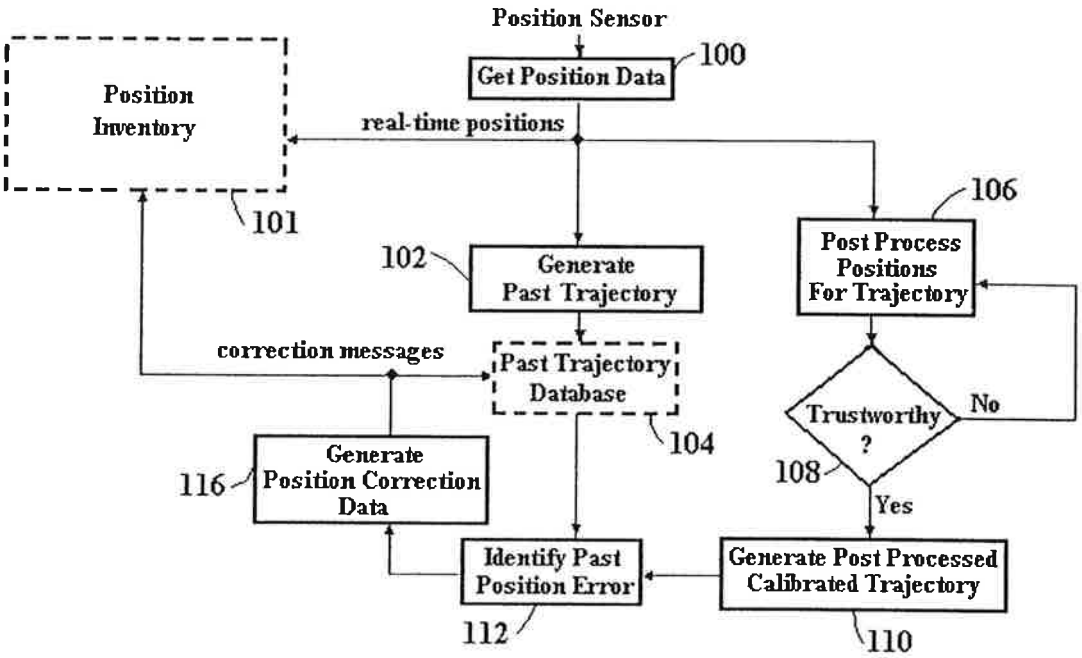
Position Sensor
Get Position Data
100
Position Inventory
real-time positions
101
102
Generate Past Trajectory
106
Post Process Positions For Trajectory
correction messages
Past Trajectory Database
104
Trustworthy ?
No
108
Yes
116
Generate Position Correction Data
Identify Past Position Error
112
Generate Post Processed Calibrated Trajectory
110

