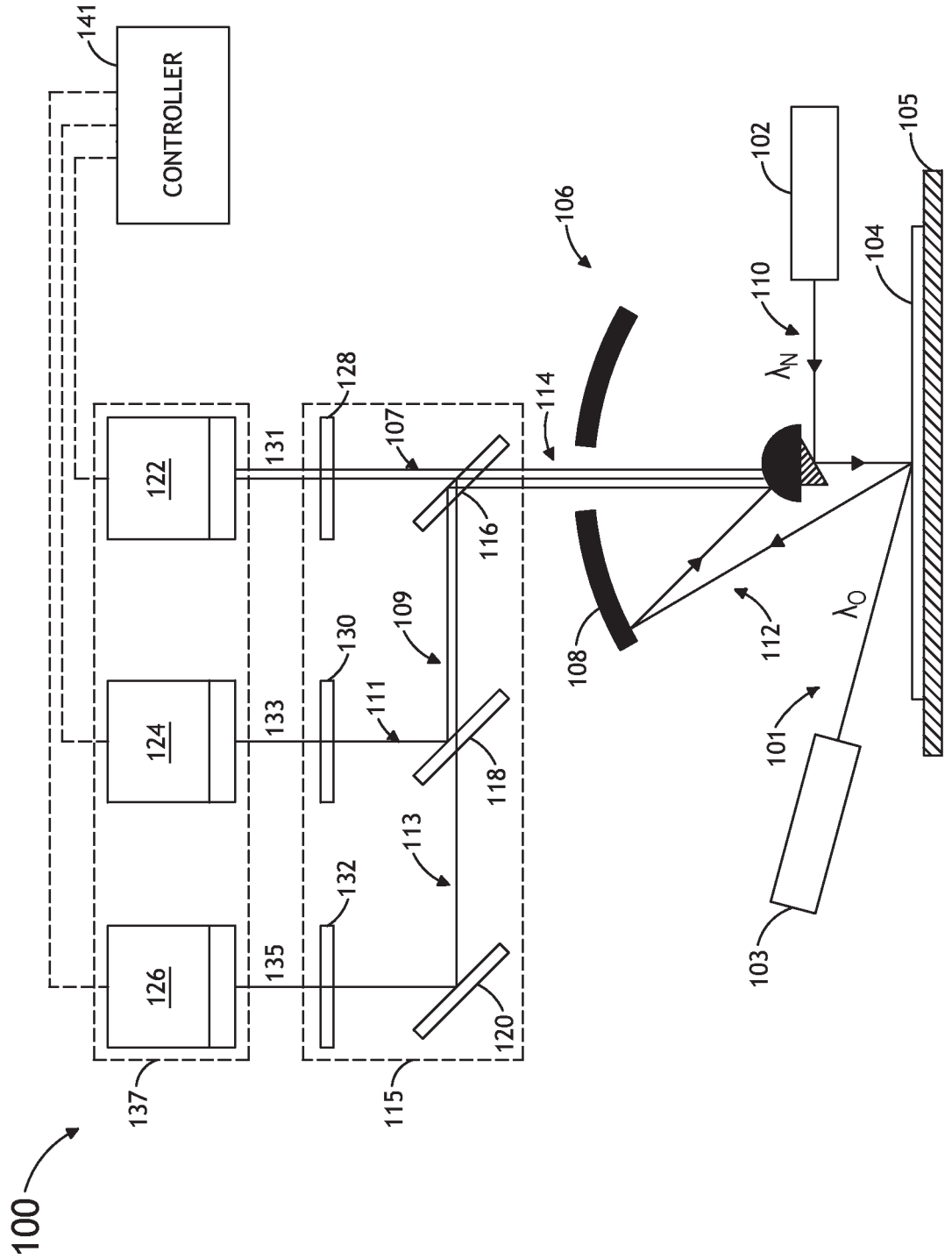

100
CONTROLLER
141
122
124
126
131
133
135
128
130
132
107
109
111
113
116
118
120
137
115
106
114
108
102
110
λ_N
104
105
112
λ_O
101
103

