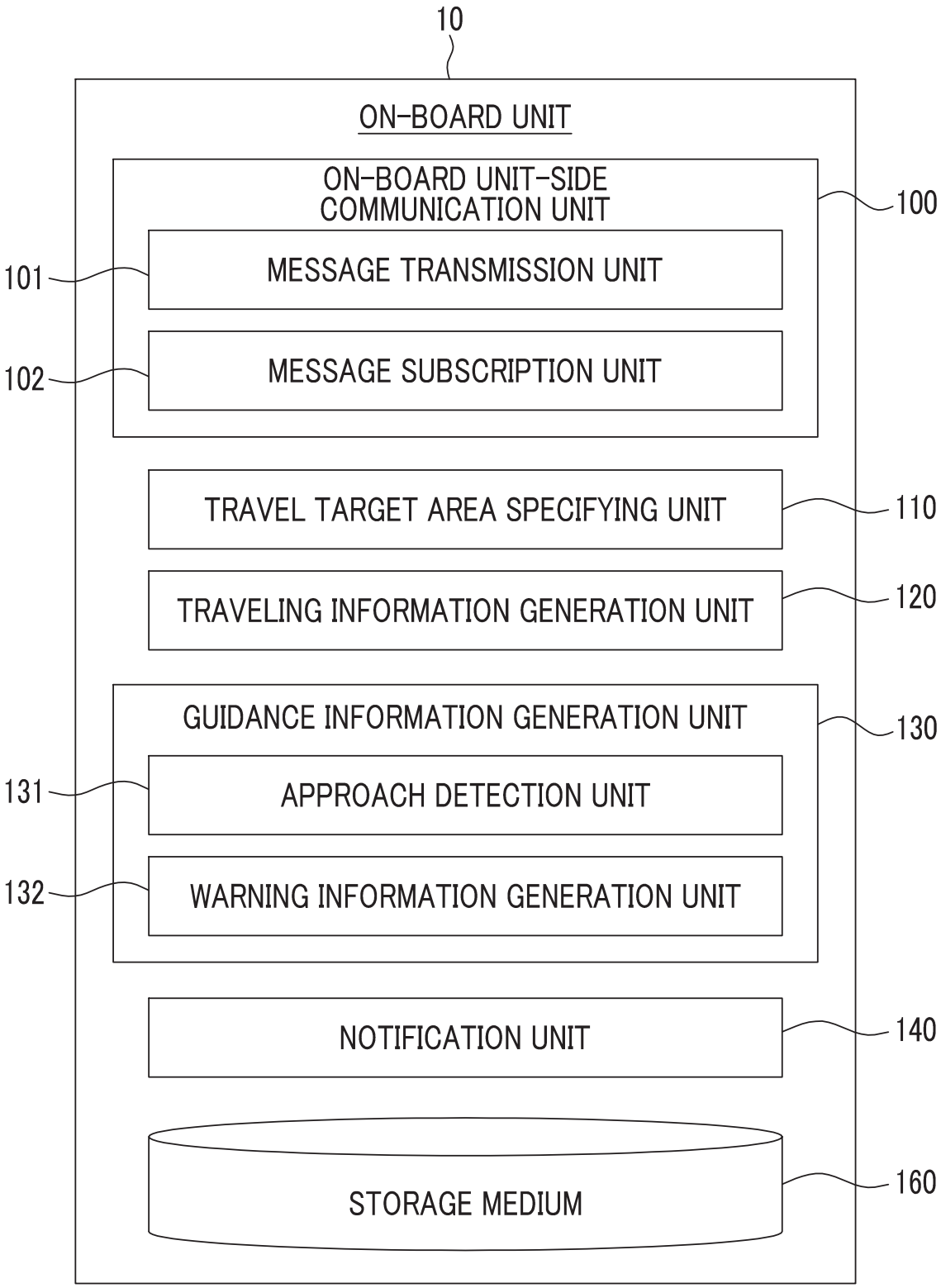

10
ON-BOARD UNIT
ON-BOARD UNIT-SIDE COMMUNICATION UNIT
100
101
MESSAGE TRANSMISSION UNIT
102
MESSAGE SUBSCRIPTION UNIT
TRAVEL TARGET AREA SPECIFYING UNIT
110
TRAVELING INFORMATION GENERATION UNIT
120
GUIDANCE INFORMATION GENERATION UNIT
130
131
APPROACH DETECTION UNIT
132
WARNING INFORMATION GENERATION UNIT
NOTIFICATION UNIT
140
STORAGE MEDIUM
160

