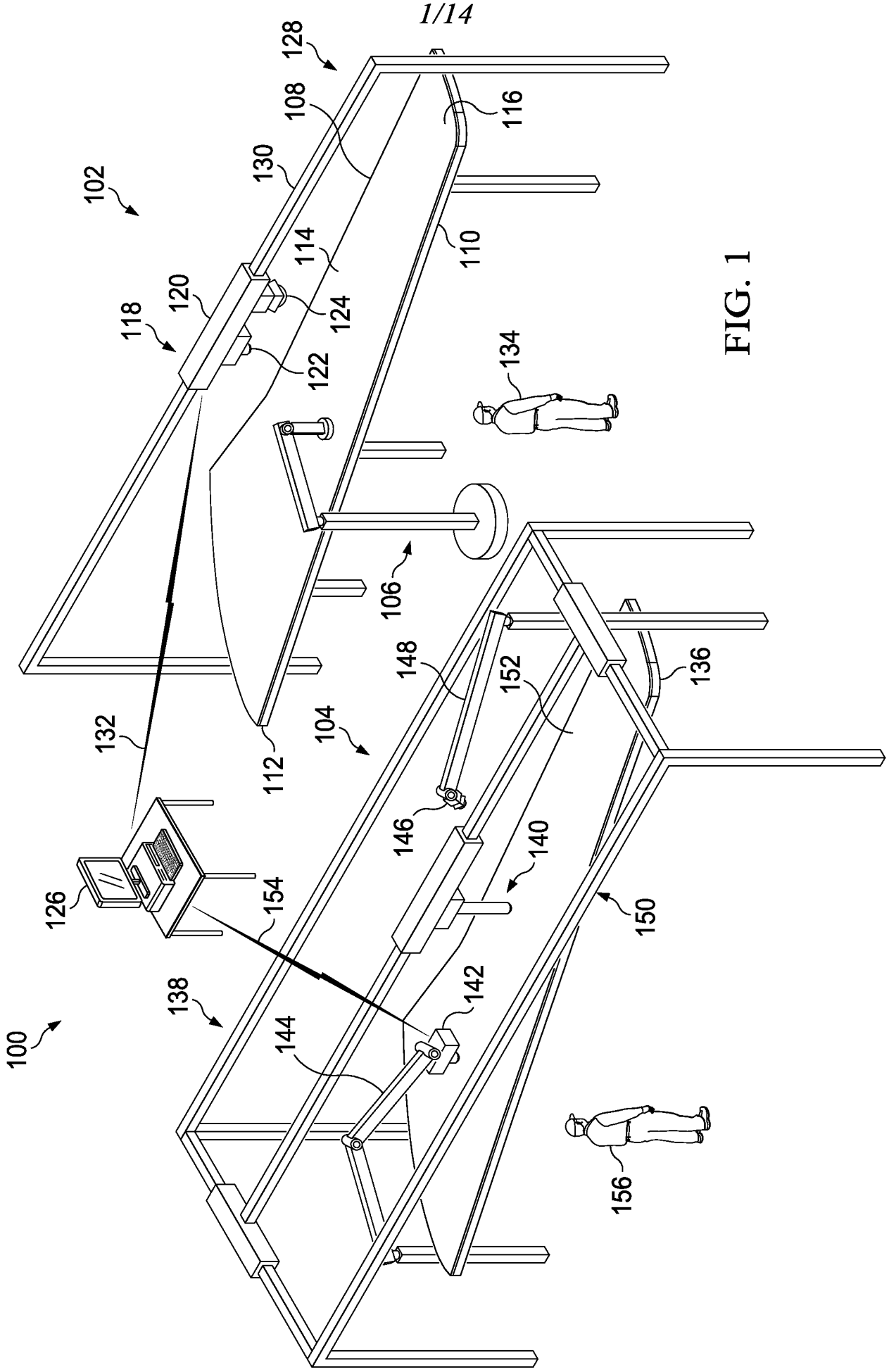

100
102
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FIG. 1

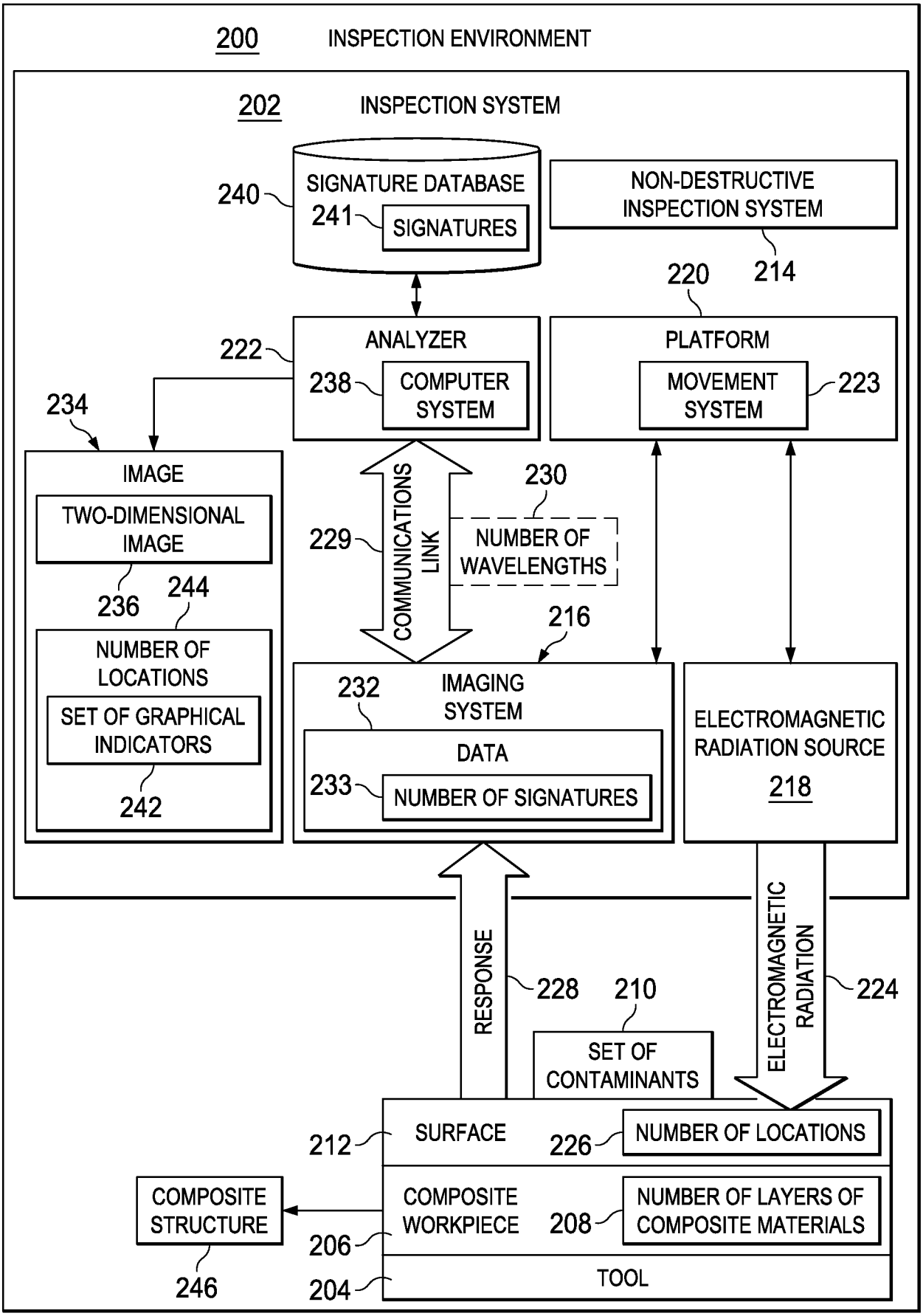

200 INSPECTION ENVIRONMENT
202 INSPECTION SYSTEM
240
SIGNATURE DATABASE
241
SIGNATURES
NON-DESTRUCTIVE INSPECTION SYSTEM
214
220
222
ANALYZER
238
COMPUTER SYSTEM
PLATFORM
MOVEMENT SYSTEM
223
234
IMAGE
TWO-DIMENSIONAL IMAGE
236
244
NUMBER OF LOCATIONS
SET OF GRAPHICAL INDICATORS
242
229
COMMUNICATIONS LINK
230
NUMBER OF WAVELENGTHS
216
232
IMAGING SYSTEM
DATA
233
NUMBER OF SIGNATURES
ELECTROMAGNETIC RADIATION SOURCE
218
RESPONSE
228
210
SET OF CONTAMINANTS
ELECTROMAGNETIC RADIATION
224
212
SURFACE
226
NUMBER OF LOCATIONS
COMPOSITE STRUCTURE
246
COMPOSITE WORKPIECE
206
208
NUMBER OF LAYERS OF COMPOSITE MATERIALS
204
TOOL