FIG. 1

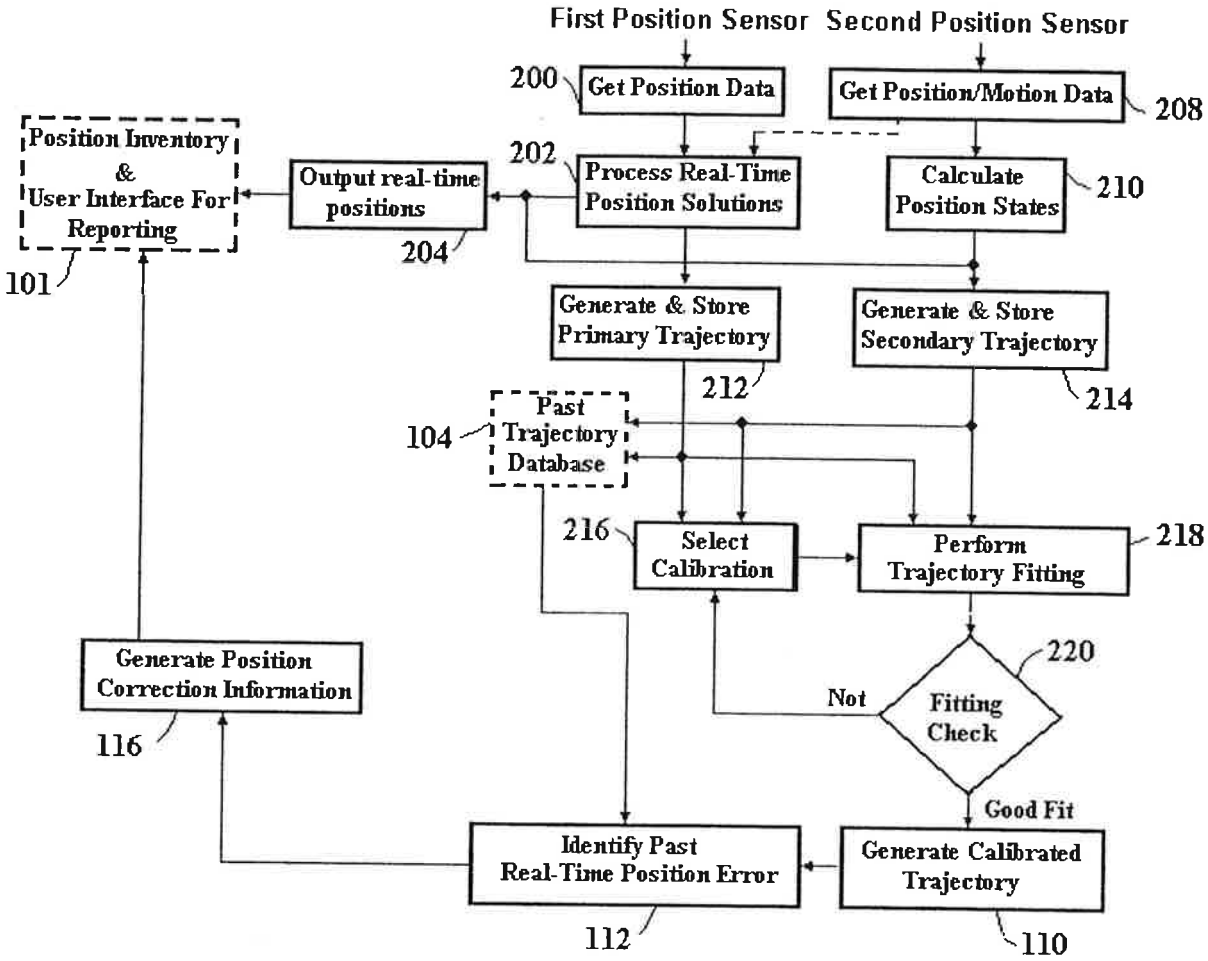
First Position Sensor
Second Position Sensor
200
Get Position Data
Get Position/Motion Data
208
Position Inventory & User Interface For Reporting
101
Output real-time positions
204
202
Process Real-Time Position Solutions
Calculate Position States
210
Generate & Store Primary Trajectory
212
Generate & Store Secondary Trajectory
214
Past Trajectory Database
104
216
Select Calibration
Perform Trajectory Fitting
218
220
Not
Fitting Check
Good Fit
Generate Position Correction Information
116
Identify Past Real-Time Position Error
112
Generate Calibrated Trajectory
110