FIG. 3

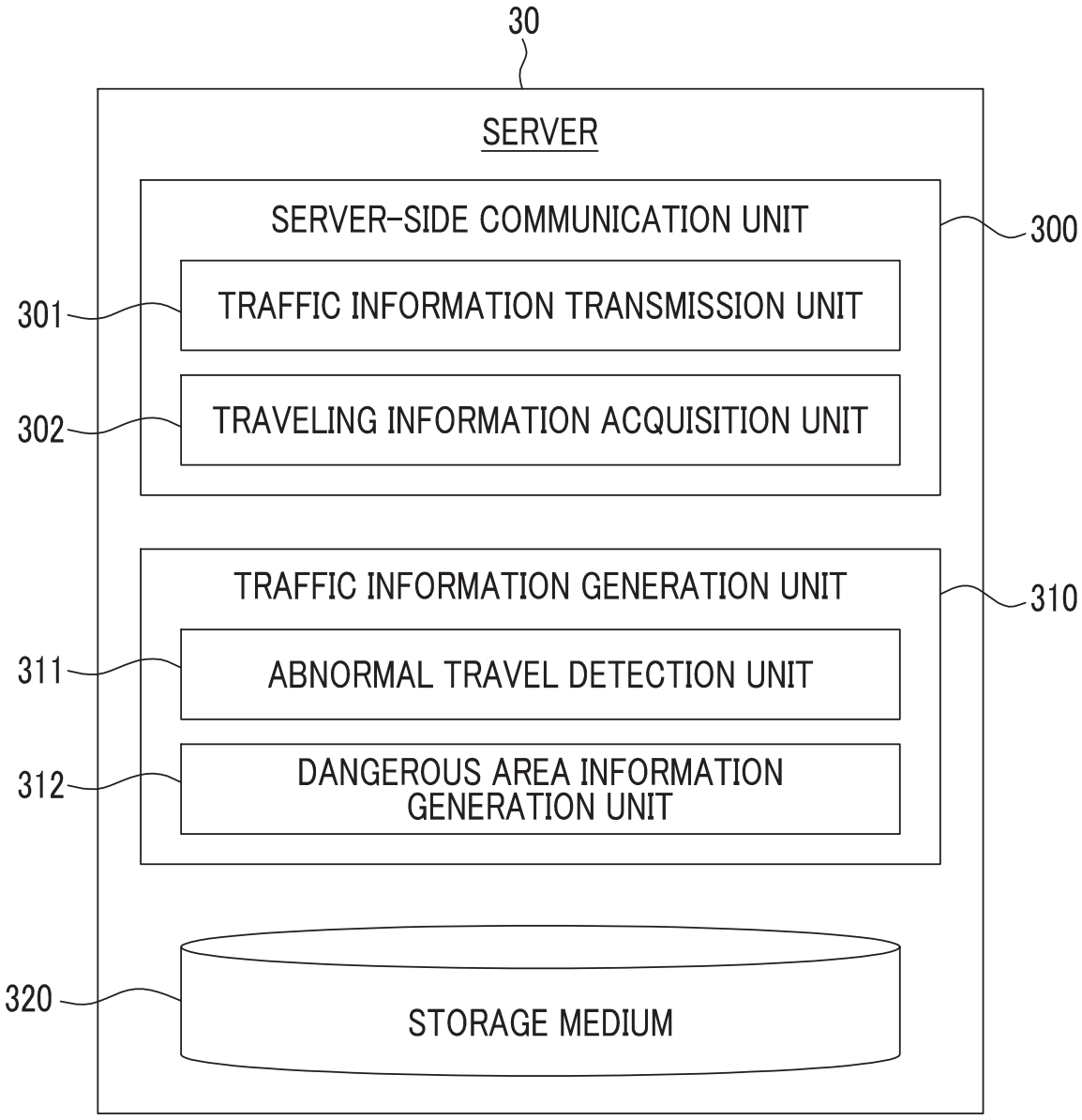

30
SERVER
SERVER-SIDE COMMUNICATION UNIT
300
301
TRAFFIC INFORMATION TRANSMISSION UNIT
302
TRAVELING INFORMATION ACQUISITION UNIT
TRAFFIC INFORMATION GENERATION UNIT
310
311
ABNORMAL TRAVEL DETECTION UNIT
312
DANGEROUS AREA INFORMATION GENERATION UNIT
320
STORAGE MEDIUM

FIG. 4

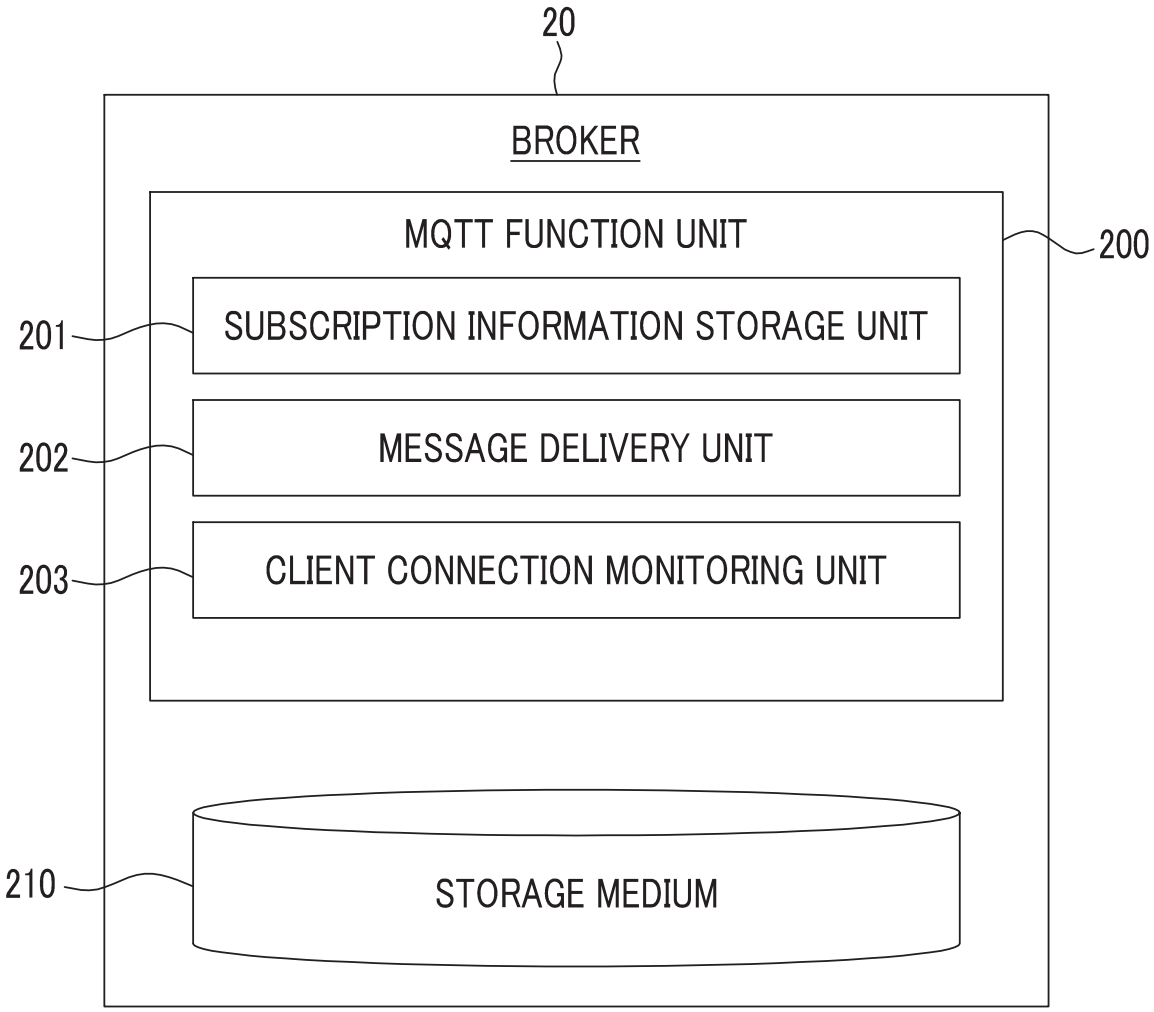

20
BROKER
MQTT FUNCTION UNIT
200
201
SUBSCRIPTION INFORMATION STORAGE UNIT
202
MESSAGE DELIVERY UNIT
203
CLIENT CONNECTION MONITORING UNIT
210
STORAGE MEDIUM