FIG. 2

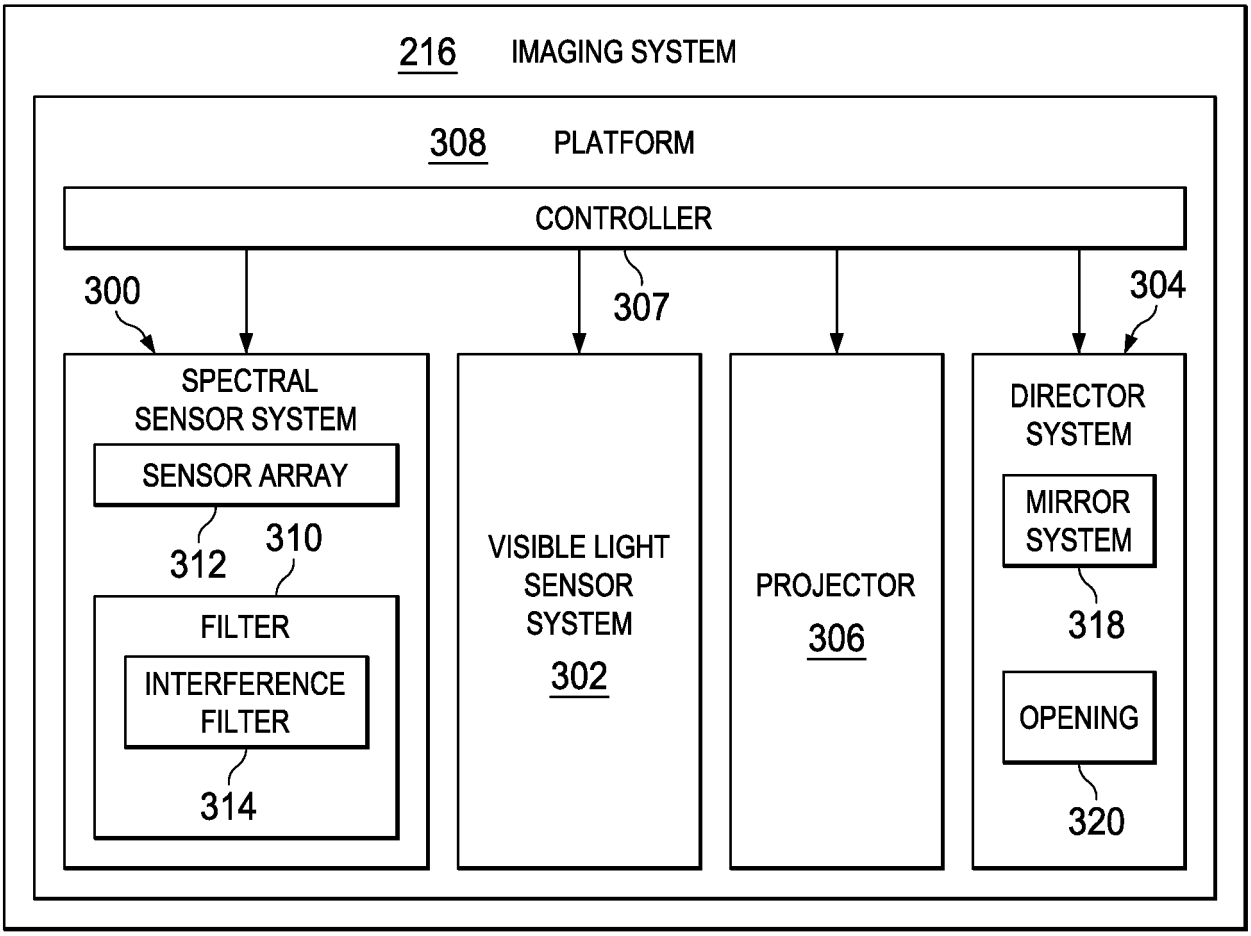

216 IMAGING SYSTEM
308 PLATFORM
CONTROLLER
300
307
304
SPECTRAL SENSOR SYSTEM
SENSOR ARRAY
312
310
FILTER
INTERFERENCE FILTER
314
VISIBLE LIGHT SENSOR SYSTEM
302
PROJECTOR
306
DIRECTOR SYSTEM
MIRROR SYSTEM
318
OPENING
320

