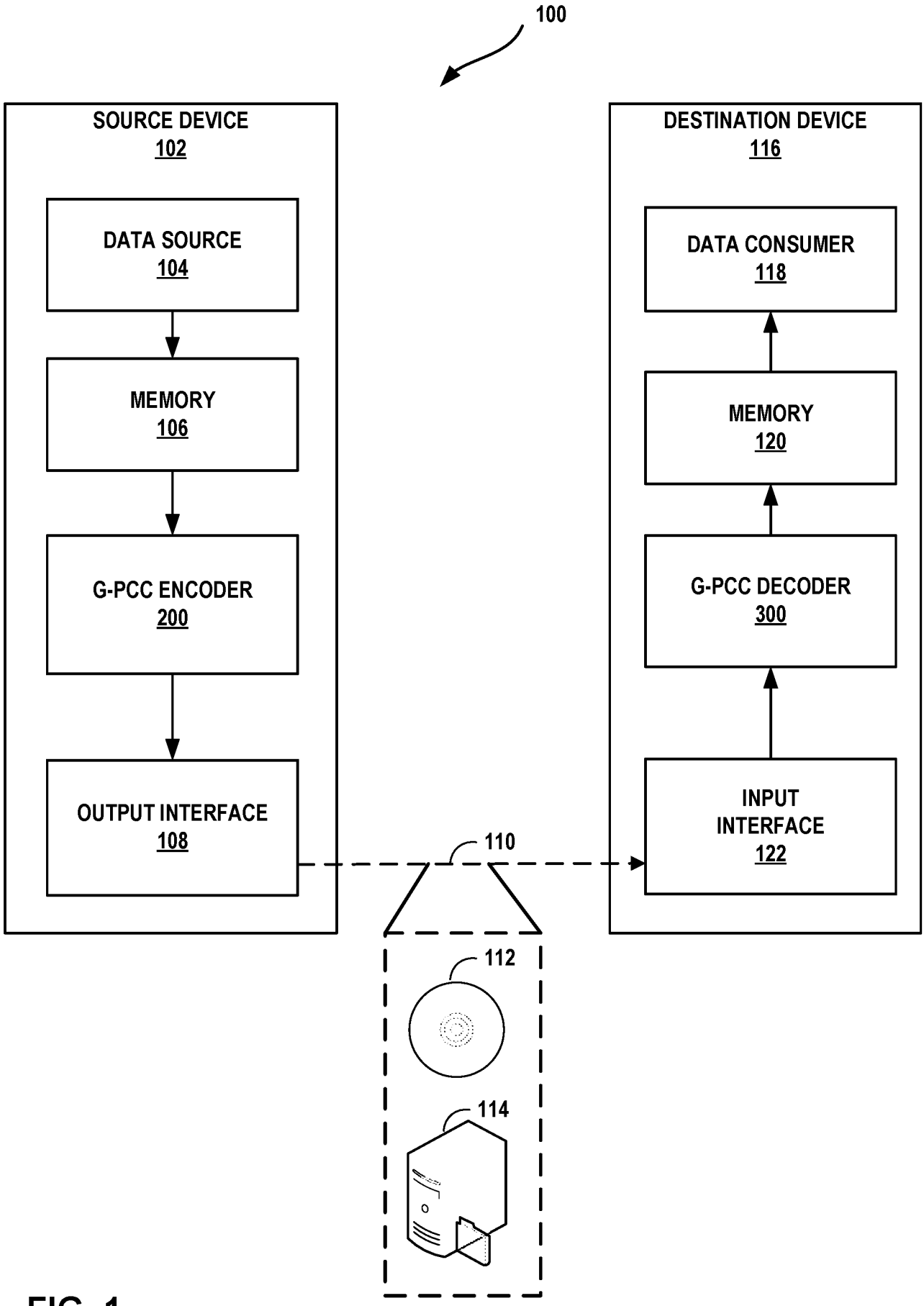

100
SOURCE DEVICE
102
DATA SOURCE
104
MEMORY
106
G-PCC ENCODER
200
OUTPUT INTERFACE
108
110
112
114
DESTINATION DEVICE
116
DATA CONSUMER
118
MEMORY
120
G-PCC DECODER
300
INPUT
INTERFACE
122