FIG. 2

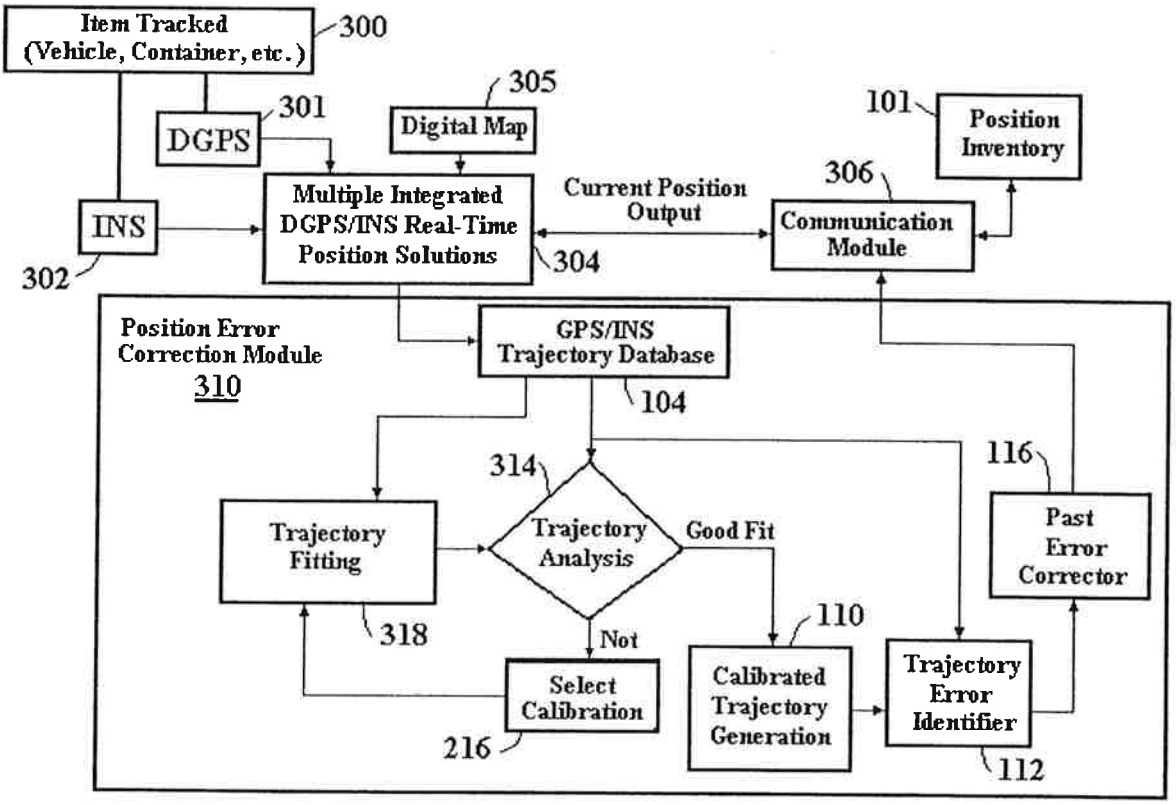
Item Tracked
(Vehicle, Container, etc.)
300
DGPS
301
Digital Map
305
101
Position
Inventory
INS
302
Multiple Integrated
DGPS/INS Real-Time
Position Solutions
304
Current Position
Output
306
Communication
Module
Position Error
Correction Module
310
GPS/INS
Trajectory Database
104
314
116
Trajectory
Fitting
Trajectory
Analysis
Good Fit
Past
Error
Corrector
318
Not
110
Select
Calibration
216
Calibrated
Trajectory
Generation
Trajectory
Error
Identifier
112

