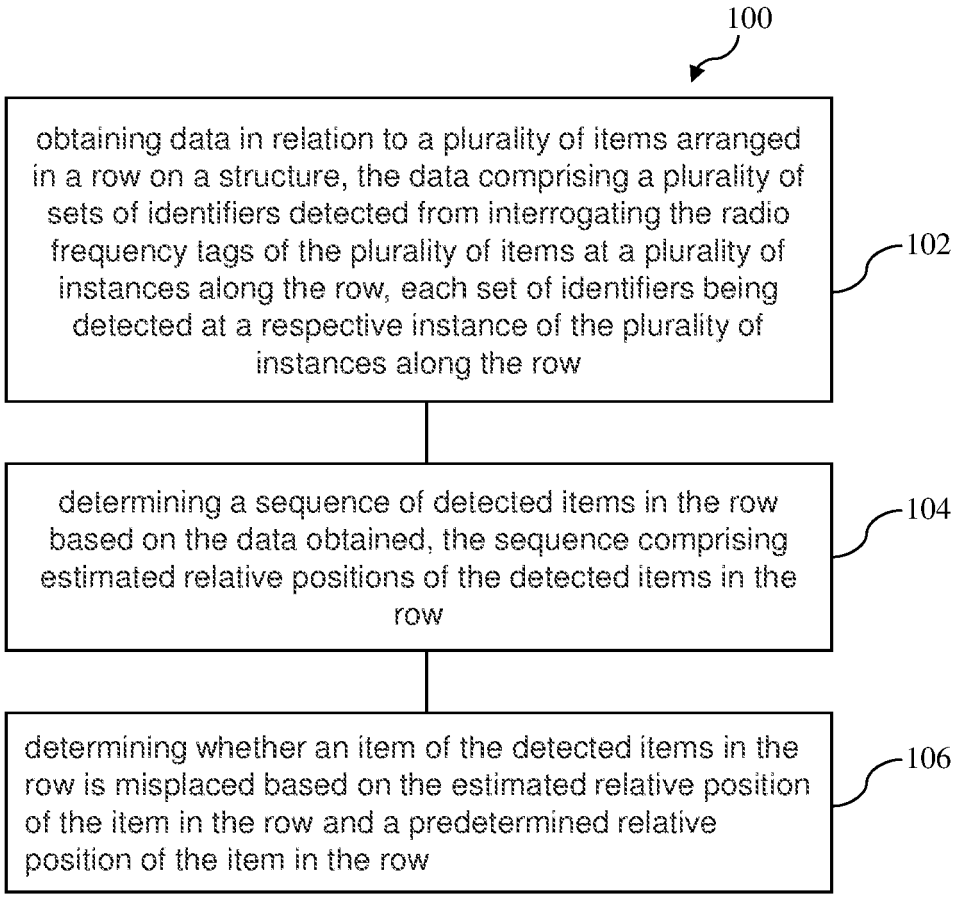
100
obtaining data in relation to a plurality of items arranged in a row on a structure, the data comprising a plurality of sets of identifiers detected from interrogating the radio frequency tags of the plurality of items at a plurality of instances along the row, each set of identifiers being detected at a respective instance of the plurality of instances along the row
102
determining a sequence of detected items in the row based on the data obtained, the sequence comprising estimated relative positions of the detected items in the row
104
determining whether an item of the detected items in the row is misplaced based on the estimated relative position of the item in the row and a predetermined relative position of the item in the row
106