FIG. 5

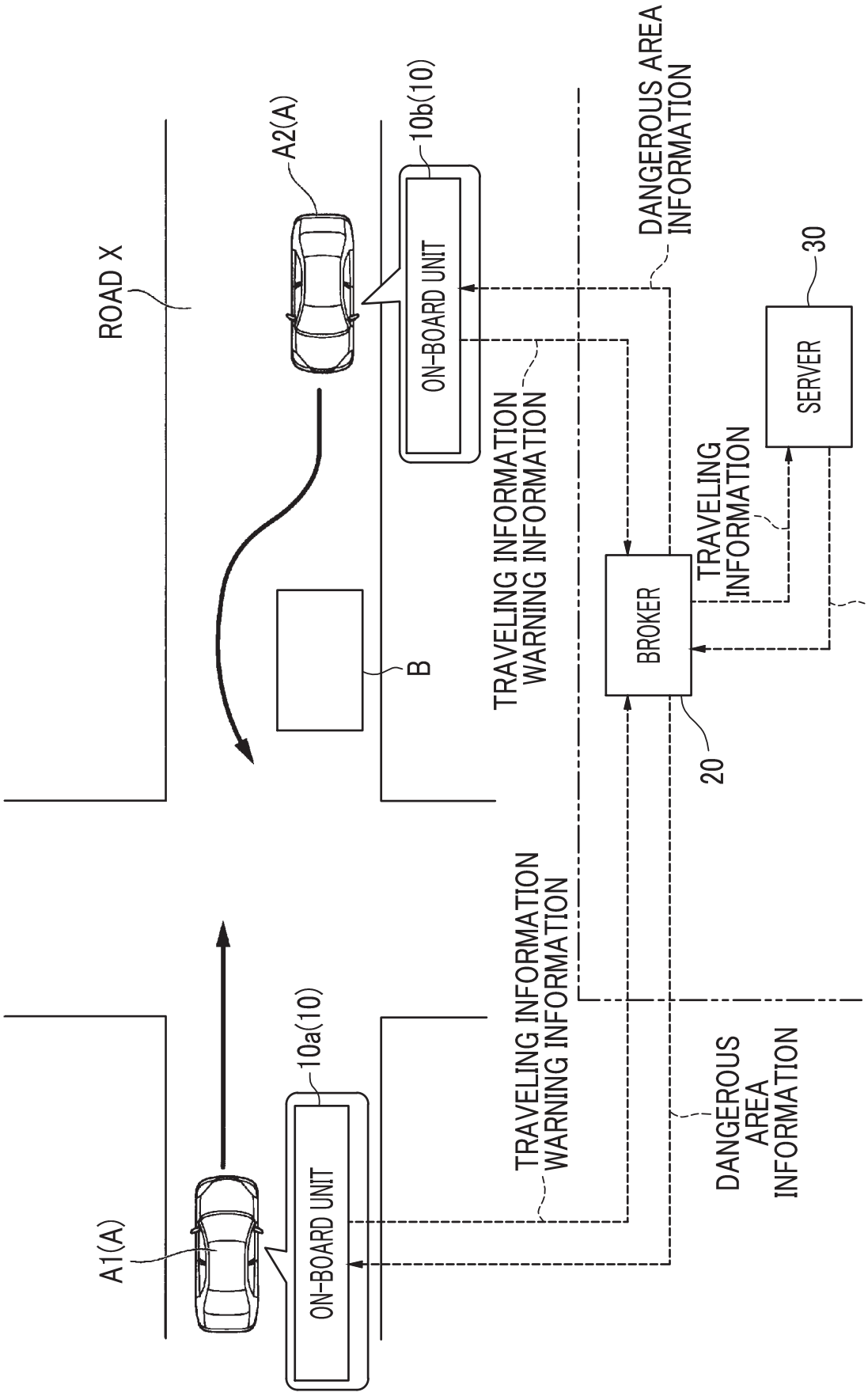

ROAD X
A1(A)
A2(A)
B
10a(10)
10b(10)
ON-BOARD UNIT
ON-BOARD UNIT
TRAVELING INFORMATION
WARNING INFORMATION
TRAVELING INFORMATION
WARNING INFORMATION
DANGEROUS AREA
INFORMATION
DANGEROUS
AREA
INFORMATION
BROKER
20
SERVER
30
TRAVELING
INFORMATION
DANGEROUS AREA
INFORMATION

FIG. 6

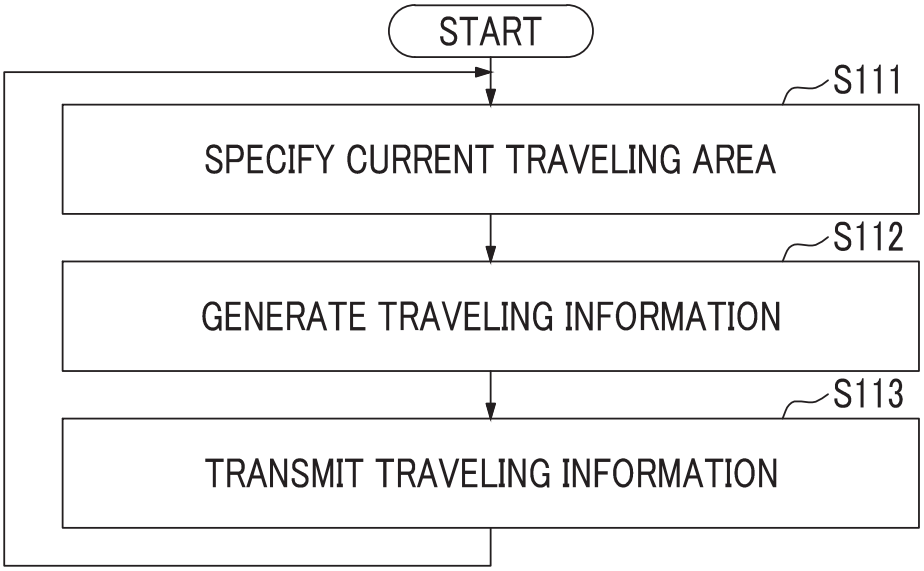

START
S111
SPECIFY CURRENT TRAVELING AREA
S112
GENERATE TRAVELING INFORMATION
S113
TRANSMIT TRAVELING INFORMATION

FIG. 7

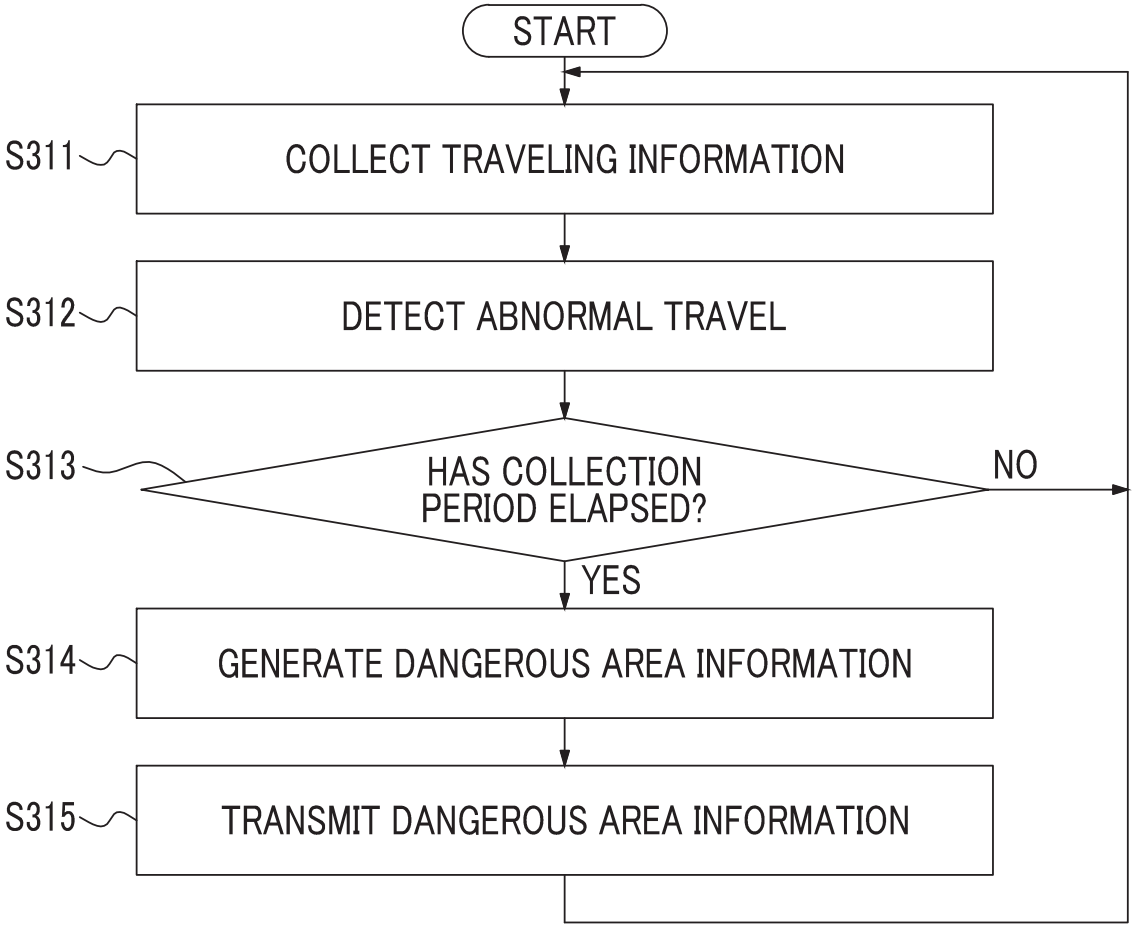

START
S311
COLLECT TRAVELING INFORMATION
S312
DETECT ABNORMAL TRAVEL
S313
HAS COLLECTION PERIOD ELAPSED?
NO
YES
S314
GENERATE DANGEROUS AREA INFORMATION
S315
TRANSMIT DANGEROUS AREA INFORMATION