FIG. 1

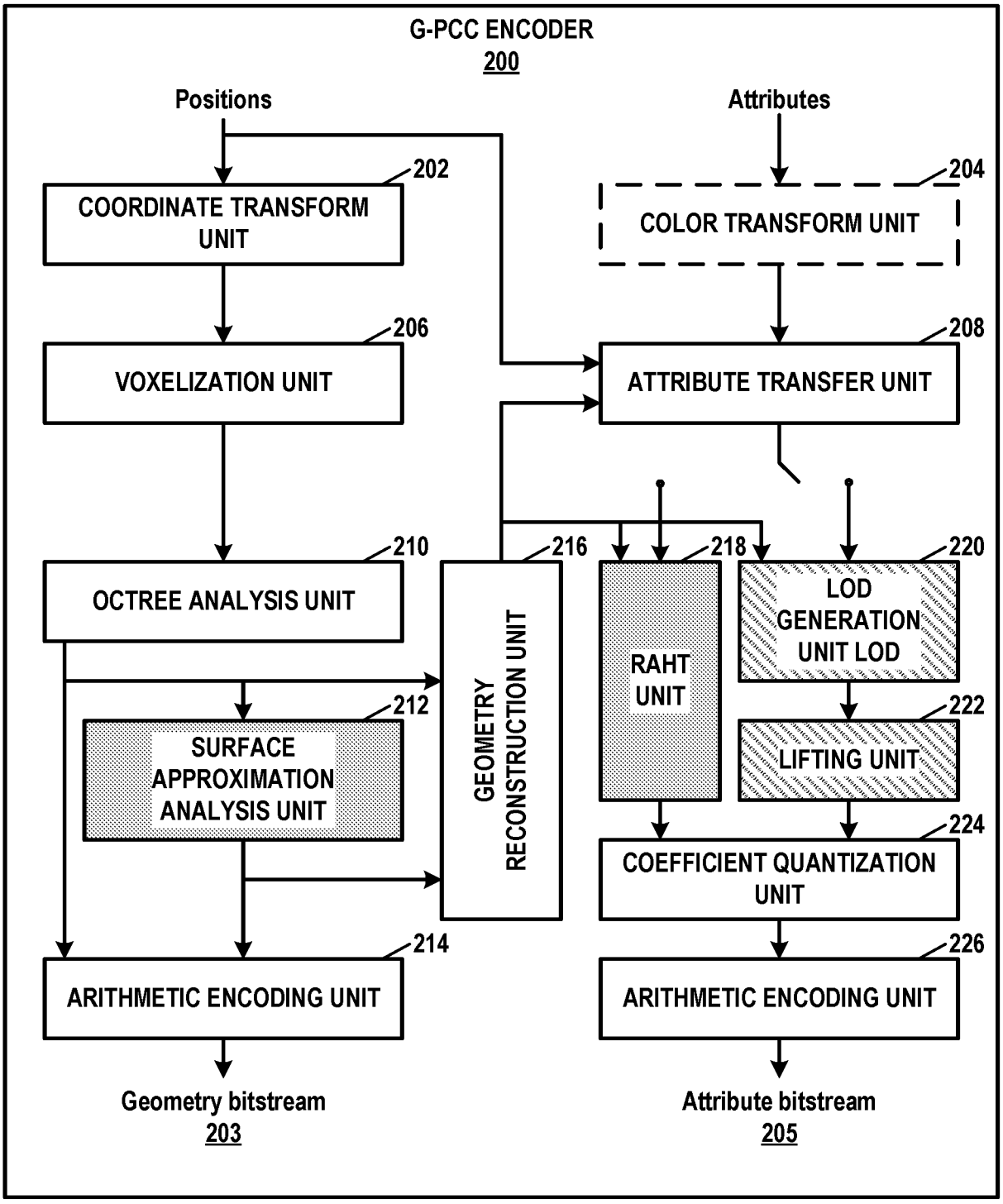

G-PCC ENCODER
200
Positions
Attributes
202
COORDINATE TRANSFORM UNIT
204
COLOR TRANSFORM UNIT
206
VOXELIZATION UNIT
208
ATTRIBUTE TRANSFER UNIT
210
OCTREE ANALYSIS UNIT
216
GEOMETRY RECONSTRUCTION UNIT
218
RAHT UNIT
220
LOD GENERATION UNIT LOD
212
SURFACE APPROXIMATION ANALYSIS UNIT
222
LIFTING UNIT
224
COEFFICIENT QUANTIZATION UNIT
214
ARITHMETIC ENCODING UNIT
226
ARITHMETIC ENCODING UNIT
Geometry bitstream
203
Attribute bitstream
205

FIG. 2

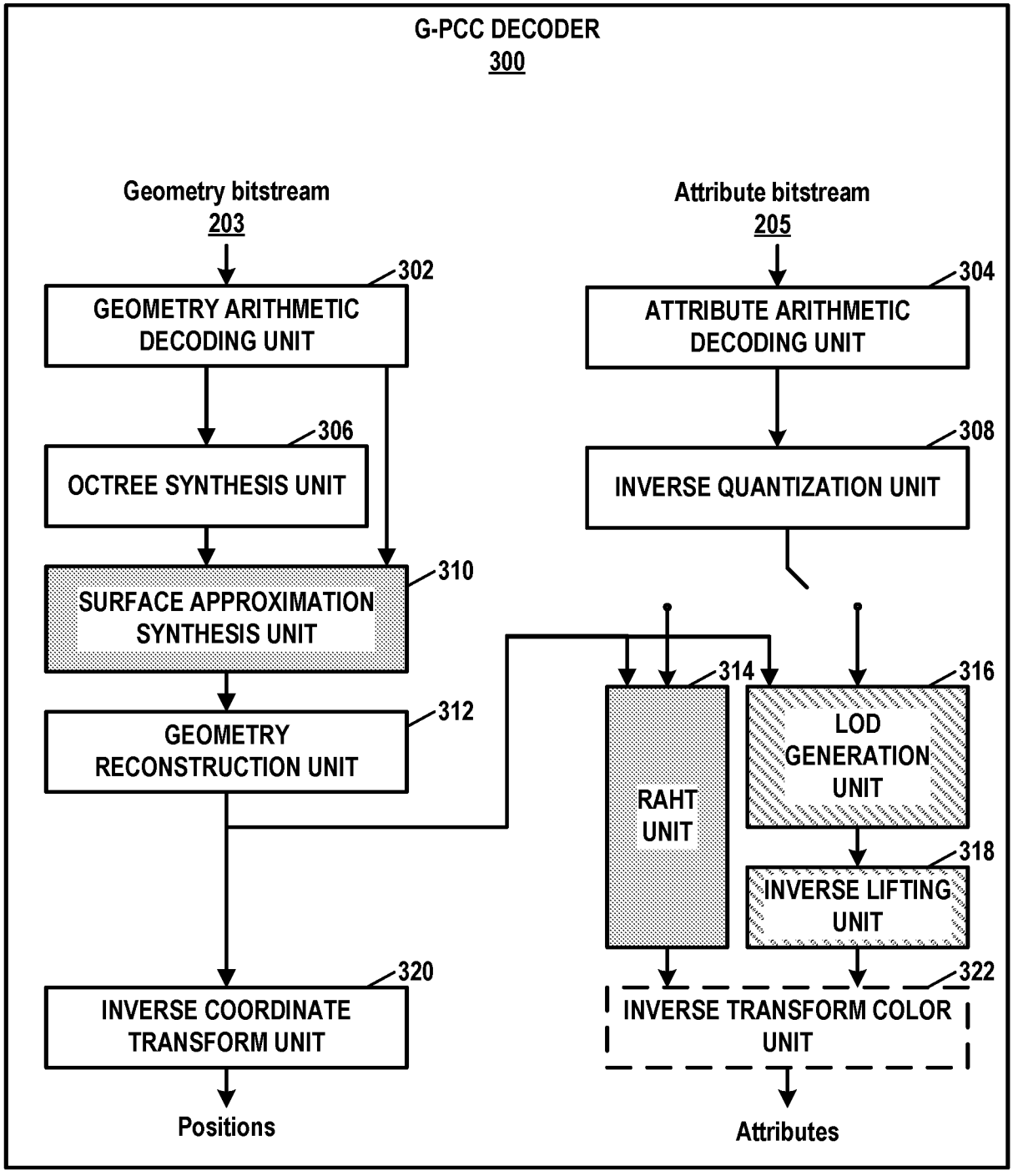

G-PCC DECODER
300
Geometry bitstream
203
Attribute bitstream
205
302
GEOMETRY ARITHMETIC DECODING UNIT
304
ATTRIBUTE ARITHMETIC DECODING UNIT
306
OCTREE SYNTHESIS UNIT
308
INVERSE QUANTIZATION UNIT
310
SURFACE APPROXIMATION SYNTHESIS UNIT
312
GEOMETRY RECONSTRUCTION UNIT
314
RAHT UNIT
316
LOD GENERATION UNIT
318
INVERSE LIFTING UNIT
320
INVERSE COORDINATE TRANSFORM UNIT
322
INVERSE TRANSFORM COLOR UNIT
Positions
Attributes