FIG. 1

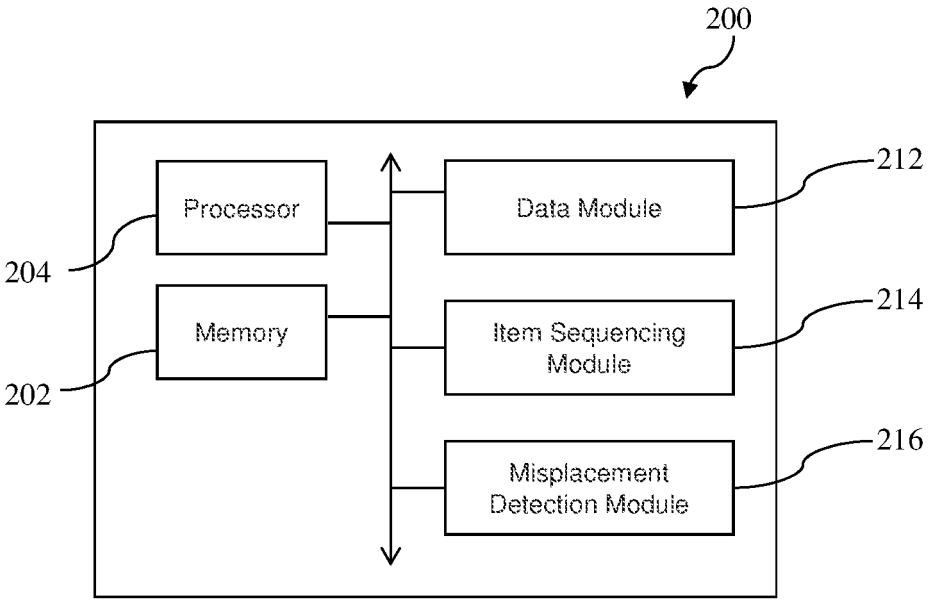
200
Processor
Memory
Data Module
Item Sequencing Module
Misplacement Detection Module
204
202
212
214
216