FIG. 3

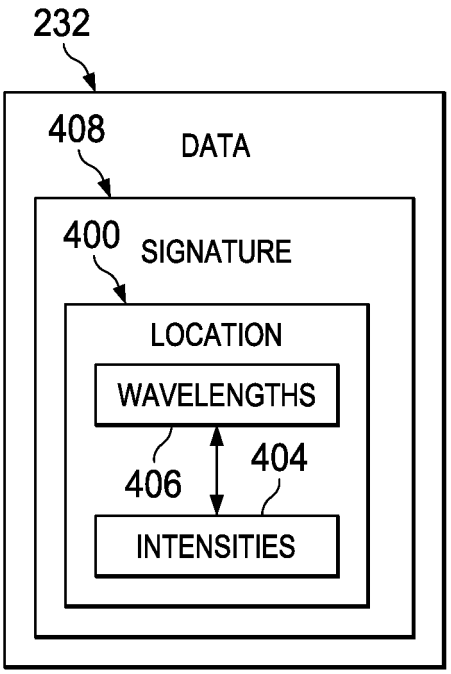

232
408
DATA
400
SIGNATURE
LOCATION
WAVELENGTHS
406
404
INTENSITIES

FIG. 4

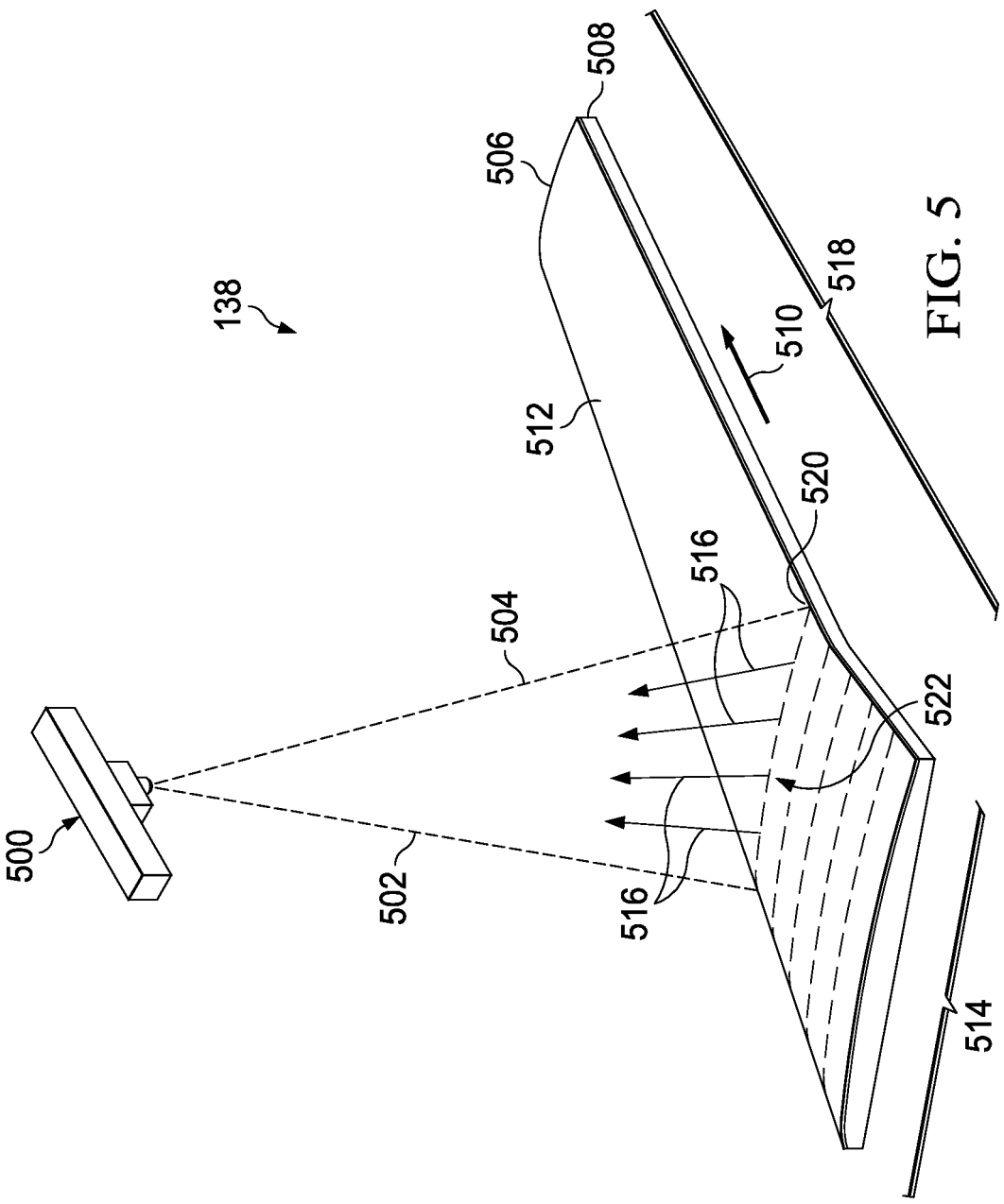