FIG. 3

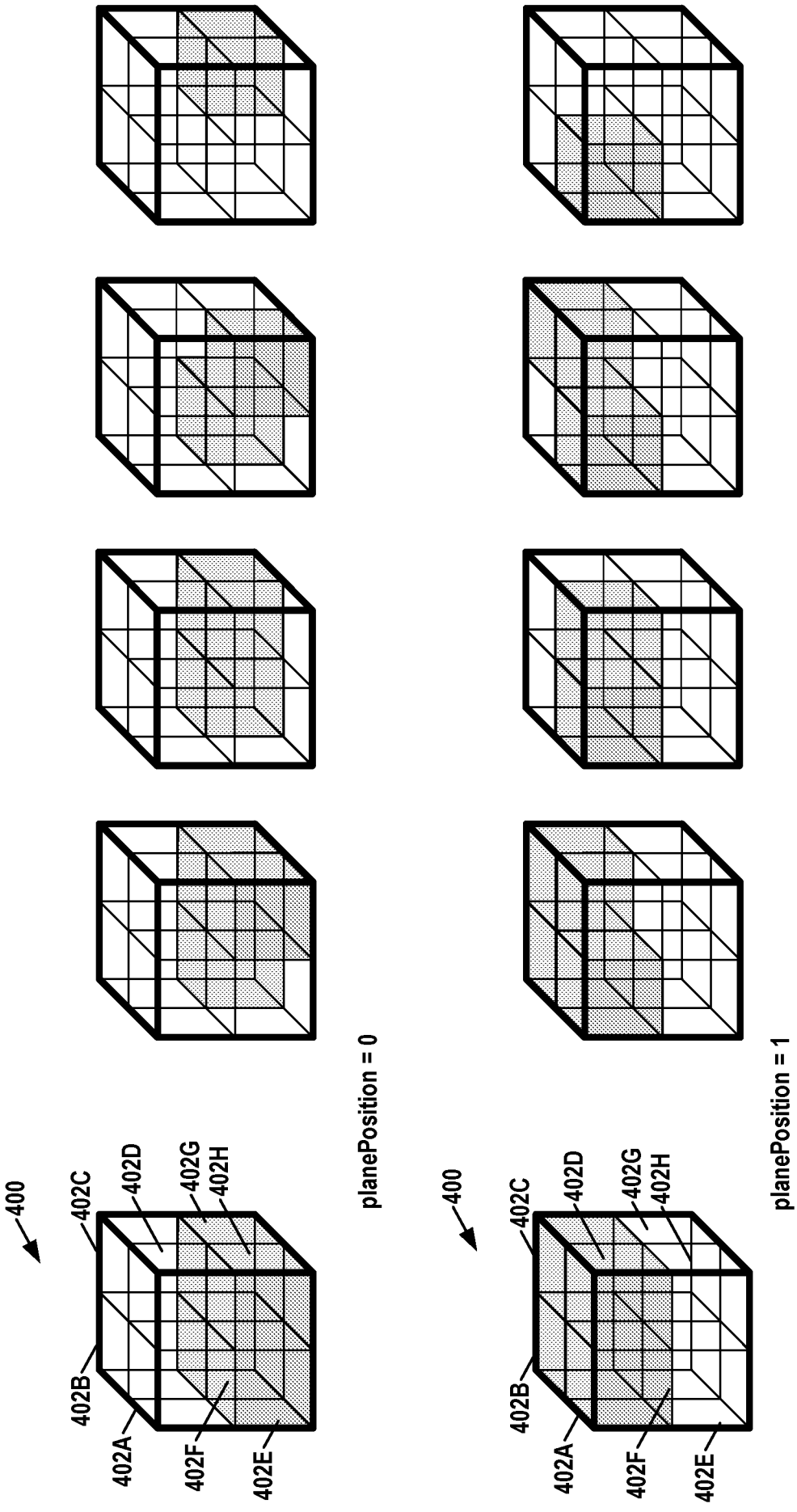

400
402C
402D
402G
402H
402B
402A
402F
402E
planePosition = 0
400
402C
402D
402G
402H
402B
402A
402F
402E
planePosition = 1