FIG. 3

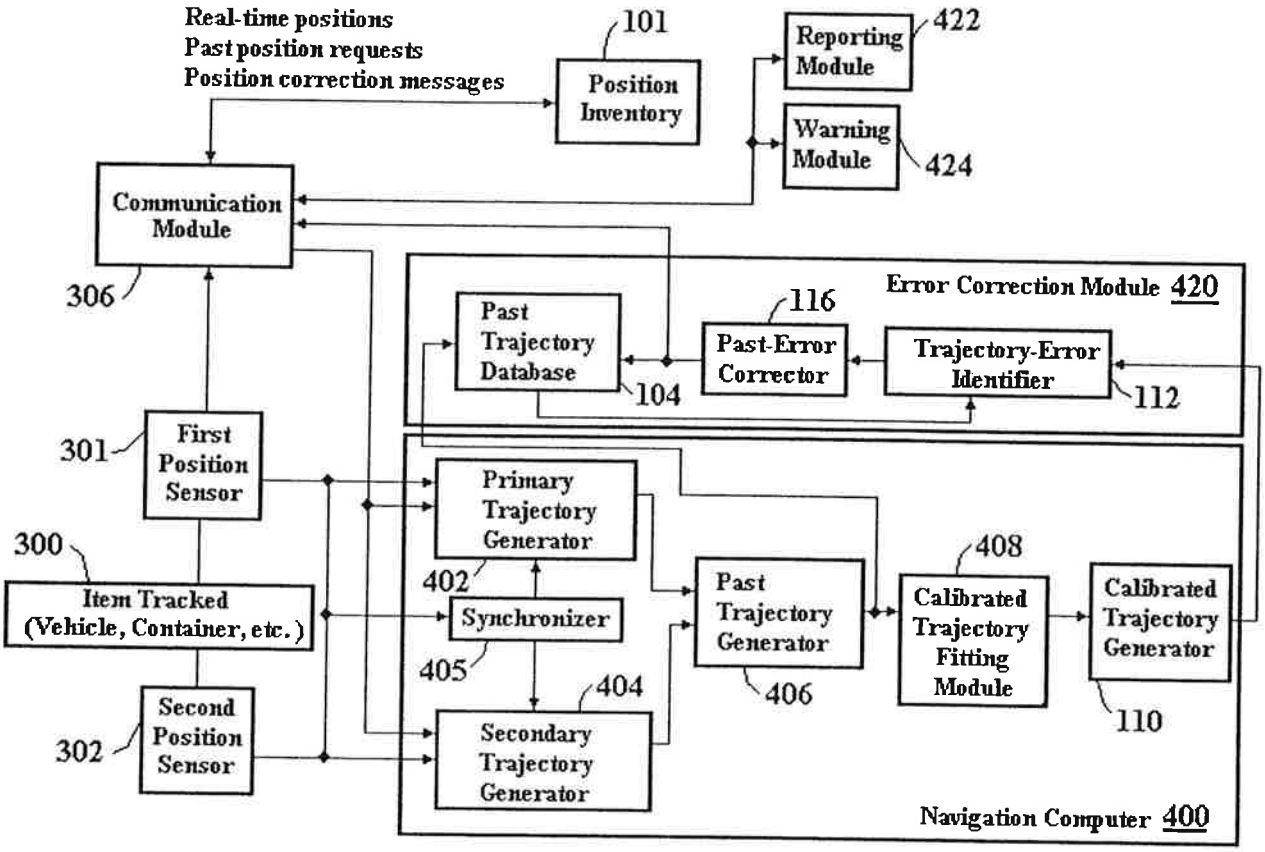
Real-time positions
Past position requests
Position correction messages
101
Position Inventory
Reporting Module
422
Warning Module
424
Communication Module
306
Error Correction Module 420
Past Trajectory Database
104
116
Past-Error Corrector
Trajectory-Error Identifier
112
301
First Position Sensor
Primary Trajectory Generator
402
300
Item Tracked (Vehicle, Container, etc.)
Synchronizer
405
404
Past Trajectory Generator
406
408
Calibrated Trajectory Fitting Module
Calibrated Trajectory Generator
110
Second Position Sensor
302
Secondary Trajectory Generator
Navigation Computer 400