FIG. 5

FIG. 6

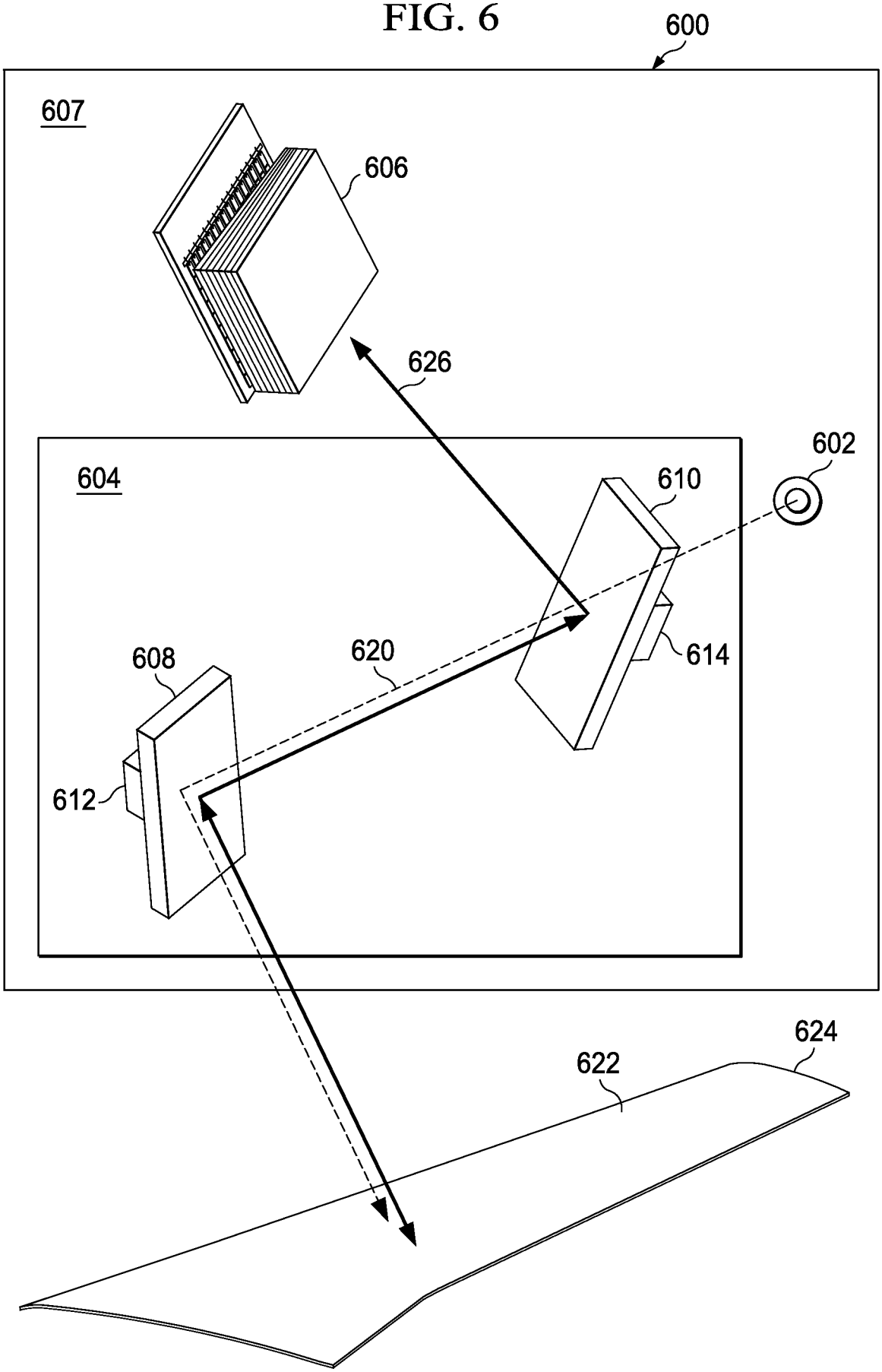


FIG. 7

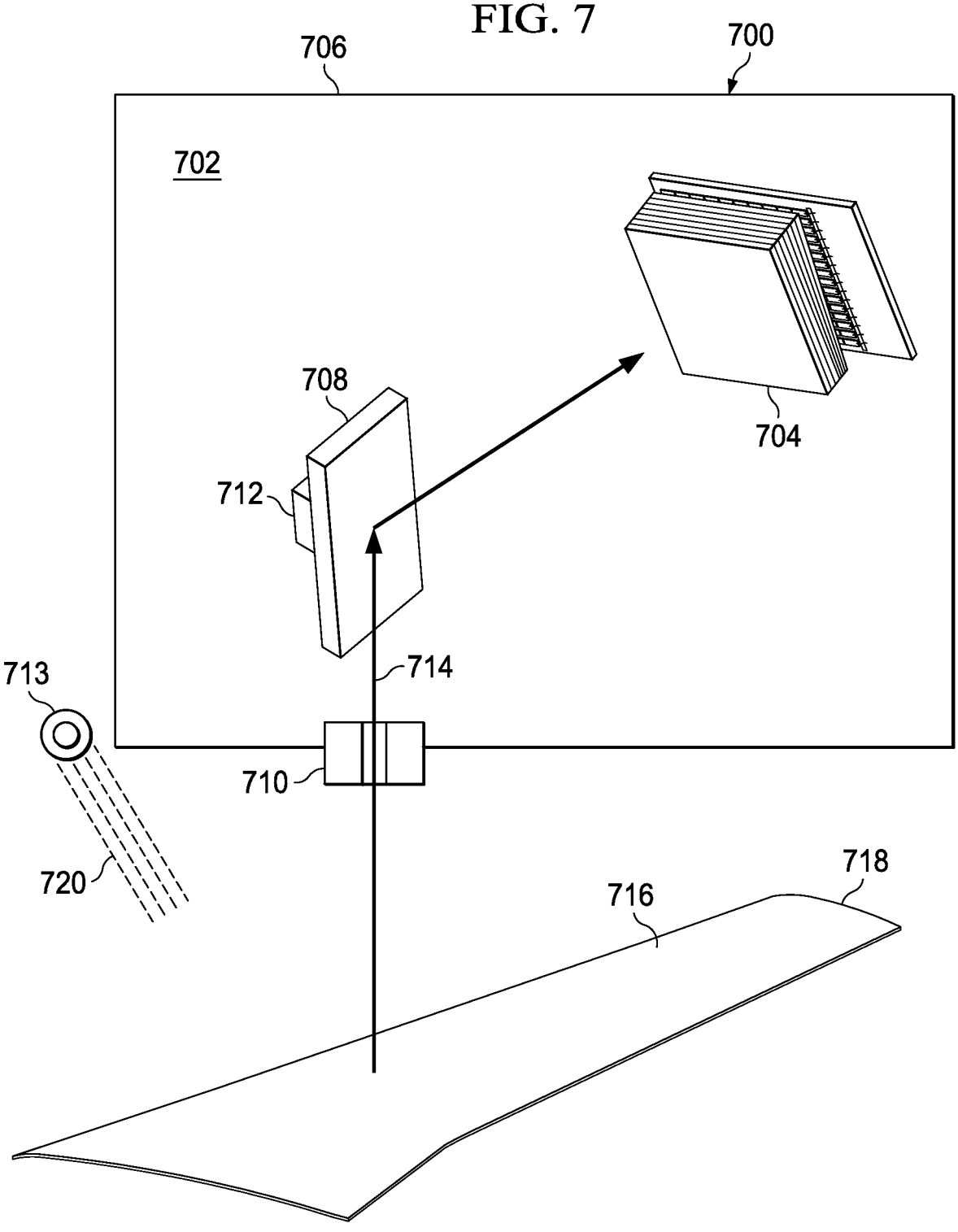
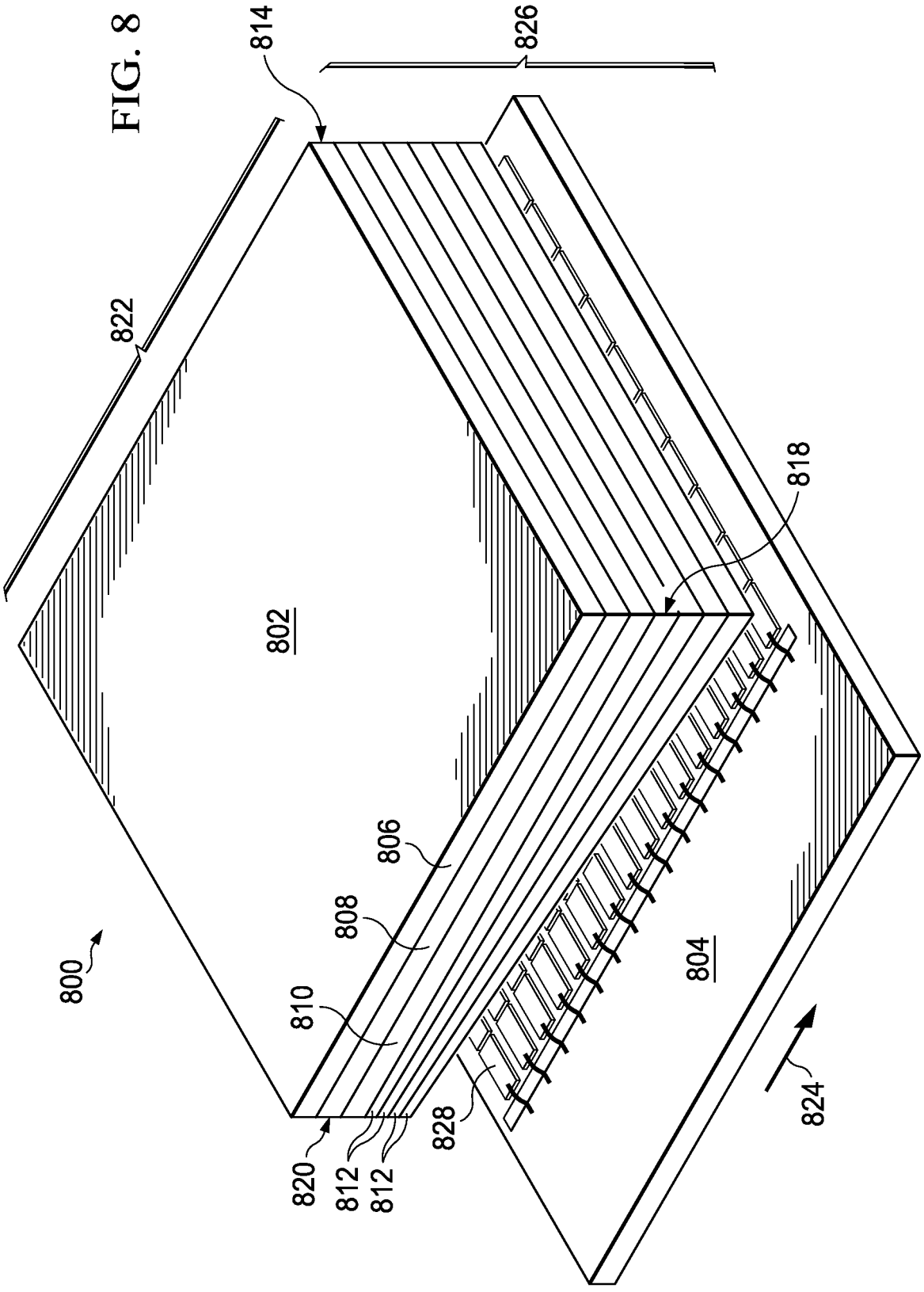