FIG. 4

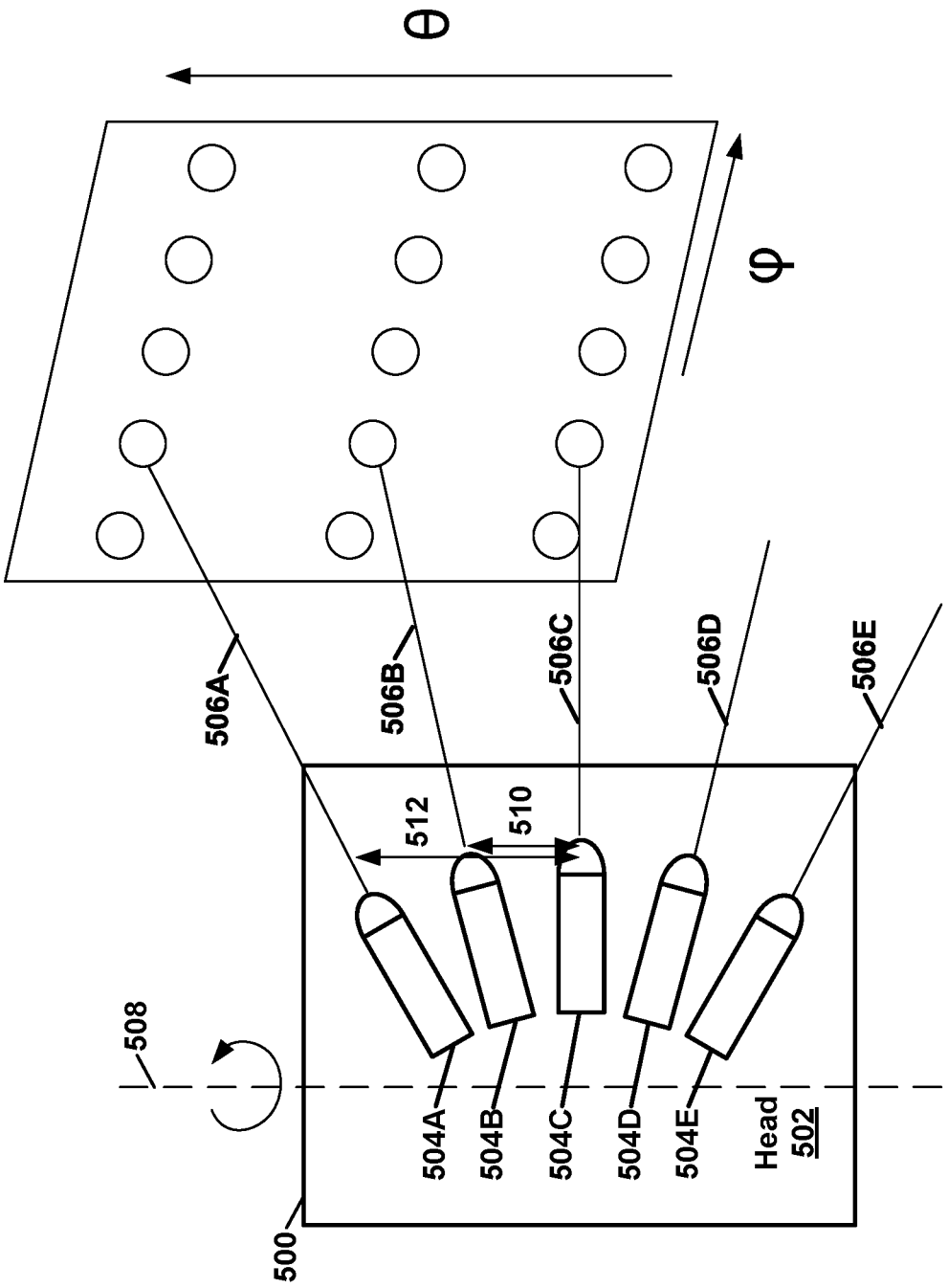

θ
φ
506A
506B
506C
506D
506E
512
510
508
504A
504B
504C
504D
504E
Head
502
500

FIG. 5

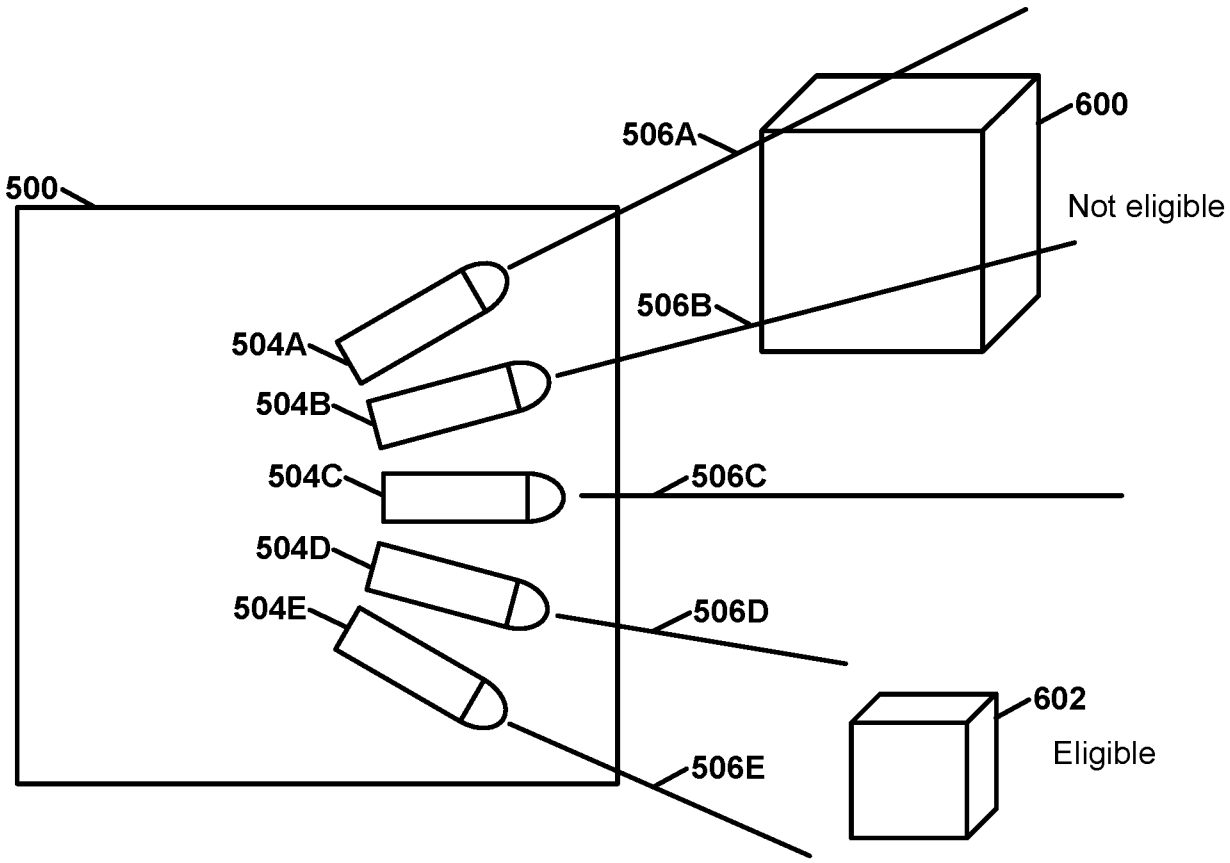

500
506A
600
Not eligible
506B
504A
504B
504C
506C
504D
504E
506D
602
Eligible
506E