FIG. 8

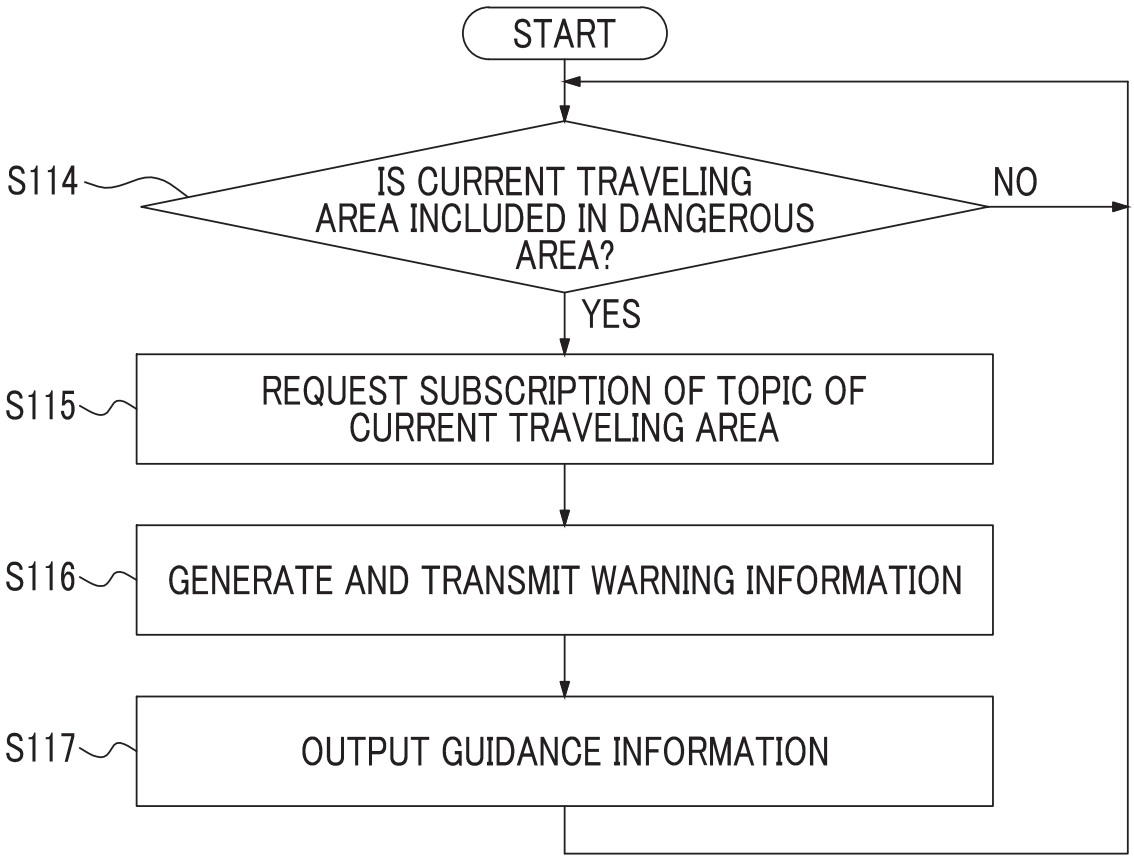

START
S114
IS CURRENT TRAVELING AREA INCLUDED IN DANGEROUS AREA?
NO
YES
S115
REQUEST SUBSCRIPTION OF TOPIC OF CURRENT TRAVELING AREA
S116
GENERATE AND TRANSMIT WARNING INFORMATION
S117
OUTPUT GUIDANCE INFORMATION