FIG. 8



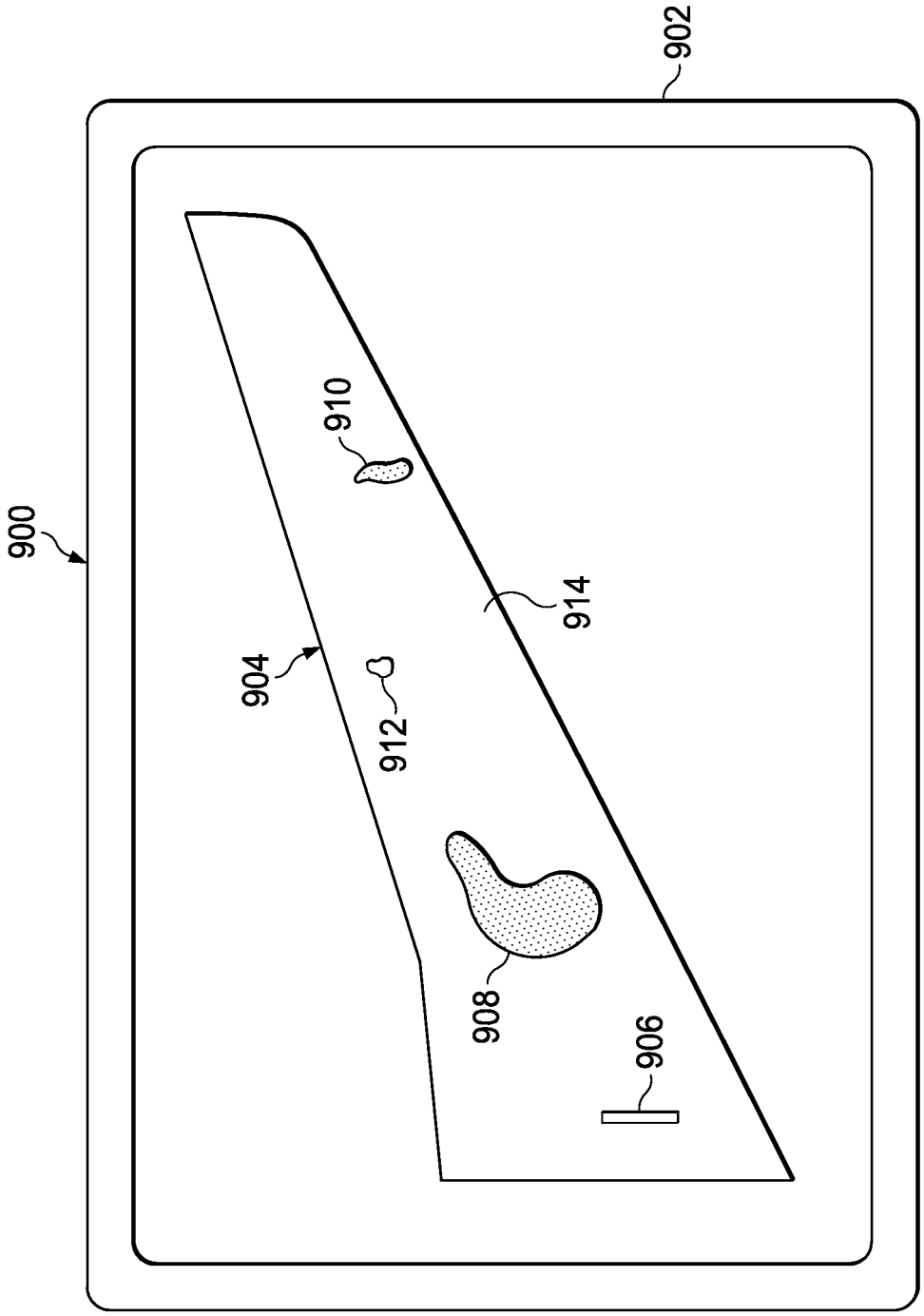


FIG. 9

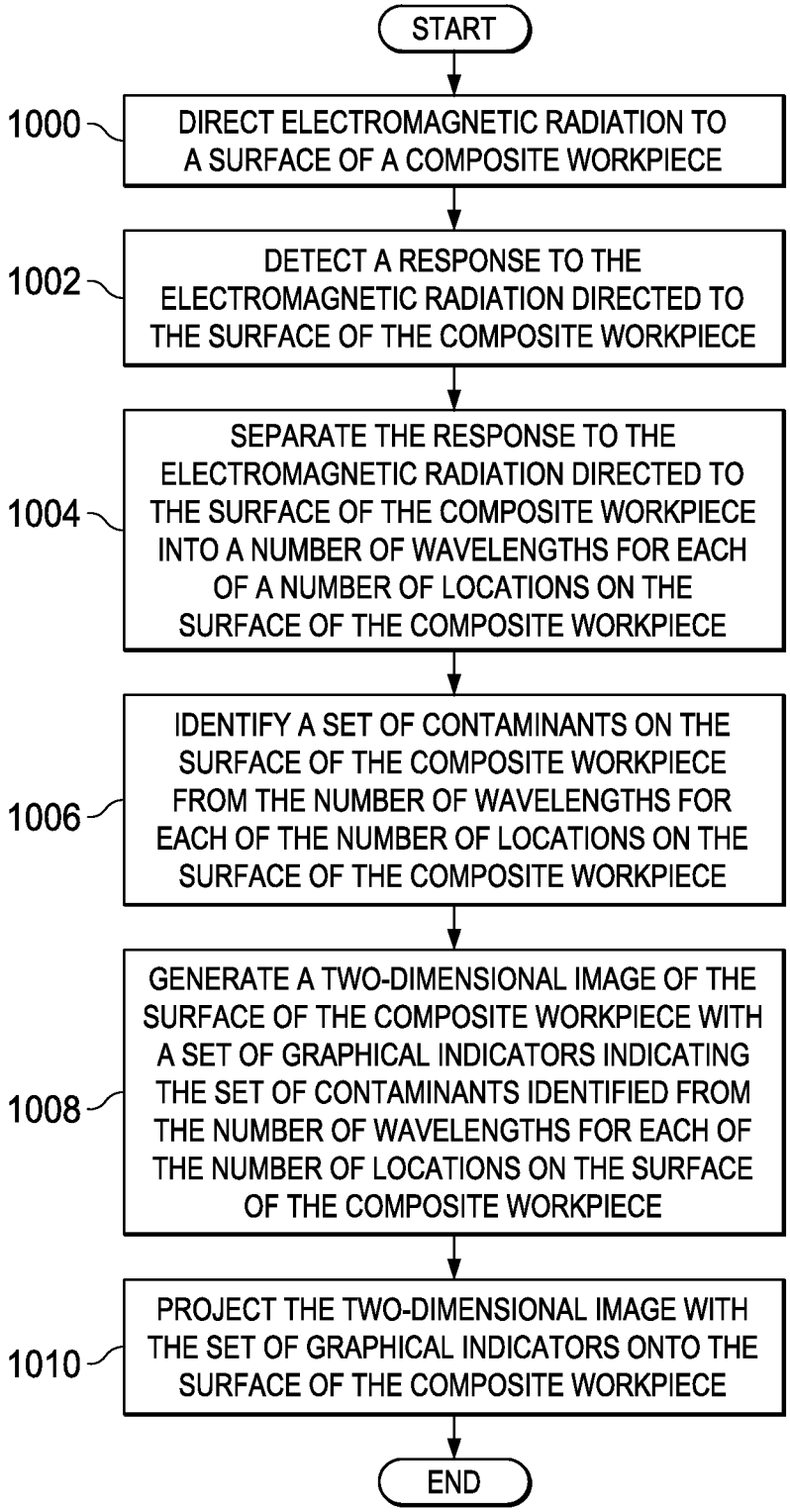

START
1000
DIRECT ELECTROMAGNETIC RADIATION TO A SURFACE OF A COMPOSITE WORKPIECE
1002
DETECT A RESPONSE TO THE ELECTROMAGNETIC RADIATION DIRECTED TO THE SURFACE OF THE COMPOSITE WORKPIECE
1004
SEPARATE THE RESPONSE TO THE ELECTROMAGNETIC RADIATION DIRECTED TO THE SURFACE OF THE COMPOSITE WORKPIECE INTO A NUMBER OF WAVELENGTHS FOR EACH OF A NUMBER OF LOCATIONS ON THE SURFACE OF THE COMPOSITE WORKPIECE
1006
IDENTIFY A SET OF CONTAMINANTS ON THE SURFACE OF THE COMPOSITE WORKPIECE FROM THE NUMBER OF WAVELENGTHS FOR EACH OF THE NUMBER OF LOCATIONS ON THE SURFACE OF THE COMPOSITE WORKPIECE
1008
GENERATE A TWO-DIMENSIONAL IMAGE OF THE SURFACE OF THE COMPOSITE WORKPIECE WITH A SET OF GRAPHICAL INDICATORS INDICATING THE SET OF CONTAMINANTS IDENTIFIED FROM THE NUMBER OF WAVELENGTHS FOR EACH OF THE NUMBER OF LOCATIONS ON THE SURFACE OF THE COMPOSITE WORKPIECE
1010
PROJECT THE TWO-DIMENSIONAL IMAGE WITH THE SET OF GRAPHICAL INDICATORS ONTO THE SURFACE OF THE COMPOSITE WORKPIECE
END