FIG. 6

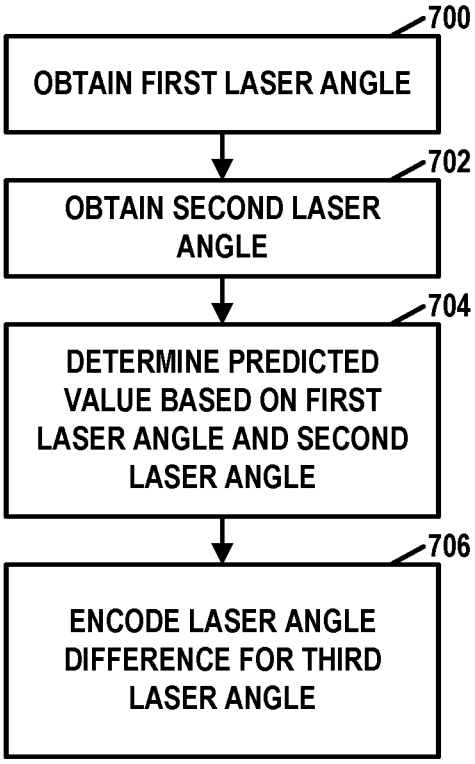

700
OBTAIN FIRST LASER ANGLE
702
OBTAIN SECOND LASER ANGLE
704
DETERMINE PREDICTED VALUE BASED ON FIRST LASER ANGLE AND SECOND LASER ANGLE
706
ENCODE LASER ANGLE DIFFERENCE FOR THIRD LASER ANGLE

FIG. 7A

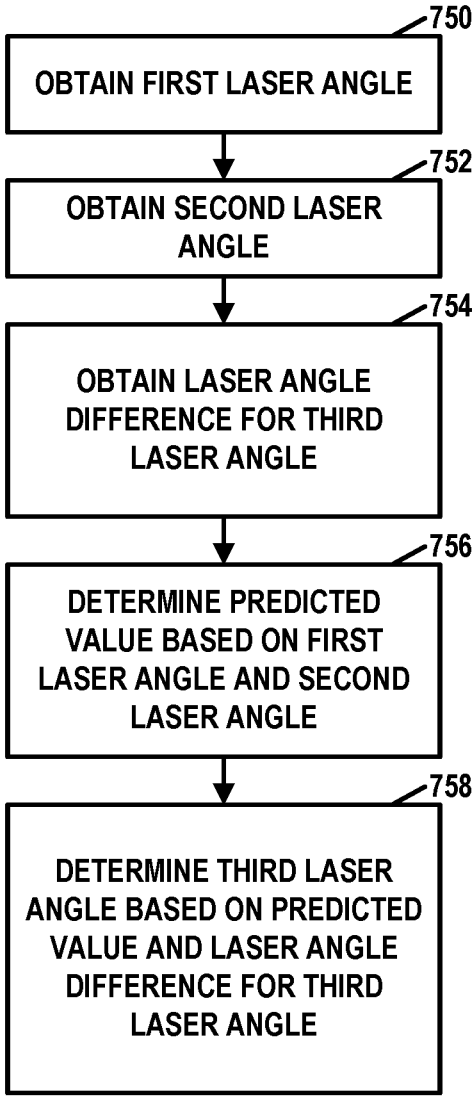

750
OBTAIN FIRST LASER ANGLE
752
OBTAIN SECOND LASER ANGLE
754
OBTAIN LASER ANGLE DIFFERENCE FOR THIRD LASER ANGLE
756
DETERMINE PREDICTED VALUE BASED ON FIRST LASER ANGLE AND SECOND LASER ANGLE
758
DETERMINE THIRD LASER ANGLE BASED ON PREDICTED VALUE AND LASER ANGLE DIFFERENCE FOR THIRD LASER ANGLE

FIG. 7B

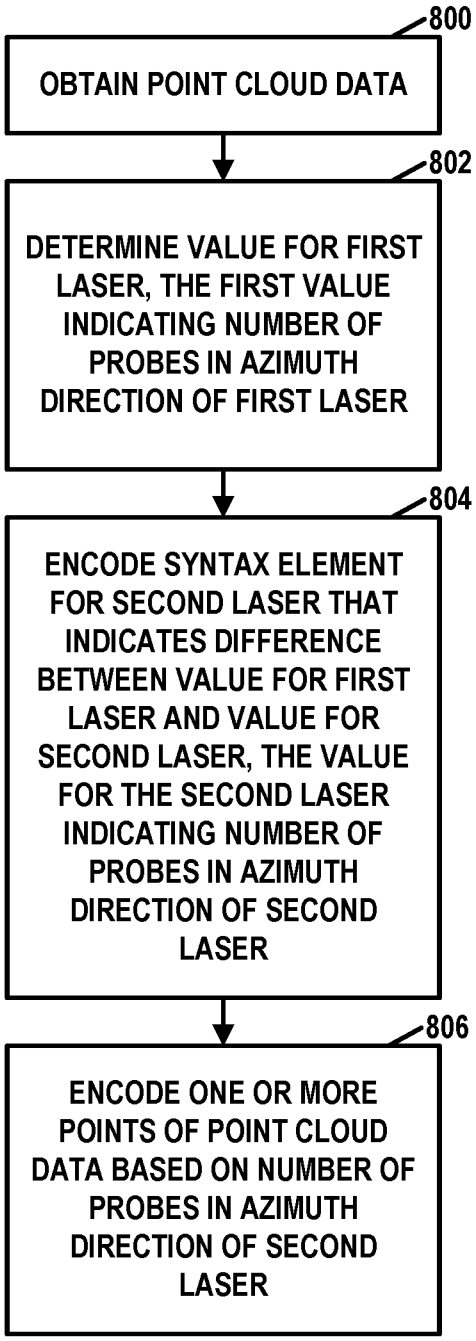

800
OBTAIN POINT CLOUD DATA
802
DETERMINE VALUE FOR FIRST LASER, THE FIRST VALUE INDICATING NUMBER OF PROBES IN AZIMUTH DIRECTION OF FIRST LASER
804
ENCODE SYNTAX ELEMENT FOR SECOND LASER THAT INDICATES DIFFERENCE BETWEEN VALUE FOR FIRST LASER AND VALUE FOR SECOND LASER, THE VALUE FOR THE SECOND LASER INDICATING NUMBER OF PROBES IN AZIMUTH DIRECTION OF SECOND LASER
806
ENCODE ONE OR MORE POINTS OF POINT CLOUD DATA BASED ON NUMBER OF PROBES IN AZIMUTH DIRECTION OF SECOND LASER