FIG. 2

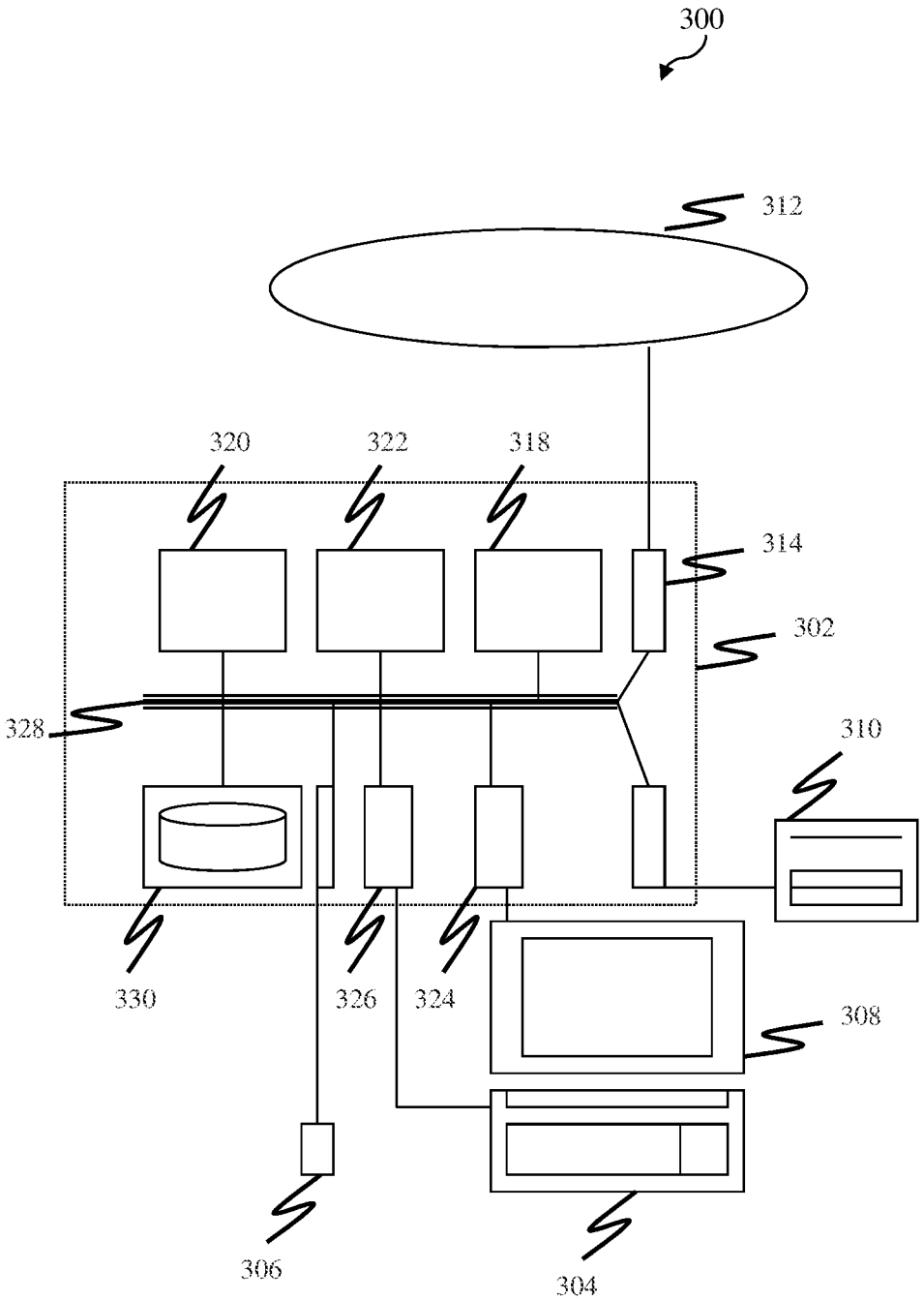

FIG. 3

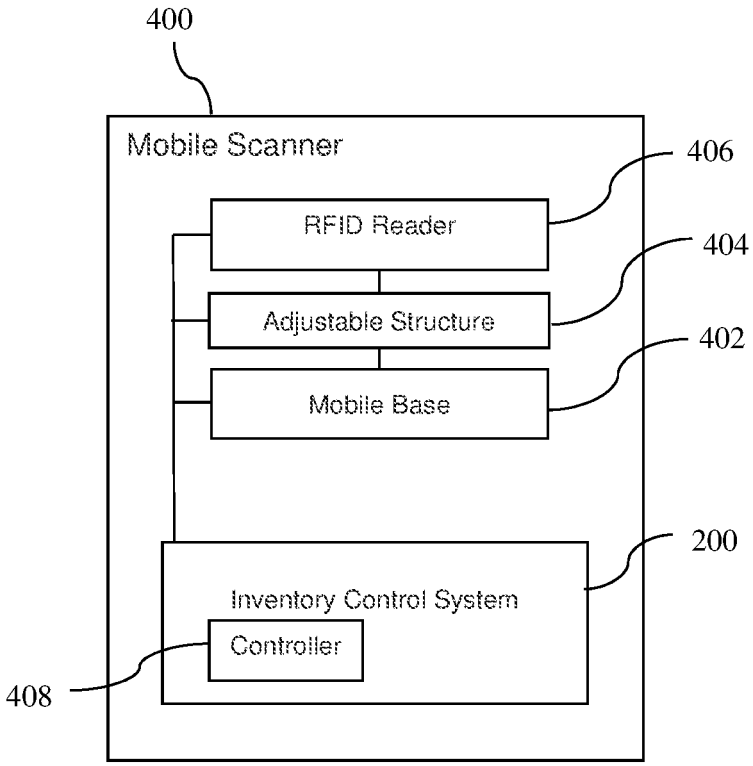
400
Mobile Scanner
406
RFID Reader
404
Adjustable Structure
402
Mobile Base
200
Inventory Control System
Controller
408