FIG. 10

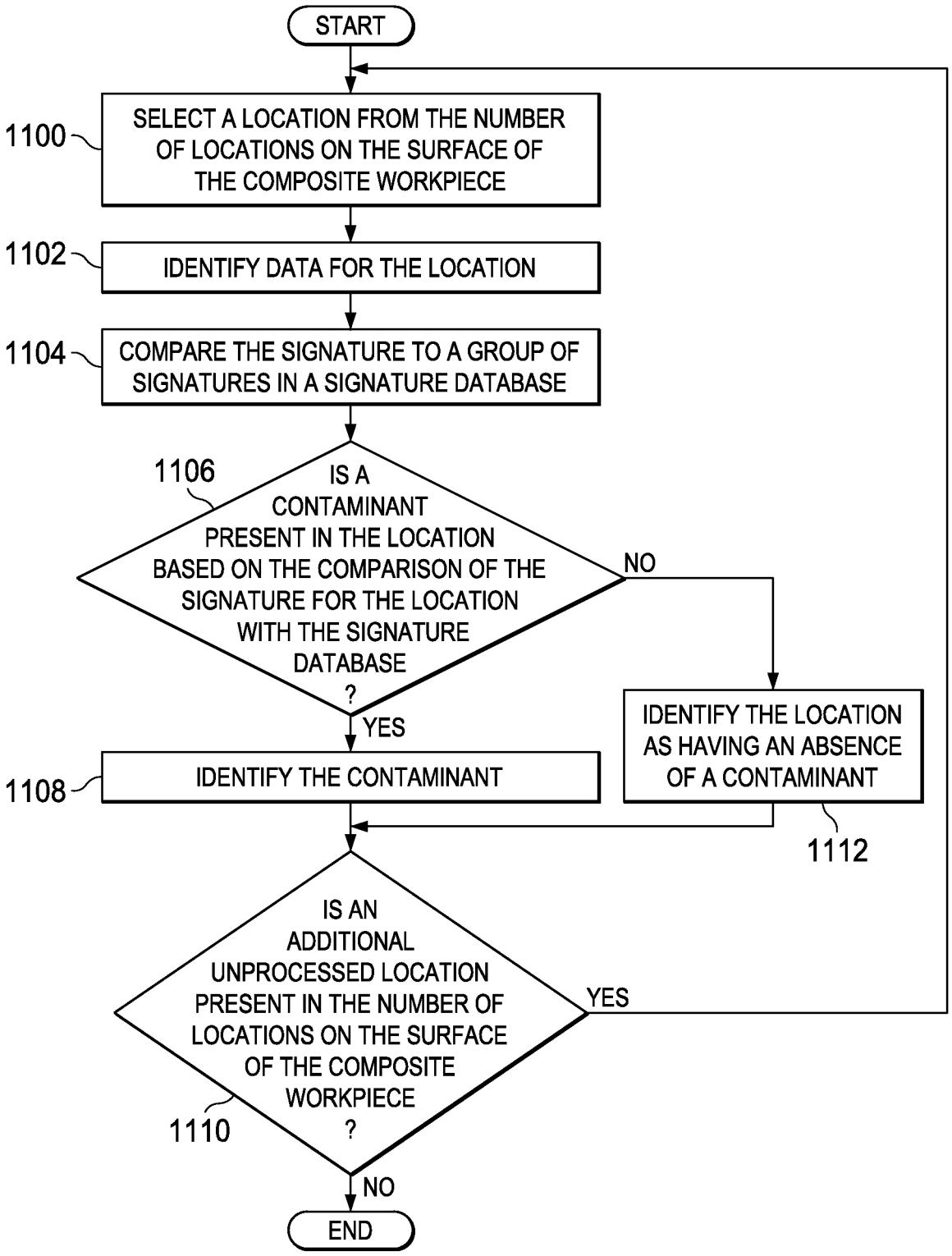

START
SELECT A LOCATION FROM THE NUMBER OF LOCATIONS ON THE SURFACE OF THE COMPOSITE WORKPIECE
1100
IDENTIFY DATA FOR THE LOCATION
1102
COMPARE THE SIGNATURE TO A GROUP OF SIGNATURES IN A SIGNATURE DATABASE
1104
1106
IS A CONTAMINANT PRESENT IN THE LOCATION BASED ON THE COMPARISON OF THE SIGNATURE FOR THE LOCATION WITH THE SIGNATURE DATABASE ?
NO
YES
IDENTIFY THE CONTAMINANT
1108
IDENTIFY THE LOCATION AS HAVING AN ABSENCE OF A CONTAMINANT
1112
IS AN ADDITIONAL UNPROCESSED LOCATION PRESENT IN THE NUMBER OF LOCATIONS ON THE SURFACE OF THE COMPOSITE WORKPIECE ?
1110
YES
NO
END

FIG. 11

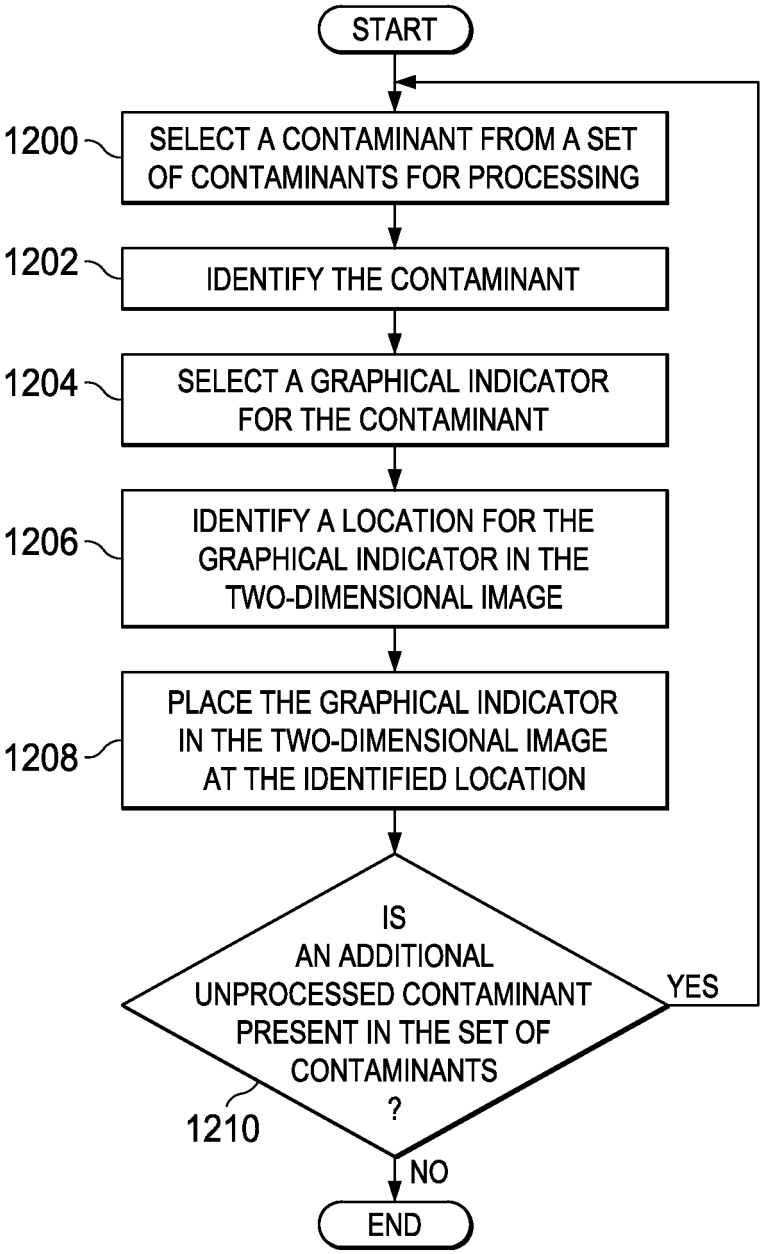

START
1200
SELECT A CONTAMINANT FROM A SET OF CONTAMINANTS FOR PROCESSING
1202
IDENTIFY THE CONTAMINANT
1204
SELECT A GRAPHICAL INDICATOR FOR THE CONTAMINANT
1206
IDENTIFY A LOCATION FOR THE GRAPHICAL INDICATOR IN THE TWO-DIMENSIONAL IMAGE
1208
PLACE THE GRAPHICAL INDICATOR IN THE TWO-DIMENSIONAL IMAGE AT THE IDENTIFIED LOCATION
IS AN ADDITIONAL UNPROCESSED CONTAMINANT PRESENT IN THE SET OF CONTAMINANTS ?
1210
YES
NO
END