FIG. 8A

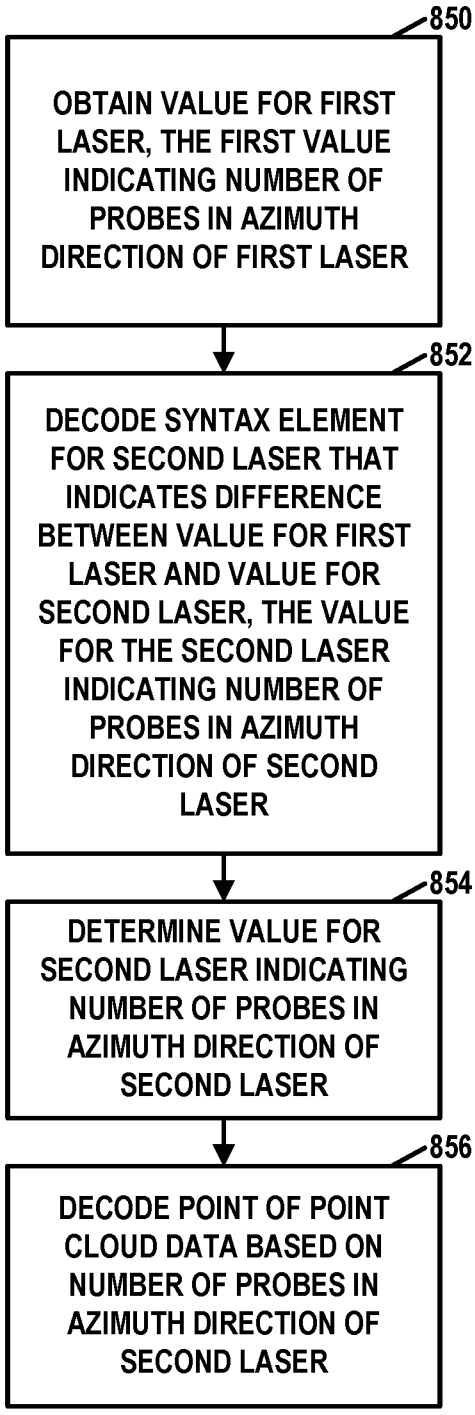

850
OBTAIN VALUE FOR FIRST LASER, THE FIRST VALUE INDICATING NUMBER OF PROBES IN AZIMUTH DIRECTION OF FIRST LASER
852
DECODE SYNTAX ELEMENT FOR SECOND LASER THAT INDICATES DIFFERENCE BETWEEN VALUE FOR FIRST LASER AND VALUE FOR SECOND LASER, THE VALUE FOR THE SECOND LASER INDICATING NUMBER OF PROBES IN AZIMUTH DIRECTION OF SECOND LASER
854
DETERMINE VALUE FOR SECOND LASER INDICATING NUMBER OF PROBES IN AZIMUTH DIRECTION OF SECOND LASER
856
DECODE POINT OF POINT CLOUD DATA BASED ON NUMBER OF PROBES IN AZIMUTH DIRECTION OF SECOND LASER

FIG. 8B

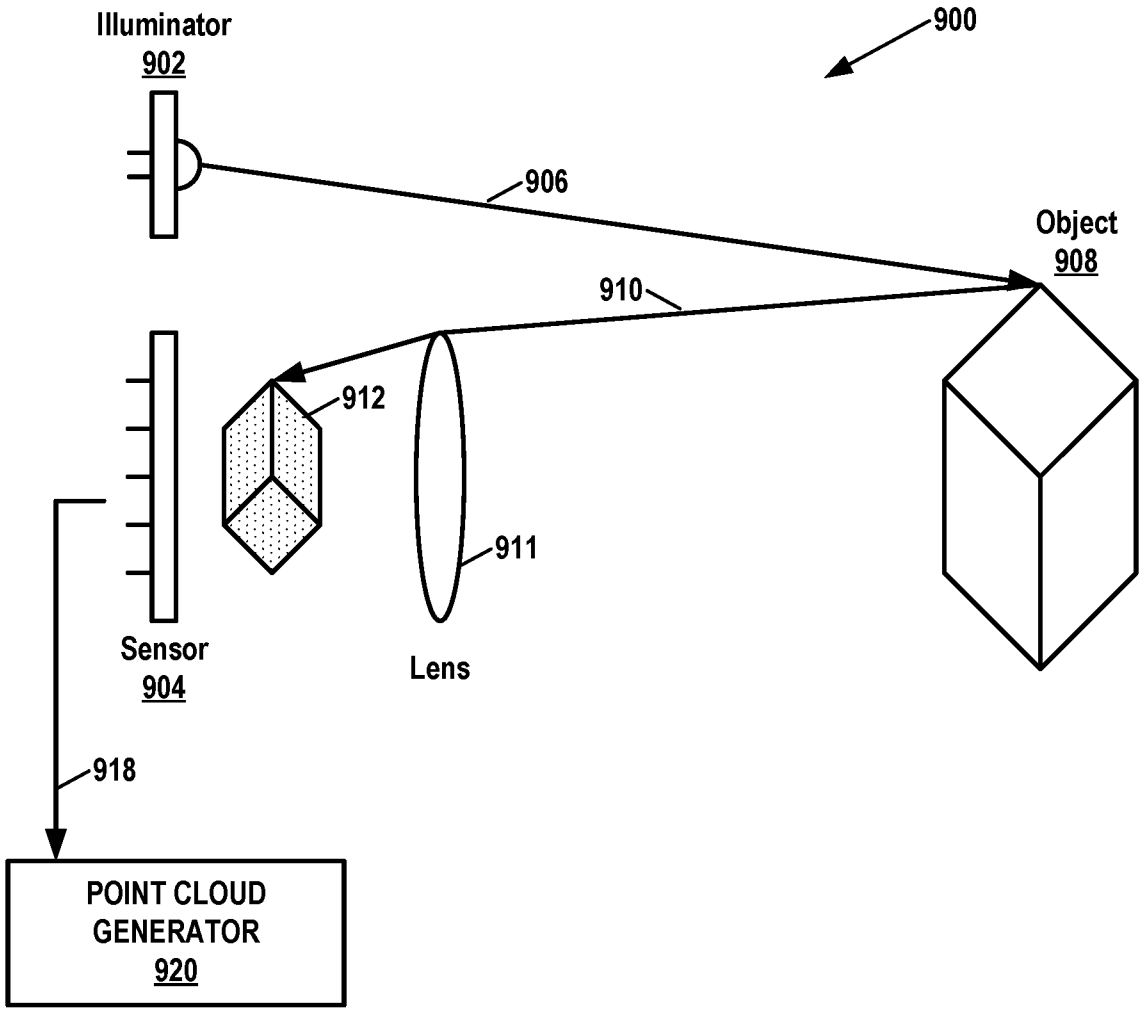

Illuminator
902
900
906
Object
908
910
912
911
Sensor
904
Lens
918
POINT CLOUD
GENERATOR
920