FIG. 9

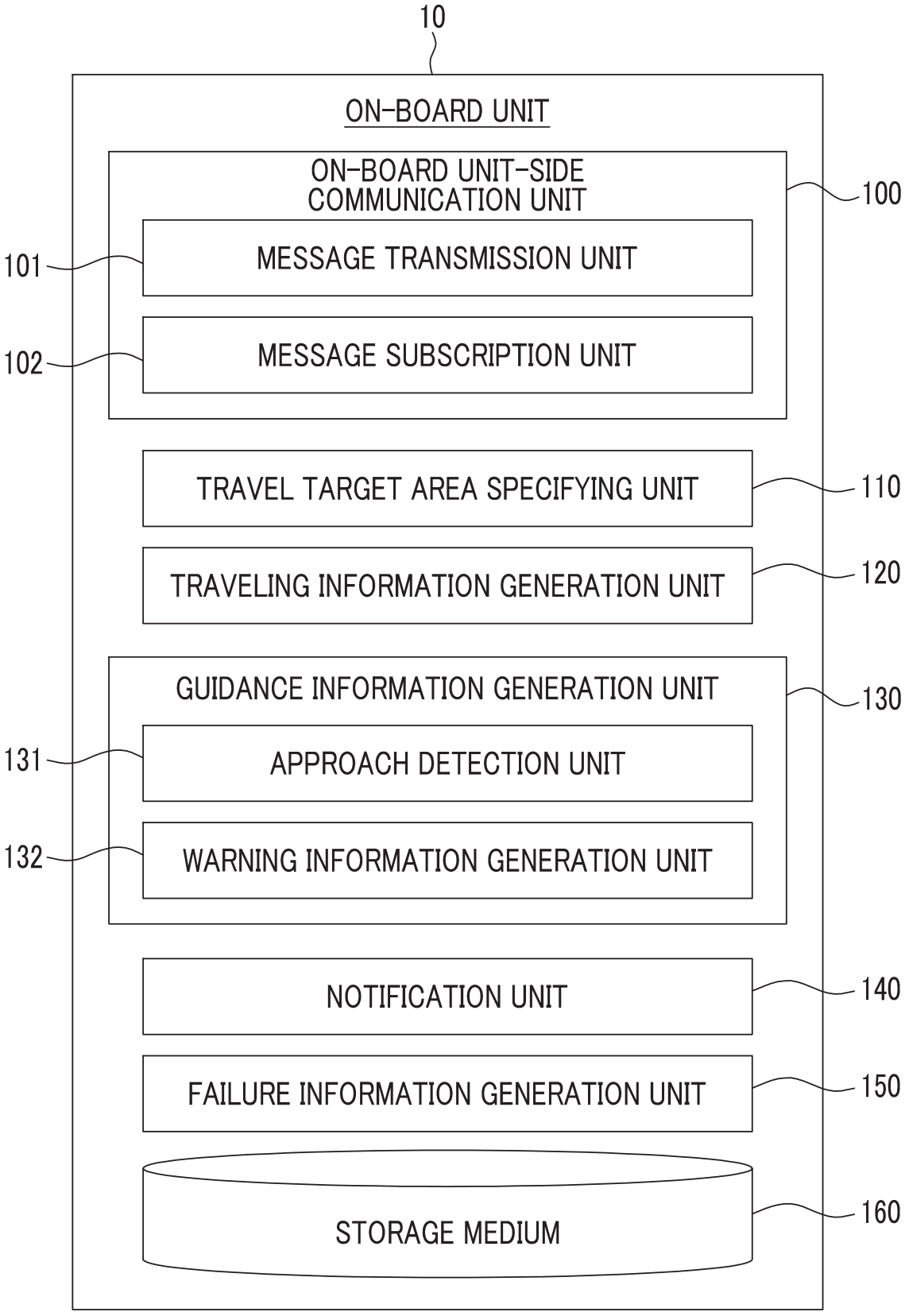

10
ON-BOARD UNIT
ON-BOARD UNIT-SIDE COMMUNICATION UNIT
100
101
MESSAGE TRANSMISSION UNIT
102
MESSAGE SUBSCRIPTION UNIT
TRAVEL TARGET AREA SPECIFYING UNIT
110
TRAVELING INFORMATION GENERATION UNIT
120
GUIDANCE INFORMATION GENERATION UNIT
130
131
APPROACH DETECTION UNIT
132
WARNING INFORMATION GENERATION UNIT
NOTIFICATION UNIT
140
FAILURE INFORMATION GENERATION UNIT
150
STORAGE MEDIUM
160

FIG. 10

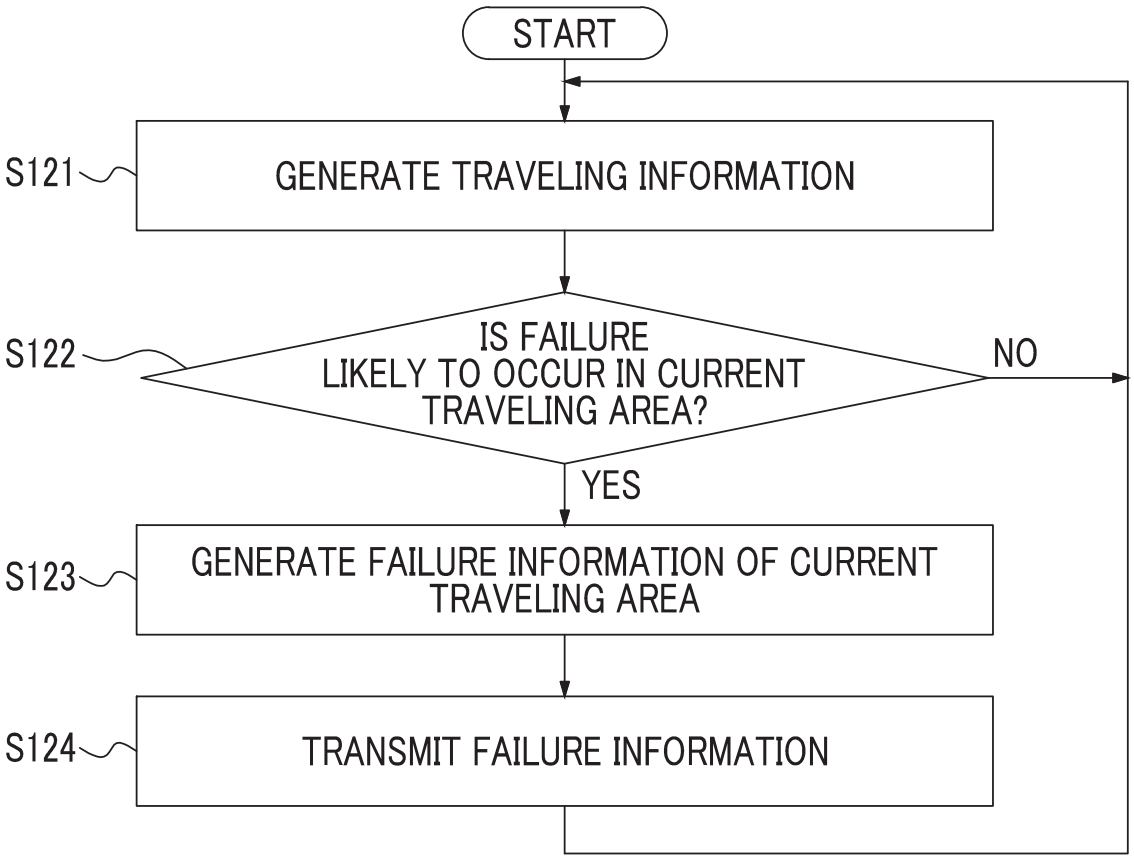

START
S121
GENERATE TRAVELING INFORMATION
S122
IS FAILURE LIKELY TO OCCUR IN CURRENT TRAVELING AREA?
NO
YES
S123
GENERATE FAILURE INFORMATION OF CURRENT TRAVELING AREA
S124
TRANSMIT FAILURE INFORMATION