FIG. 4

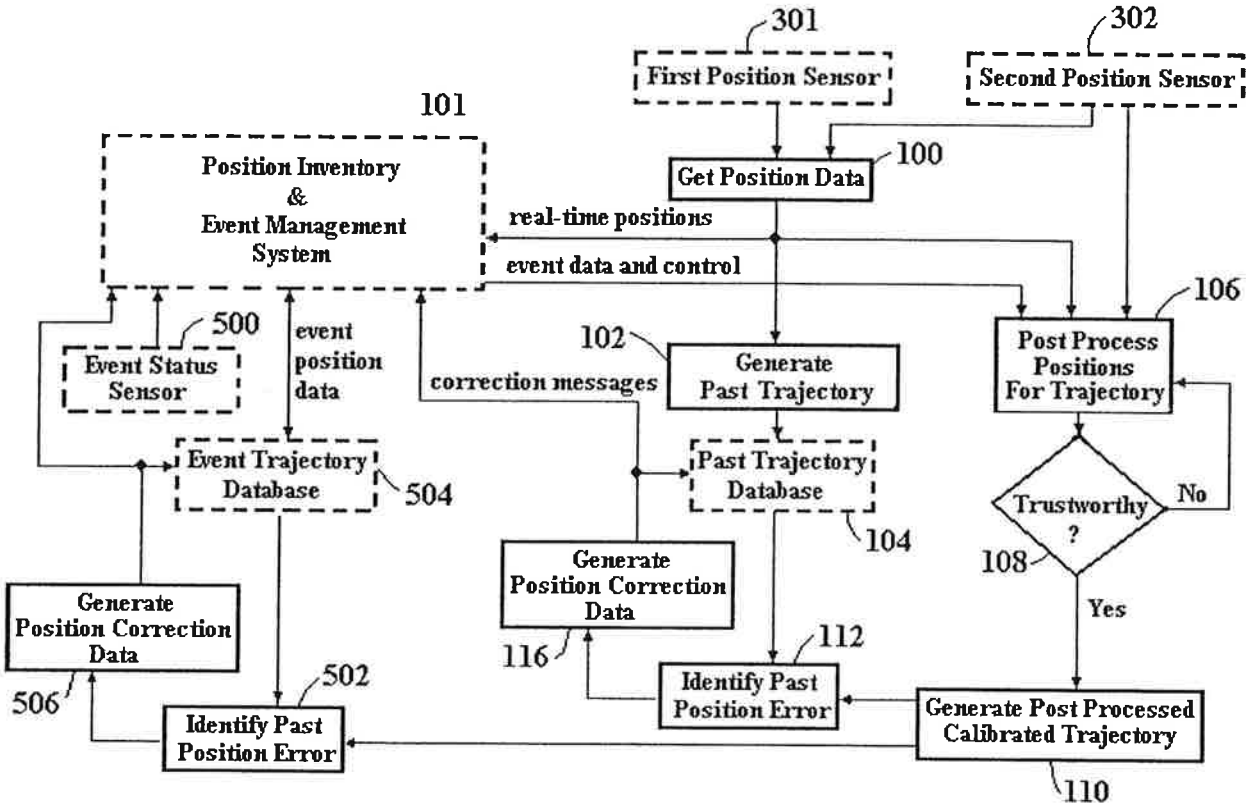
301
First Position Sensor
302
Second Position Sensor
101
Position Inventory & Event Management System
Get Position Data
100
real-time positions
event data and control
106
Post Process Positions For Trajectory
500
Event Status Sensor
event position data
102
Generate Past Trajectory
correction messages
Event Trajectory Database
504
Past Trajectory Database
104
Trustworthy ?
No
108
Yes
Generate Position Correction Data
Generate Position Correction Data
116
112
Identify Past Position Error
Generate Post Processed Calibrated Trajectory
506
502
Identify Past Position Error
110