FIG. 4

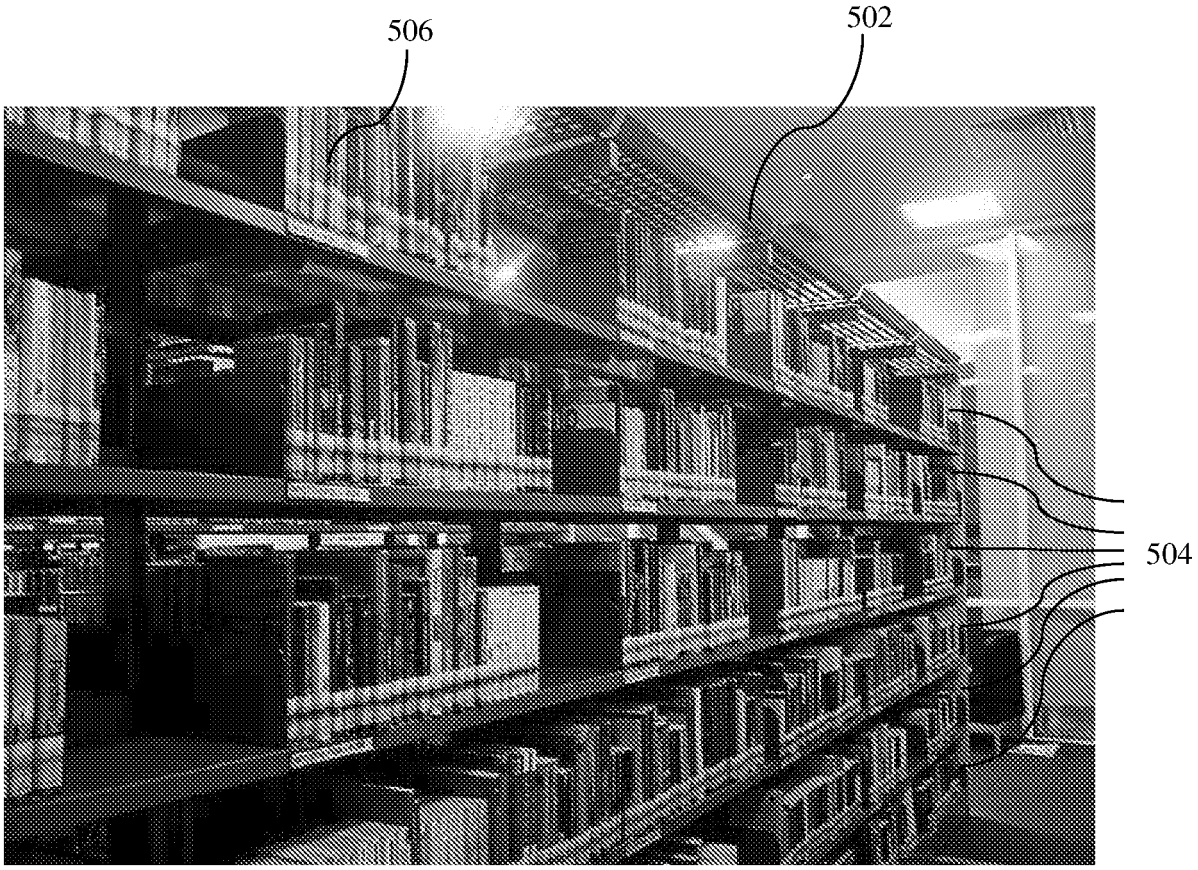

FIG. 5

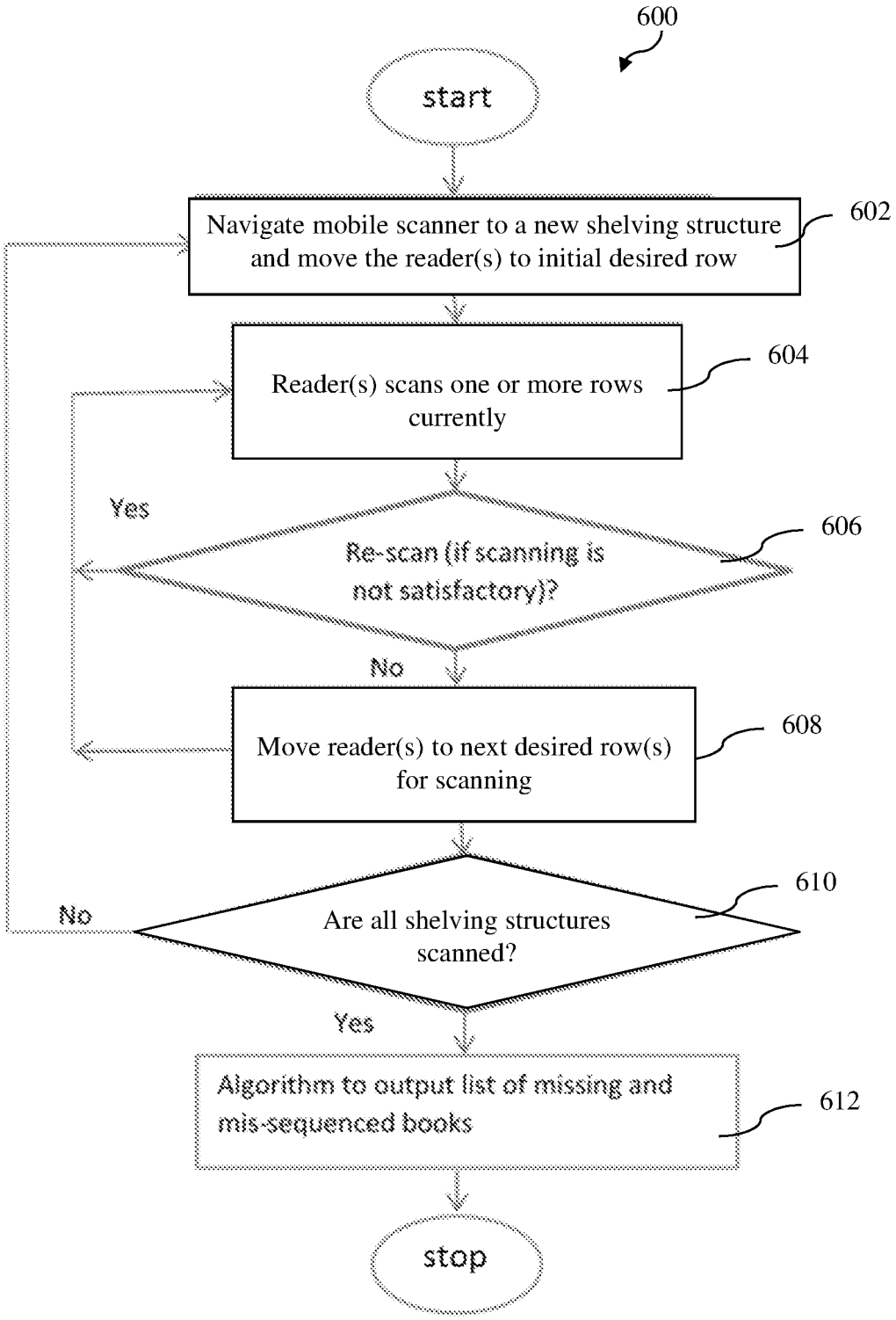
600
start
Navigate mobile scanner to a new shelving structure and move the reader(s) to initial desired row
602
Reader(s) scans one or more rows currently
604
Yes
Re-scan (if scanning is not satisfactory)?
606
No
Move reader(s) to next desired row(s) for scanning
608
No
Are all shelving structures scanned?
610
Yes
Algorithm to output list of missing and mis-sequenced books
612
stop