FIG. 11

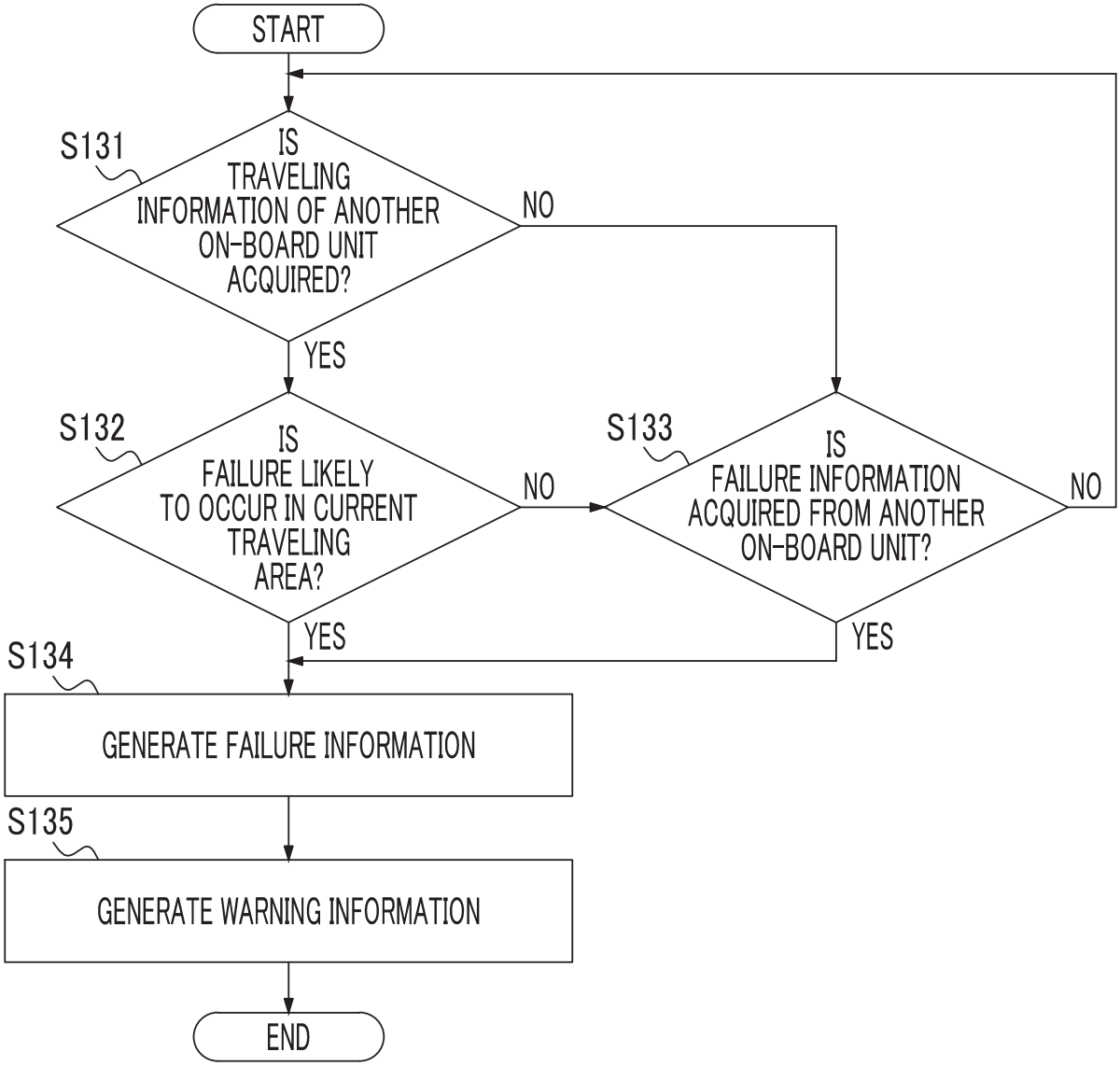

START
S131
IS TRAVELING INFORMATION OF ANOTHER ON-BOARD UNIT ACQUIRED?
NO
YES
S132
IS FAILURE LIKELY TO OCCUR IN CURRENT TRAVELING AREA?
NO
S133
IS FAILURE INFORMATION ACQUIRED FROM ANOTHER ON-BOARD UNIT?
NO
YES
YES
S134
GENERATE FAILURE INFORMATION
S135
GENERATE WARNING INFORMATION
END

FIG. 12

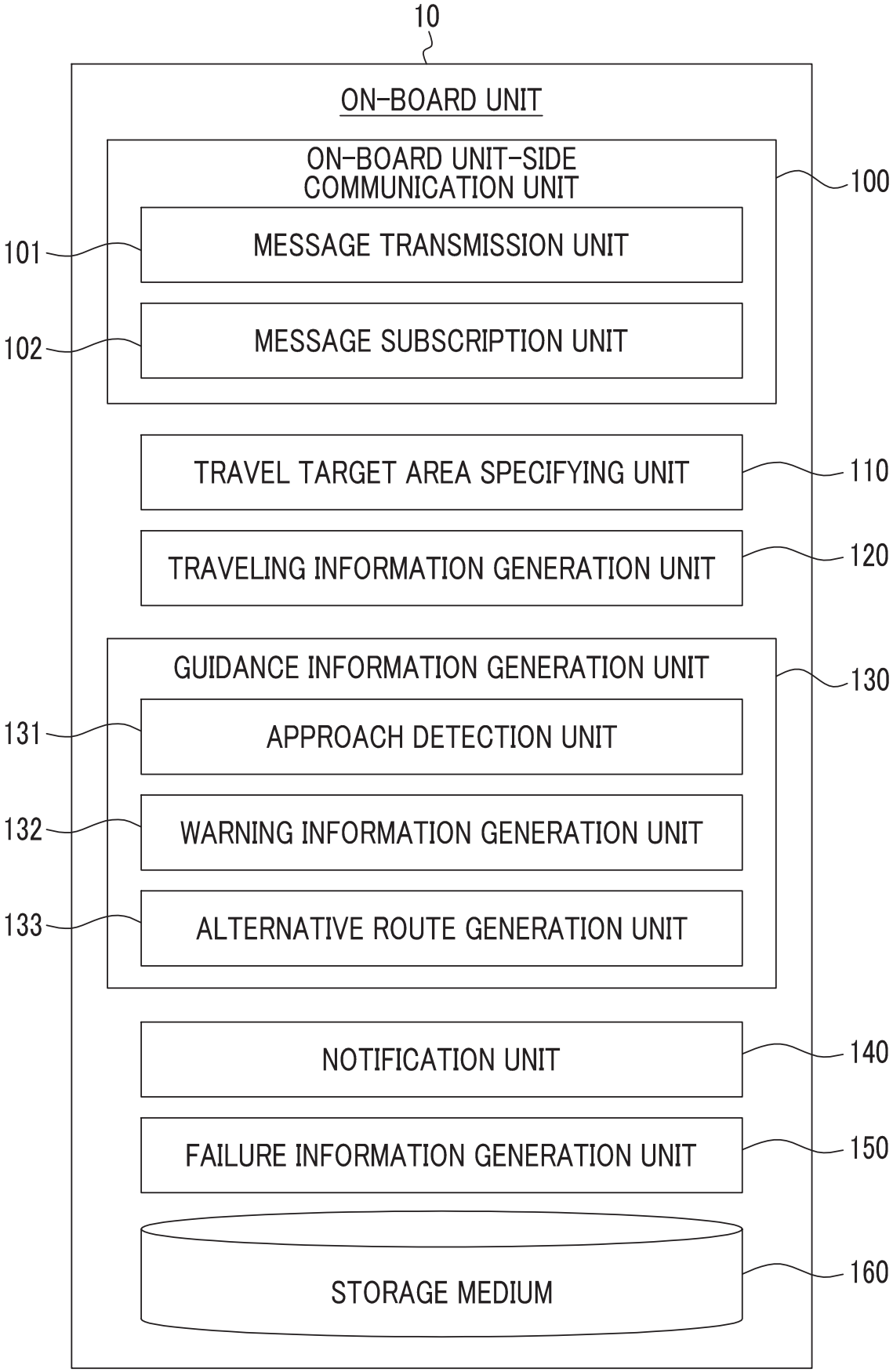

10
ON-BOARD UNIT
ON-BOARD UNIT-SIDE COMMUNICATION UNIT
100
101
MESSAGE TRANSMISSION UNIT
102
MESSAGE SUBSCRIPTION UNIT
TRAVEL TARGET AREA SPECIFYING UNIT
110
TRAVELING INFORMATION GENERATION UNIT
120
GUIDANCE INFORMATION GENERATION UNIT
130
131
APPROACH DETECTION UNIT
132
WARNING INFORMATION GENERATION UNIT
133
ALTERNATIVE ROUTE GENERATION UNIT
NOTIFICATION UNIT
140
FAILURE INFORMATION GENERATION UNIT
150
STORAGE MEDIUM
160