FIG. 5

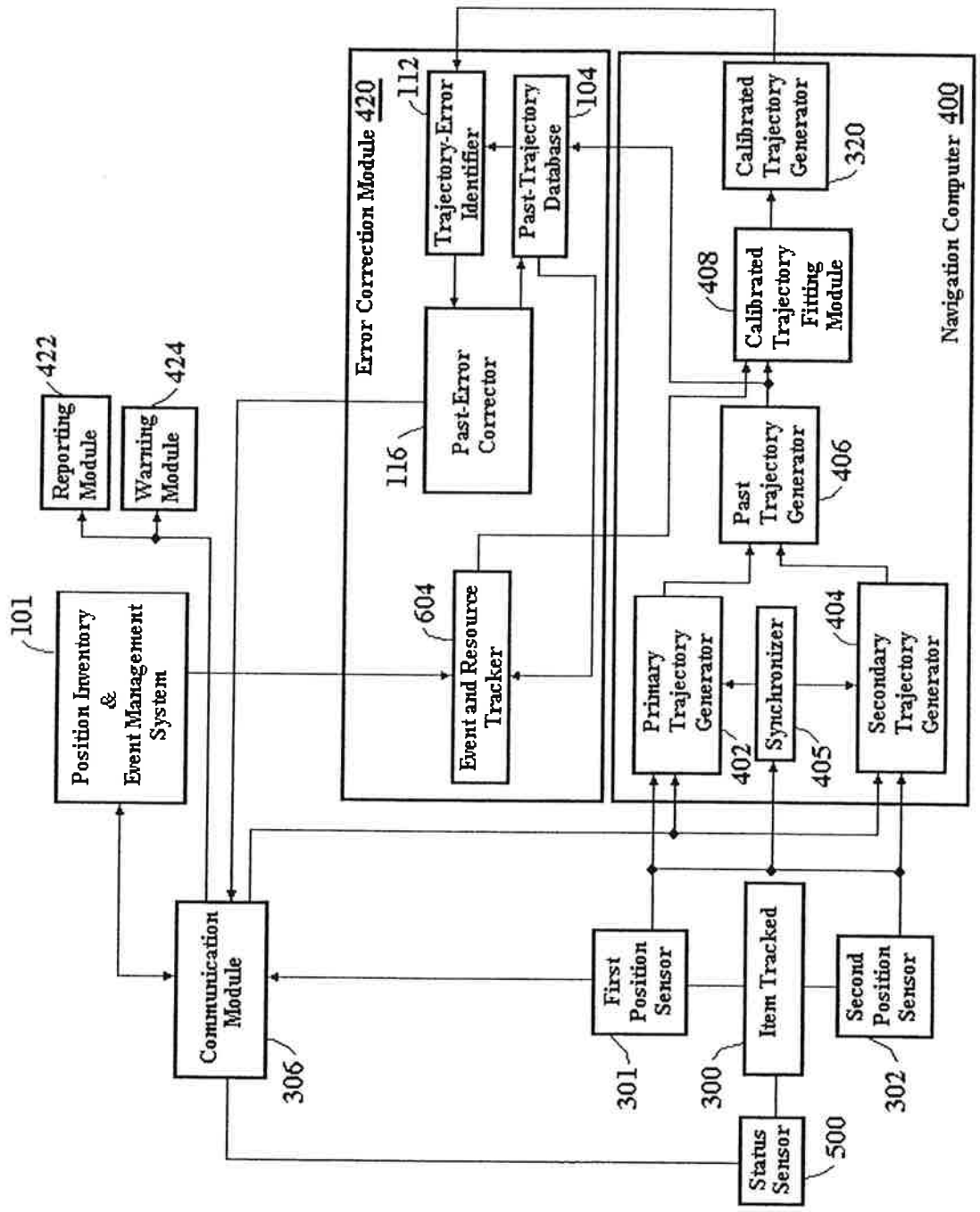
Navigation Computer 400
Error Correction Module 420
Position Inventory & Event Management System
101
Reporting Module
422
Warning Module
424
Communication Module
306
Trajectory-Error Identifier
112
Past-Trajectory Database
104
Past-Error Corrector
116
Event and Resource Tracker
604
Primary Trajectory Generator
402
Synchronizer
405
Secondary Trajectory Generator
404
Past Trajectory Generator
406
Calibrated Trajectory Fitting Module
408
Calibrated Trajectory Generator
320
First Position Sensor
301
Item Tracked
300
Second Position Sensor
302
Status Sensor
500