FIG. 6

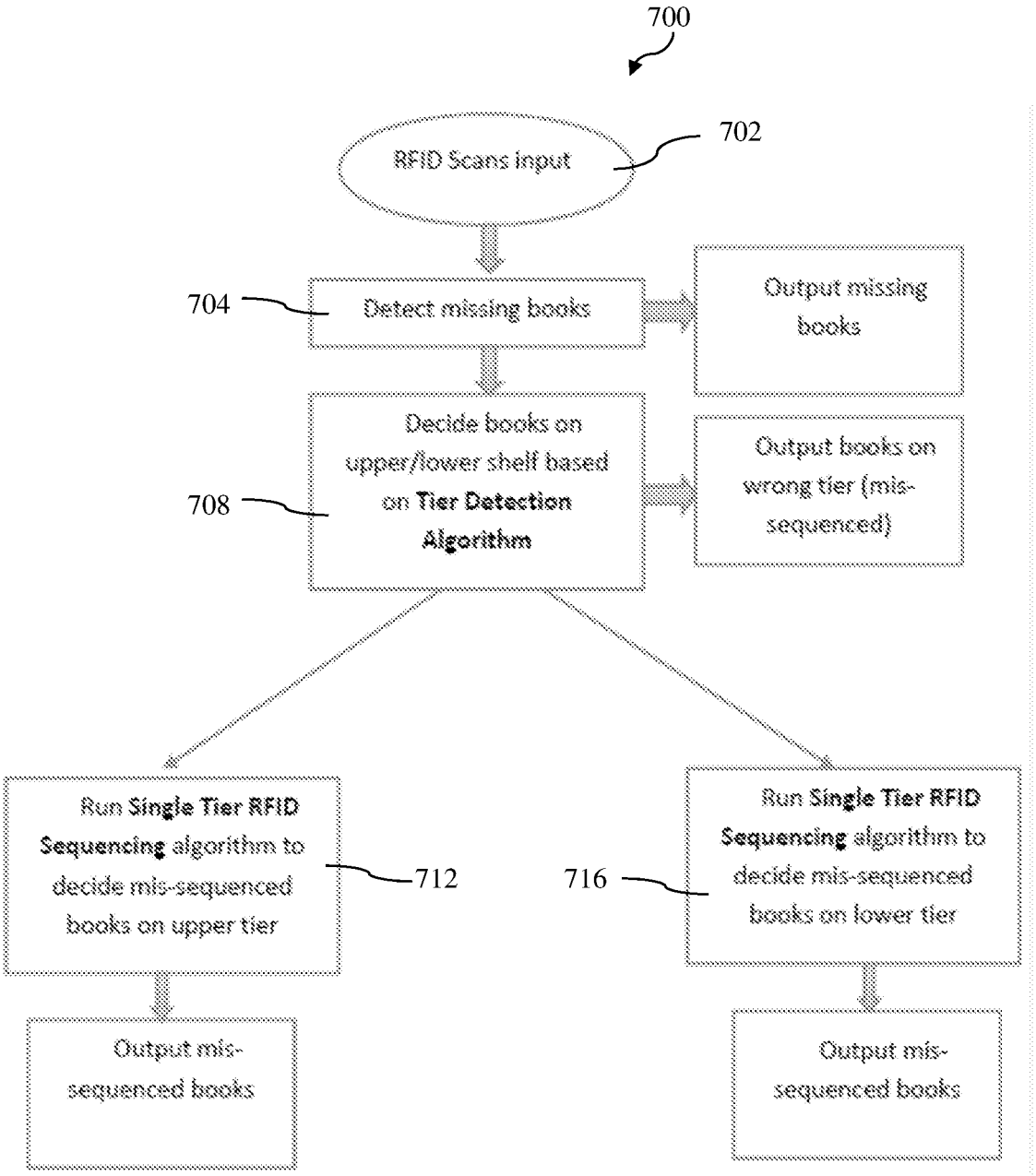
700
RFID Scans input
702
704
Detect missing books
Output missing books
Decide books on upper/lower shelf based on Tier Detection Algorithm
708
Output books on wrong tier (mis-sequenced)
Run Single Tier RFID Sequencing algorithm to decide mis-sequenced books on upper tier
712
716
Run Single Tier RFID Sequencing algorithm to decide mis-sequenced books on lower tier
Output mis-sequenced books
Output mis-sequenced books

FIG. 7

Runs	:	Tags
1	:	T_1, T_2, T_4, T_5
2	:	$T_1, T_2, T_3, T_5, T_6, T_8, T_9$
	⋮	
x	:	T_{90}, T_{91}
	⋮	
M	:	T_{195}, T_{196}

FIG. 8

Antenna	:	Positions of tag
Ant. 1	:	x_1, x_2, x_3, x_4, x_5
Ant. 2	:	z_1, z_2, z_3