FIG. 13

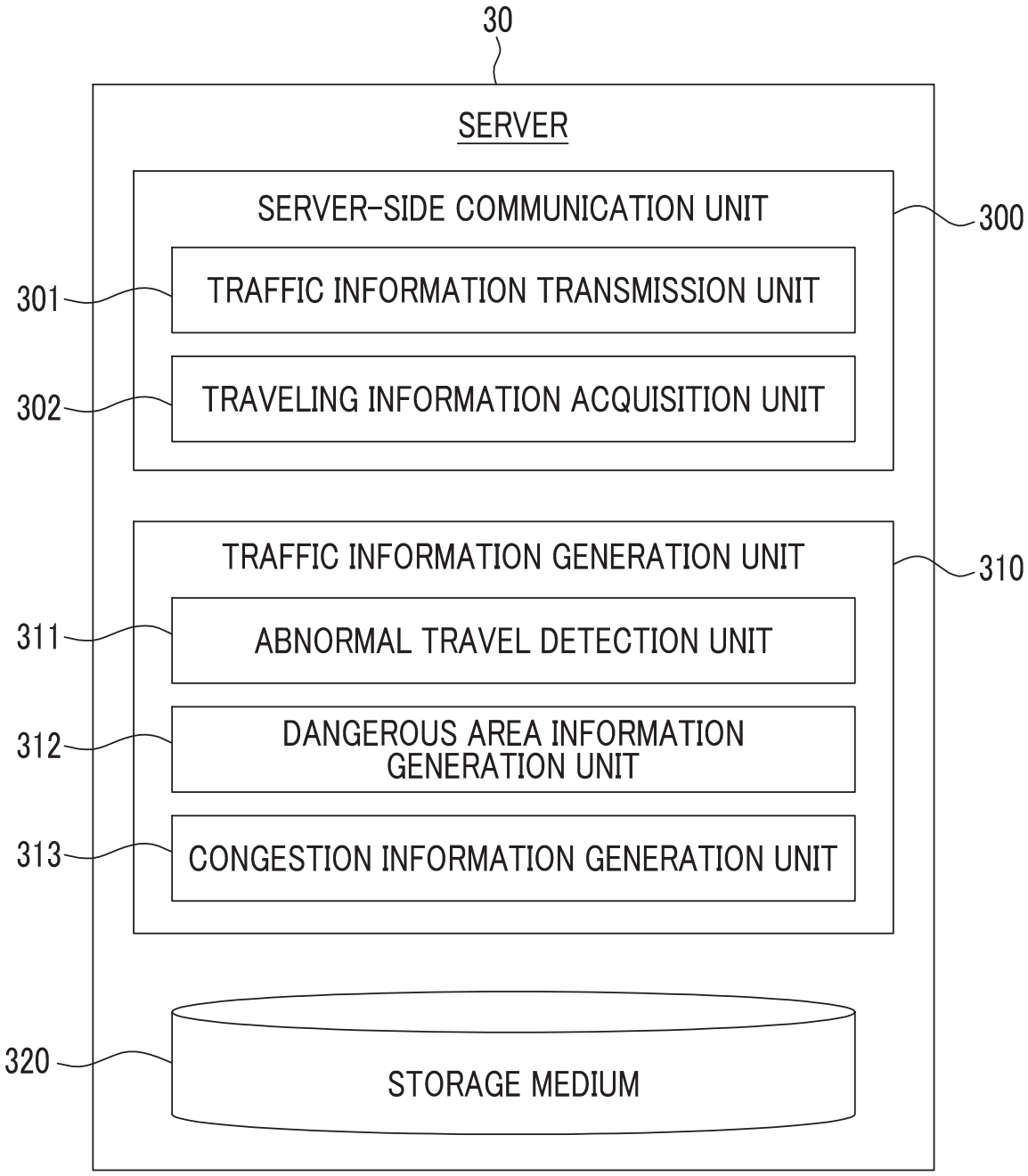

30
SERVER
SERVER-SIDE COMMUNICATION UNIT
300
301
TRAFFIC INFORMATION TRANSMISSION UNIT
302
TRAVELING INFORMATION ACQUISITION UNIT
TRAFFIC INFORMATION GENERATION UNIT
310
311
ABNORMAL TRAVEL DETECTION UNIT
312
DANGEROUS AREA INFORMATION GENERATION UNIT
313
CONGESTION INFORMATION GENERATION UNIT
320
STORAGE MEDIUM

FIG. 14

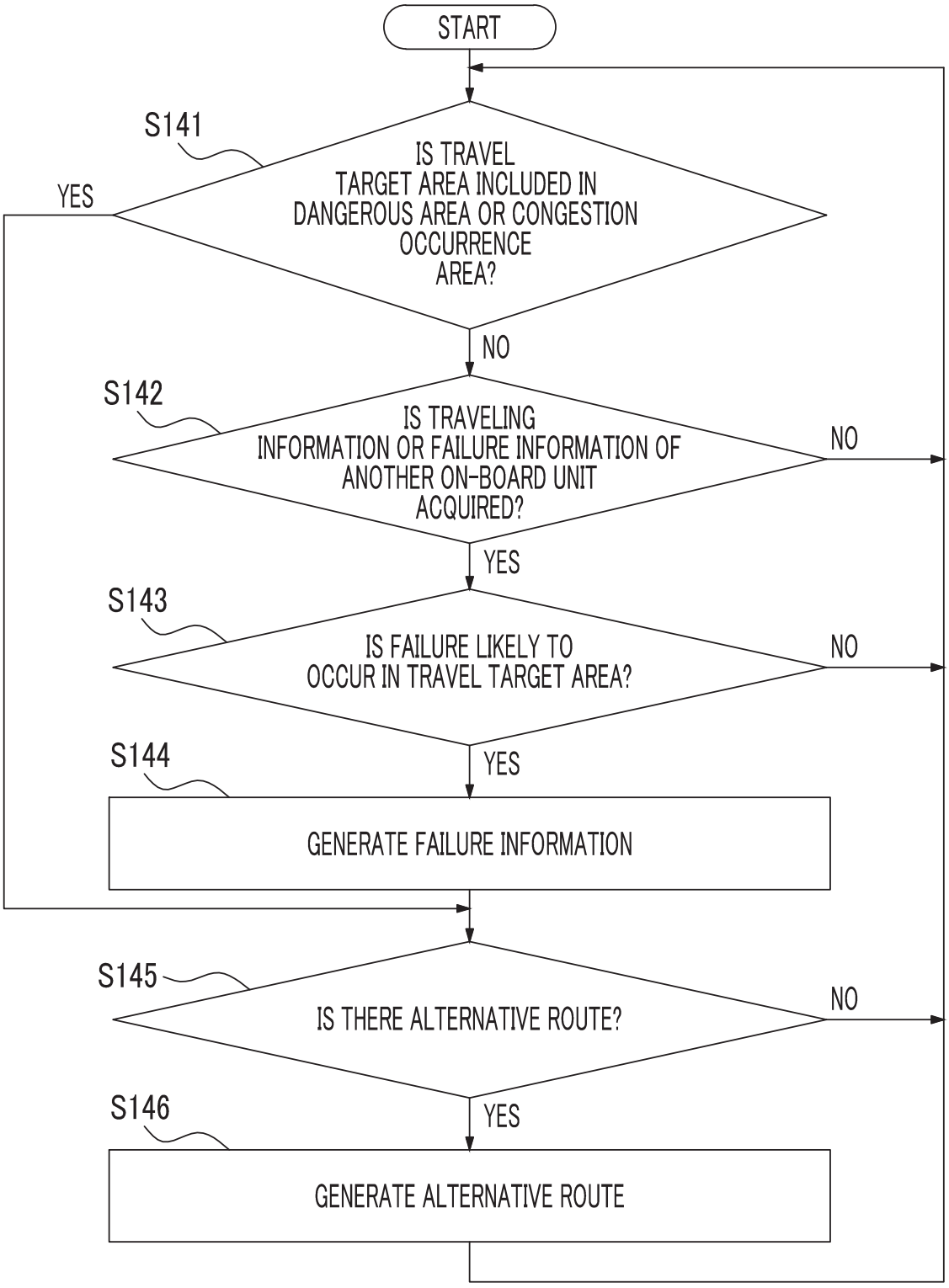

START
S141
IS TRAVEL TARGET AREA INCLUDED IN DANGEROUS AREA OR CONGESTION OCCURRENCE AREA?
YES
NO
S142
IS TRAVELING INFORMATION OR FAILURE INFORMATION OF ANOTHER ON-BOARD UNIT ACQUIRED?
NO
YES
S143
IS FAILURE LIKELY TO OCCUR IN TRAVEL TARGET AREA?
NO
YES
S144
GENERATE FAILURE INFORMATION
S145
IS THERE ALTERNATIVE ROUTE?
NO
YES
S146
GENERATE ALTERNATIVE ROUTE