FIG. 12

FIG. 13

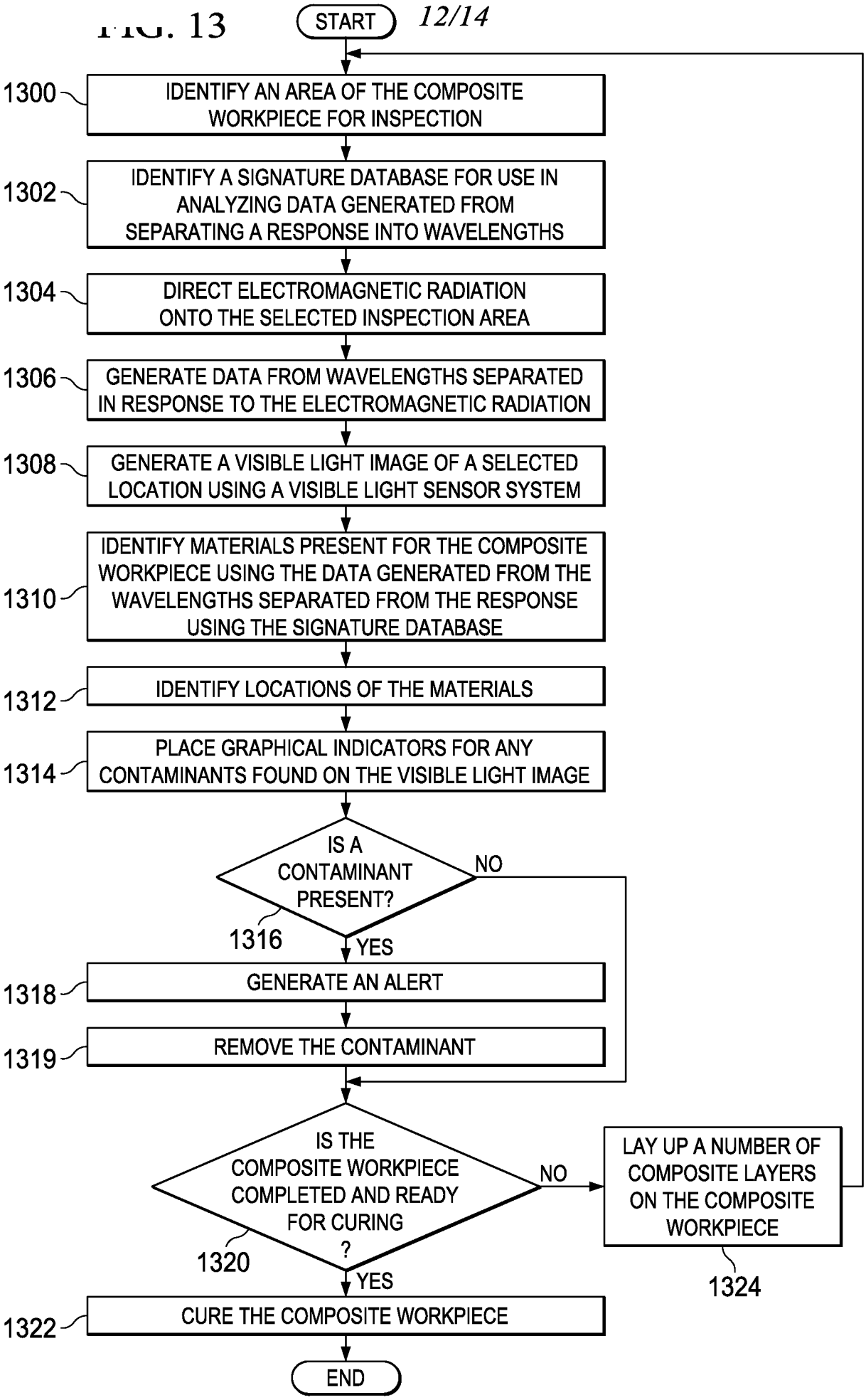
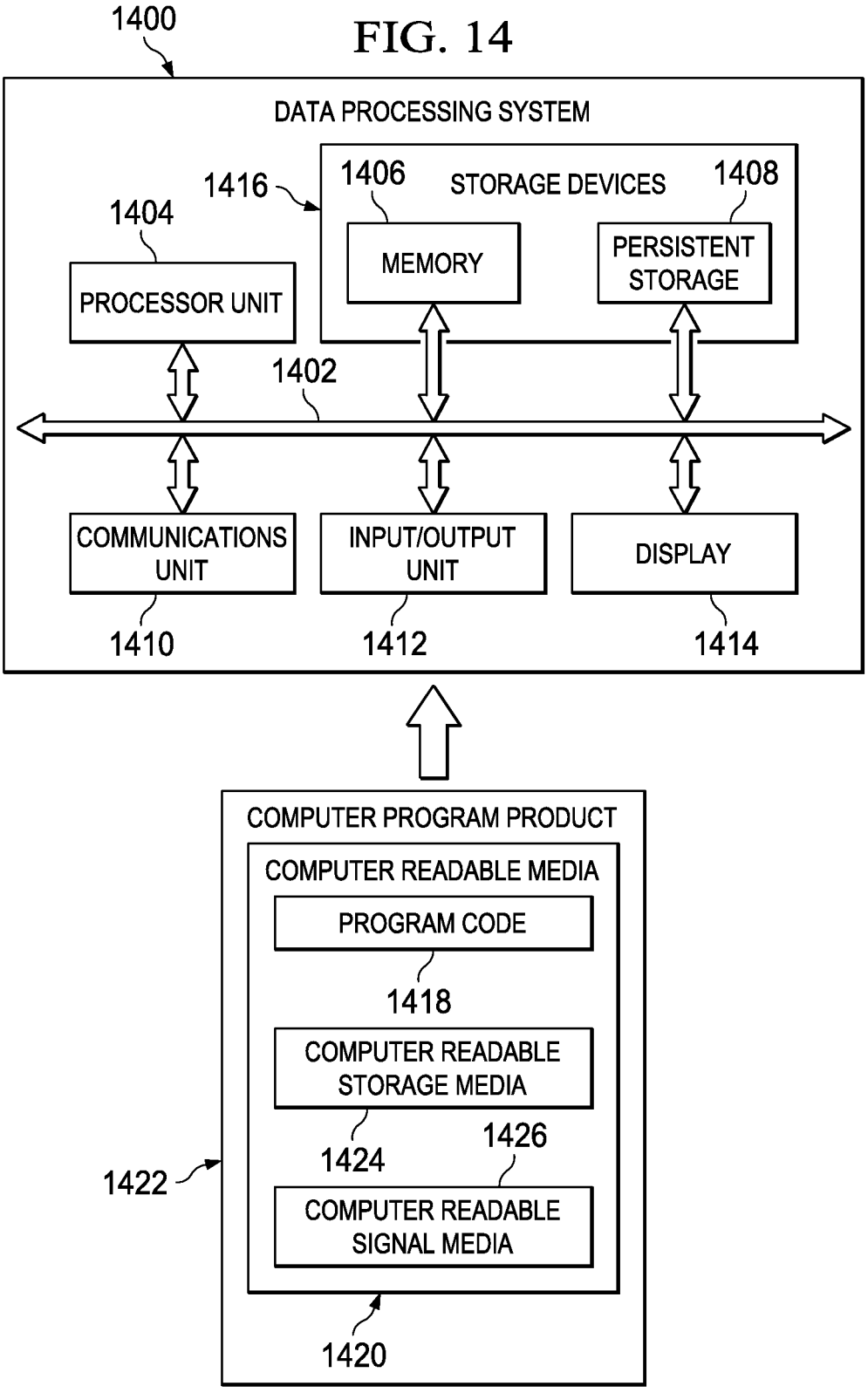