FIG. 6

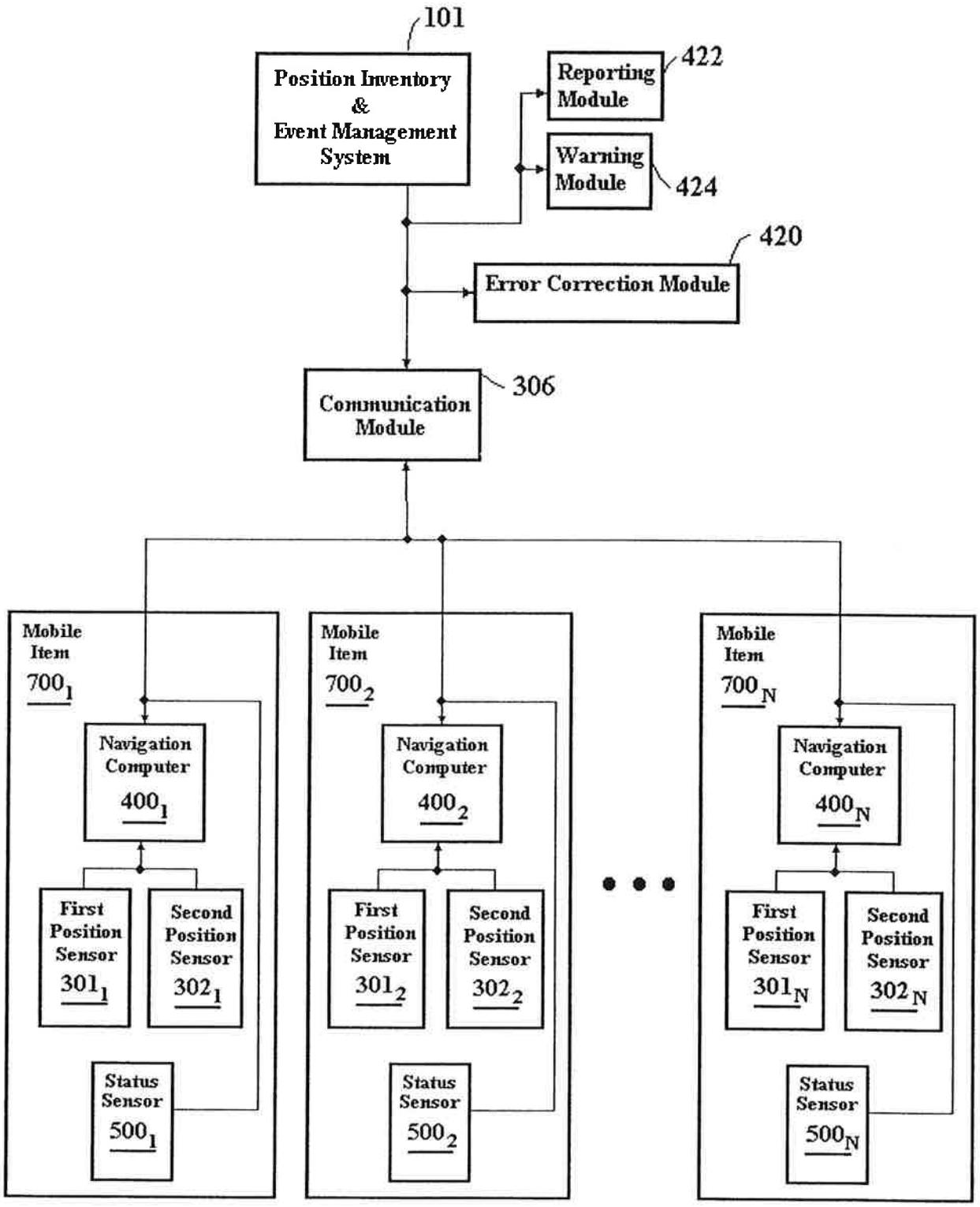
101
Position Inventory & Event Management System
Reporting Module
422
Warning Module
424
420
Error Correction Module
Communication Module
306
Mobile Item 700_1
Navigation Computer 400_1
First Position Sensor 301_1
Second Position Sensor 302_1
Status Sensor 500_1
Mobile Item 700_2
Navigation Computer 400_2
First Position Sensor 301_2
Second Position Sensor 302_2
Status Sensor 500_2
Mobile Item 700_N
Navigation Computer 400_N
First Position Sensor 301_N
Second Position Sensor 302_N
Status Sensor 500_N

FIG. 7