FIG. 15

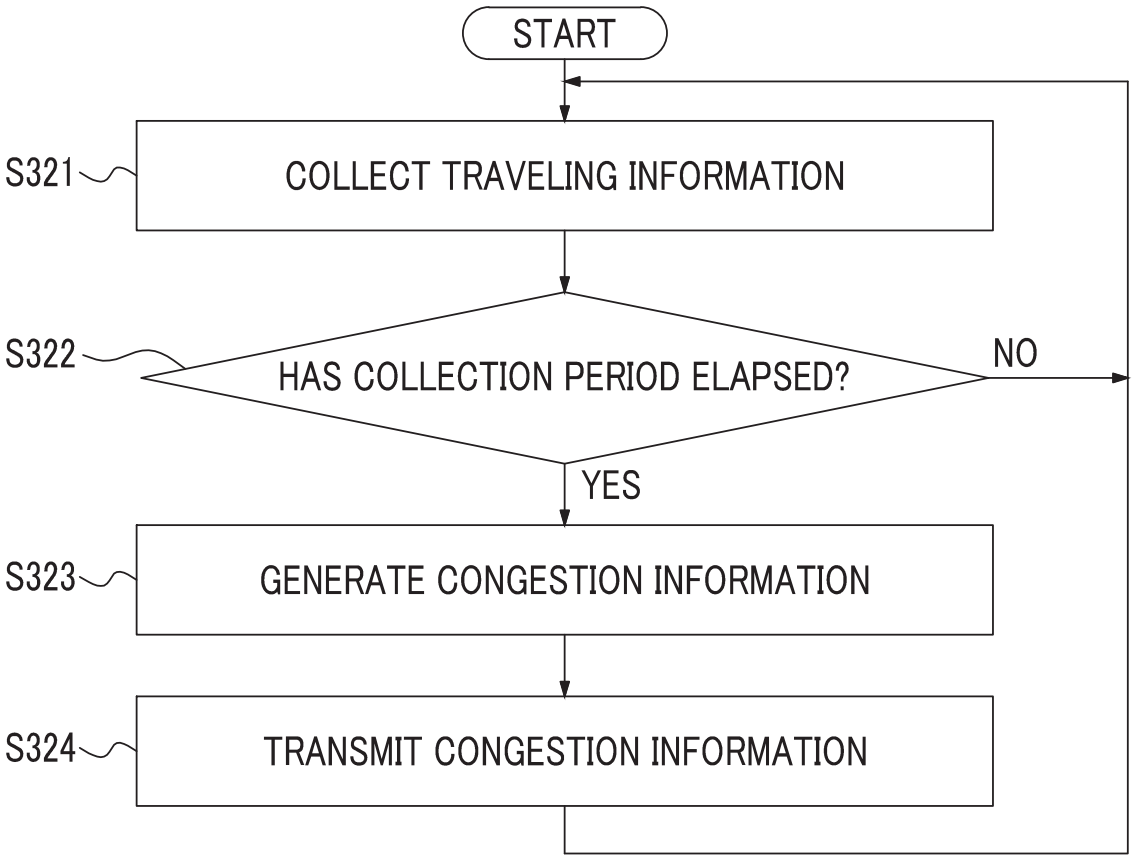
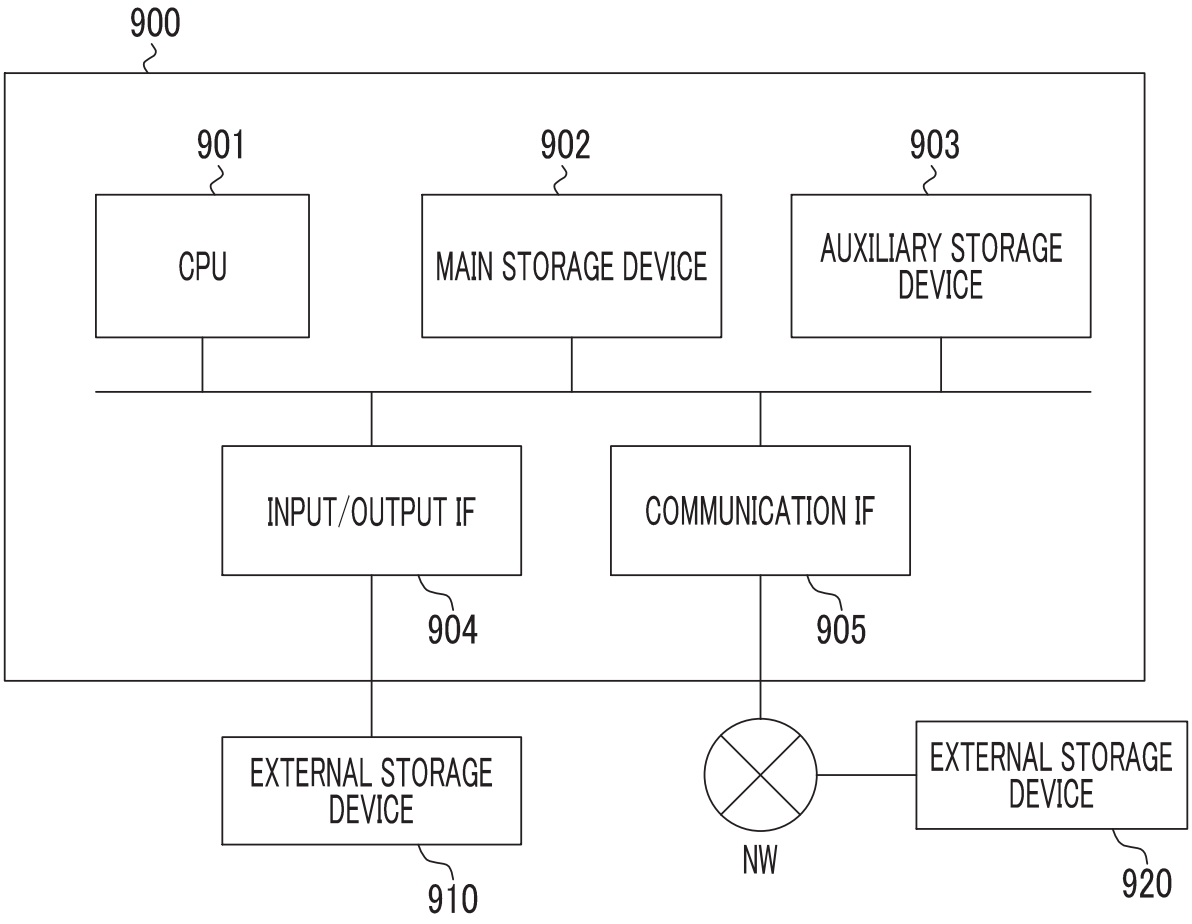

START
S321
COLLECT TRAVELING INFORMATION
S322
HAS COLLECTION PERIOD ELAPSED?
NO
YES
S323
GENERATE CONGESTION INFORMATION
S324
TRANSMIT CONGESTION INFORMATION

FIG. 16


900
901
902
903
CPU
MAIN STORAGE DEVICE
AUXILIARY STORAGE DEVICE
INPUT/OUTPUT IF
COMMUNICATION IF
904
905
EXTERNAL STORAGE DEVICE
910
NW
EXTERNAL STORAGE DEVICE
920