FIG. 9

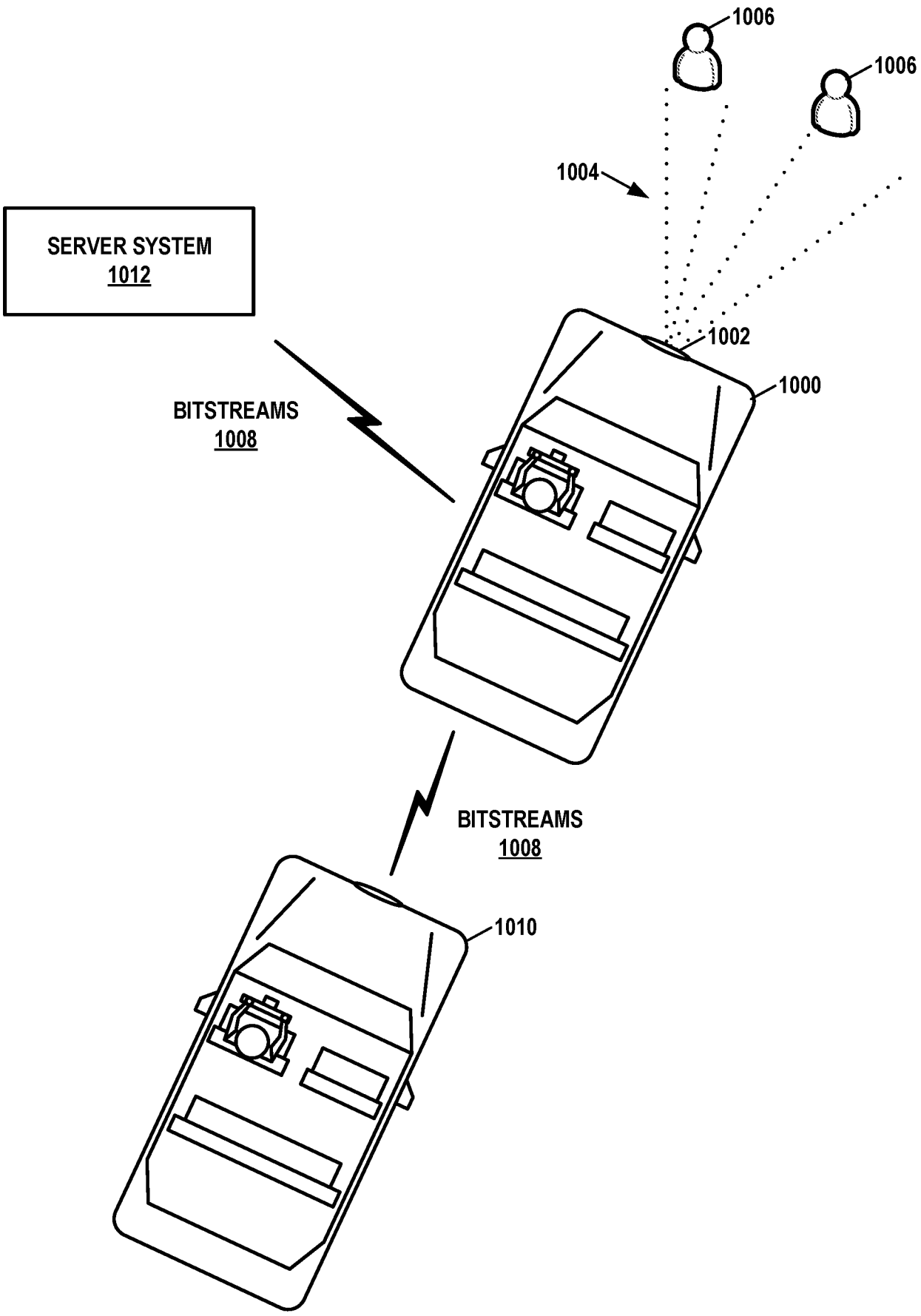

1006
1006
1004
SERVER SYSTEM
1012
1002
1000
BITSTREAMS
1008
BITSTREAMS
1008
1010

FIG. 10

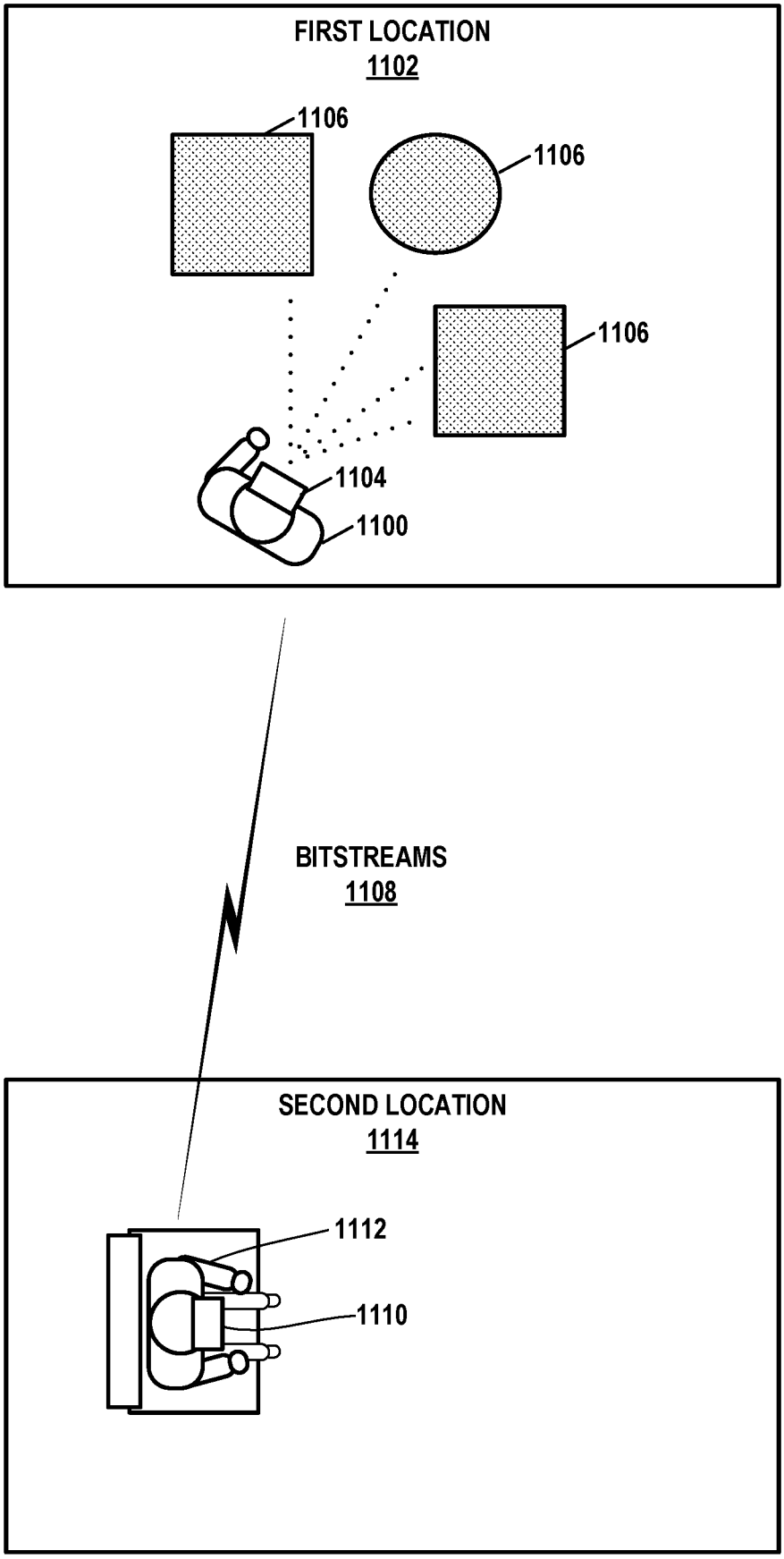