FIG. 9

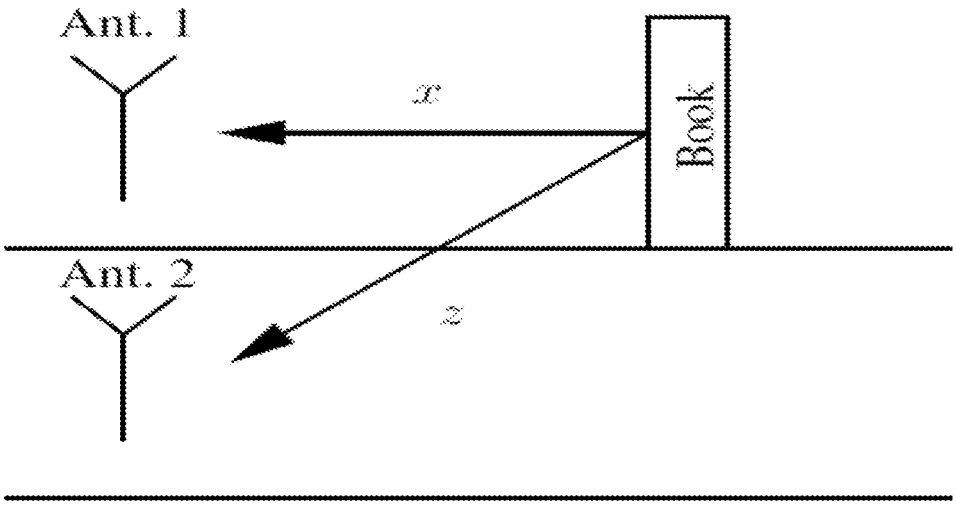

FIG. 10

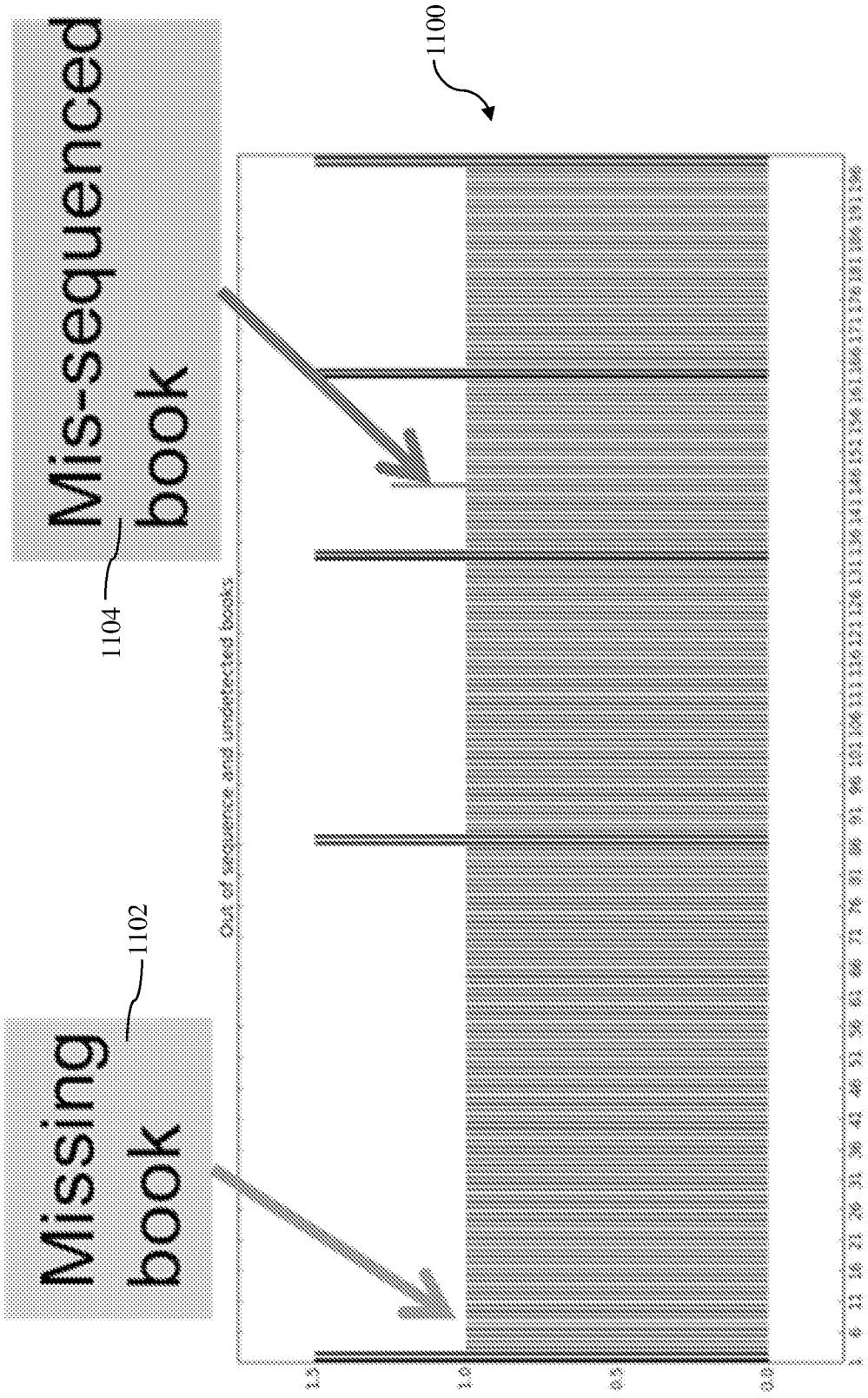
1100
Mis-sequenced book
1104
Missing book
1102
Out of sequence and unshelved books

FIG. 11