START
1300
IDENTIFY AN AREA OF THE COMPOSITE WORKPIECE FOR INSPECTION
1302
IDENTIFY A SIGNATURE DATABASE FOR USE IN ANALYZING DATA GENERATED FROM SEPARATING A RESPONSE INTO WAVELENGTHS
1304
DIRECT ELECTROMAGNETIC RADIATION ONTO THE SELECTED INSPECTION AREA
1306
GENERATE DATA FROM WAVELENGTHS SEPARATED IN RESPONSE TO THE ELECTROMAGNETIC RADIATION
1308
GENERATE A VISIBLE LIGHT IMAGE OF A SELECTED LOCATION USING A VISIBLE LIGHT SENSOR SYSTEM
1310
IDENTIFY MATERIALS PRESENT FOR THE COMPOSITE WORKPIECE USING THE DATA GENERATED FROM THE WAVELENGTHS SEPARATED FROM THE RESPONSE USING THE SIGNATURE DATABASE
1312
IDENTIFY LOCATIONS OF THE MATERIALS
1314
PLACE GRAPHICAL INDICATORS FOR ANY CONTAMINANTS FOUND ON THE VISIBLE LIGHT IMAGE
IS A CONTAMINANT PRESENT?
1316
NO
YES
1318
GENERATE AN ALERT
1319
REMOVE THE CONTAMINANT
IS THE COMPOSITE WORKPIECE COMPLETED AND READY FOR CURING ?
1320
NO
LAY UP A NUMBER OF COMPOSITE LAYERS ON THE COMPOSITE WORKPIECE
1324
YES
1322
CURE THE COMPOSITE WORKPIECE
END

FIG. 14


1400
DATA PROCESSING SYSTEM
1416
1406
STORAGE DEVICES
1408
1404
MEMORY
PERSISTENT STORAGE
PROCESSOR UNIT
1402
COMMUNICATIONS UNIT
INPUT/OUTPUT UNIT
DISPLAY
1410
1412
1414
COMPUTER PROGRAM PRODUCT
COMPUTER READABLE MEDIA
PROGRAM CODE
1418
COMPUTER READABLE STORAGE MEDIA
1424
1426
1422
COMPUTER READABLE SIGNAL MEDIA
1420

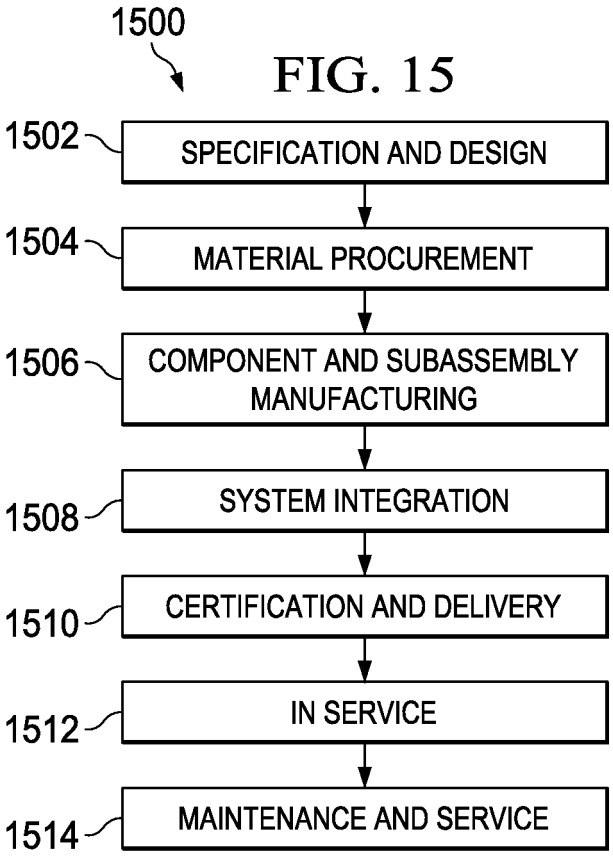

1500
1502
SPECIFICATION AND DESIGN
1504
MATERIAL PROCUREMENT
1506
COMPONENT AND SUBASSEMBLY MANUFACTURING
1508
SYSTEM INTEGRATION
1510
CERTIFICATION AND DELIVERY
1512
IN SERVICE
1514
MAINTENANCE AND SERVICE

FIG. 15

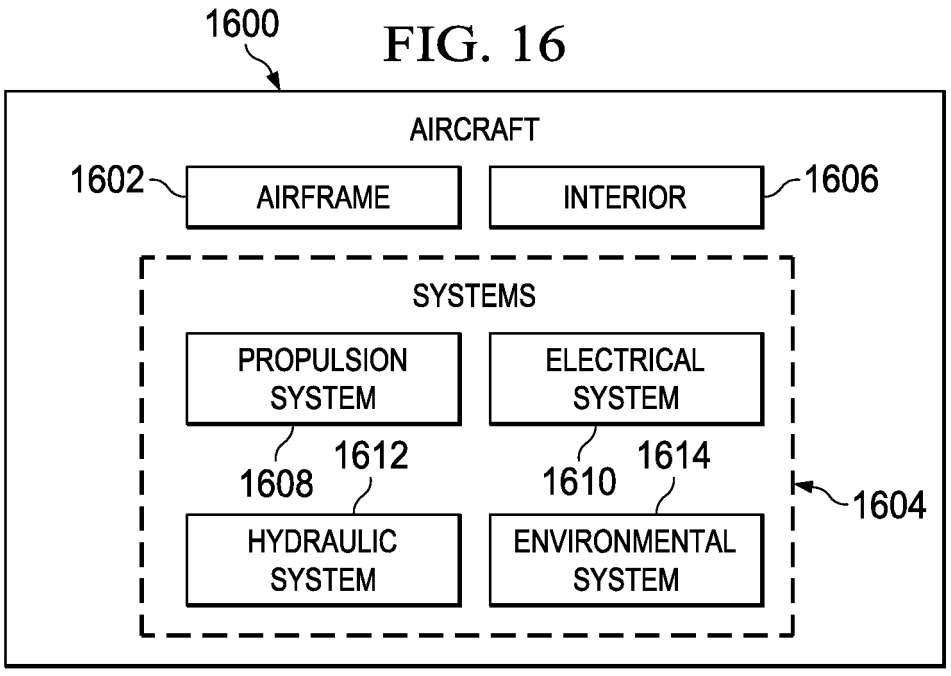

1600
AIRCRAFT
1602
AIRFRAME
INTERIOR
1606
SYSTEMS
PROPULSION SYSTEM
ELECTRICAL SYSTEM
1608
1612
1610
1614
HYDRAULIC SYSTEM
ENVIRONMENTAL SYSTEM
1604

FIG. 16