FIRST LOCATION
1102
1106
1106
1106
1104
1100
BITSTREAMS
1108
SECOND LOCATION
1114
1112
1110

FIG. 11

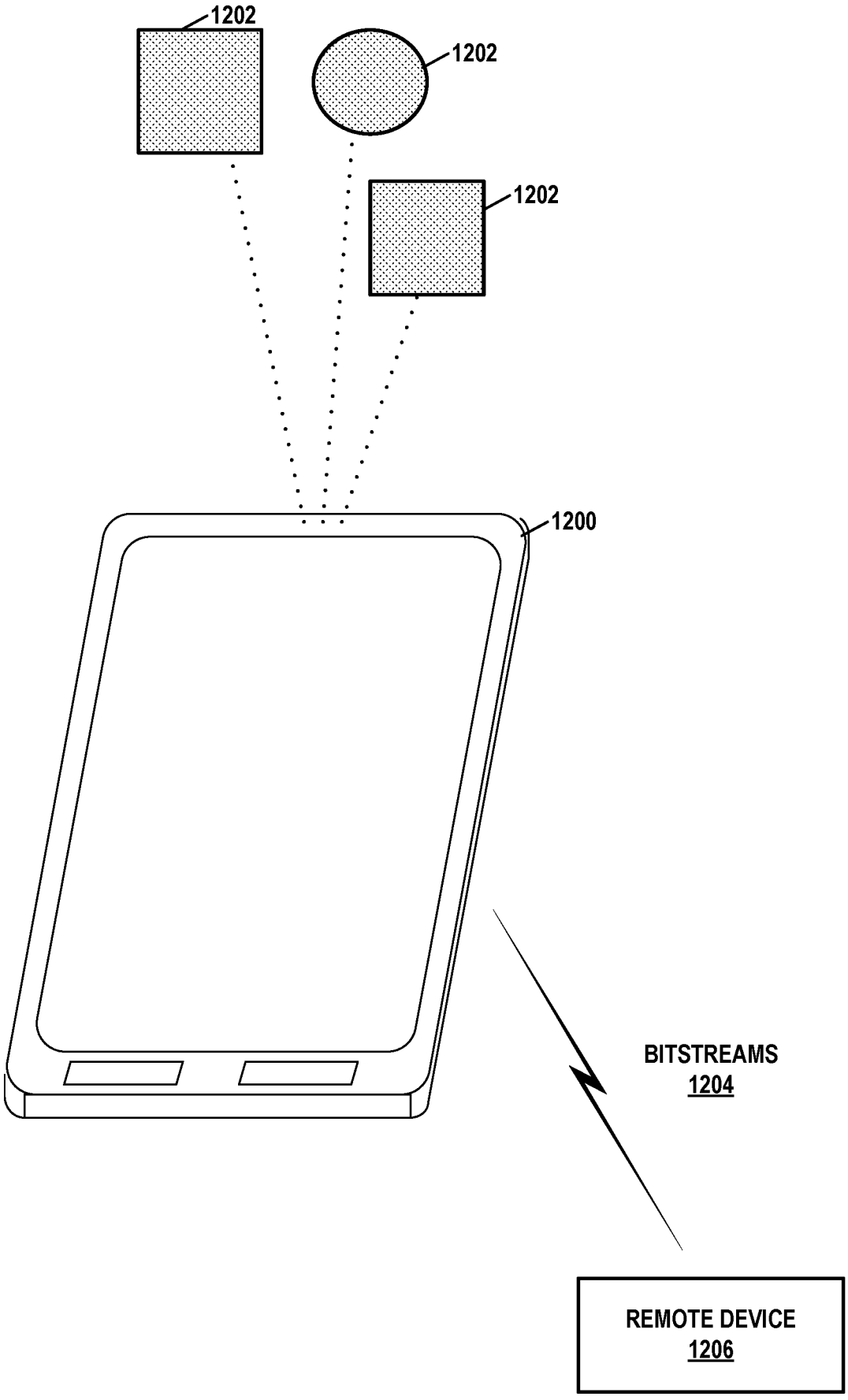


FIG. 12