FIG. 1A

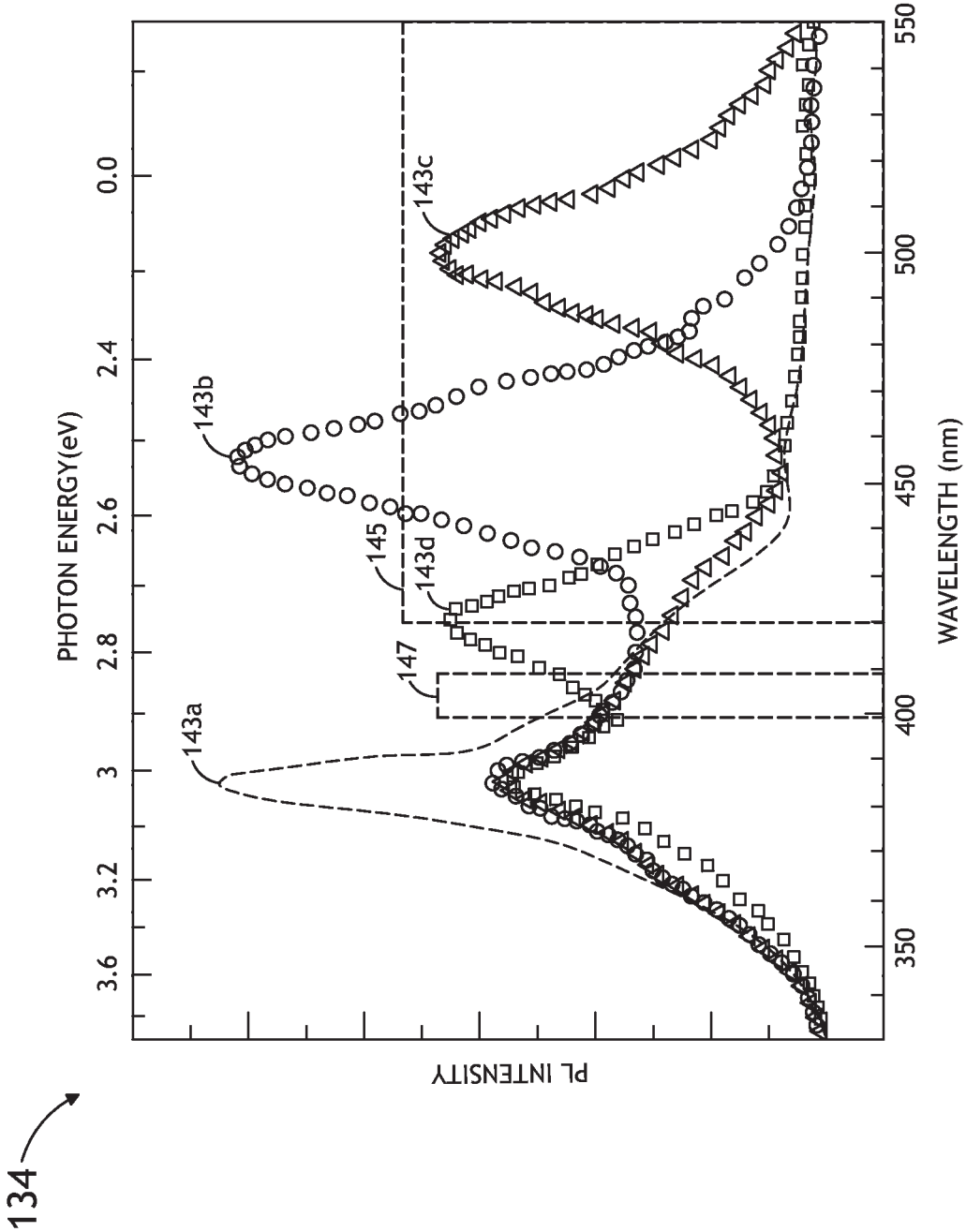

134
PL INTENSITY
PHOTON ENERGY(eV)
0.0
2.4
2.6
2.8
3
3.2
3.6
WAVELENGTH (nm)
350
400
450
500
550
143a
143b
143c
143d
145
147

FIG.1B

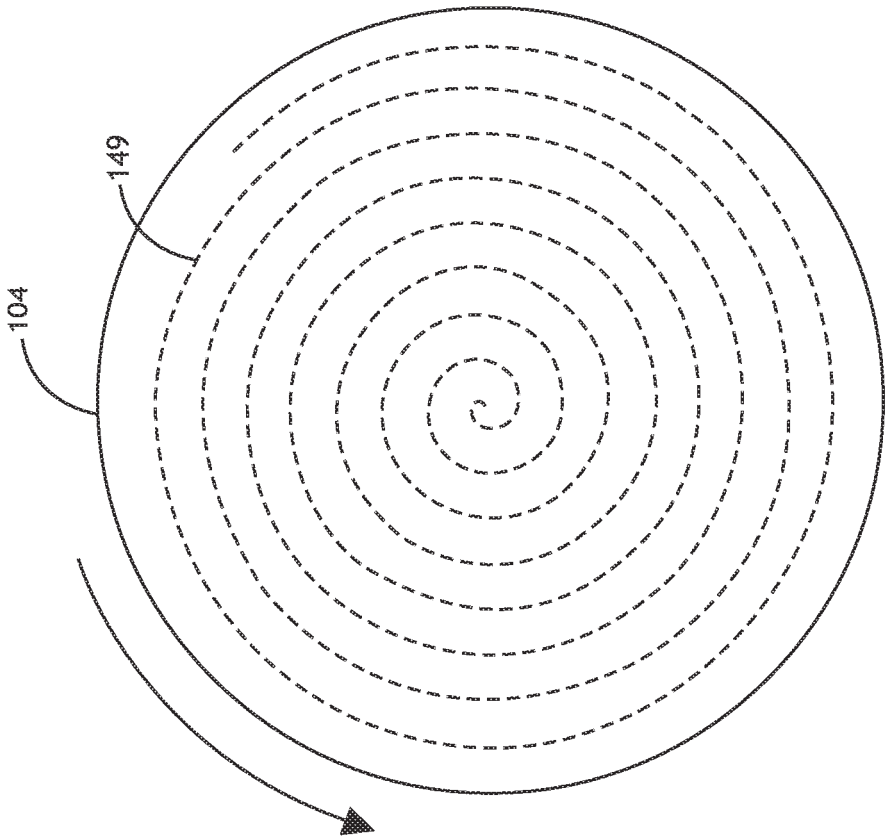


FIG.1C

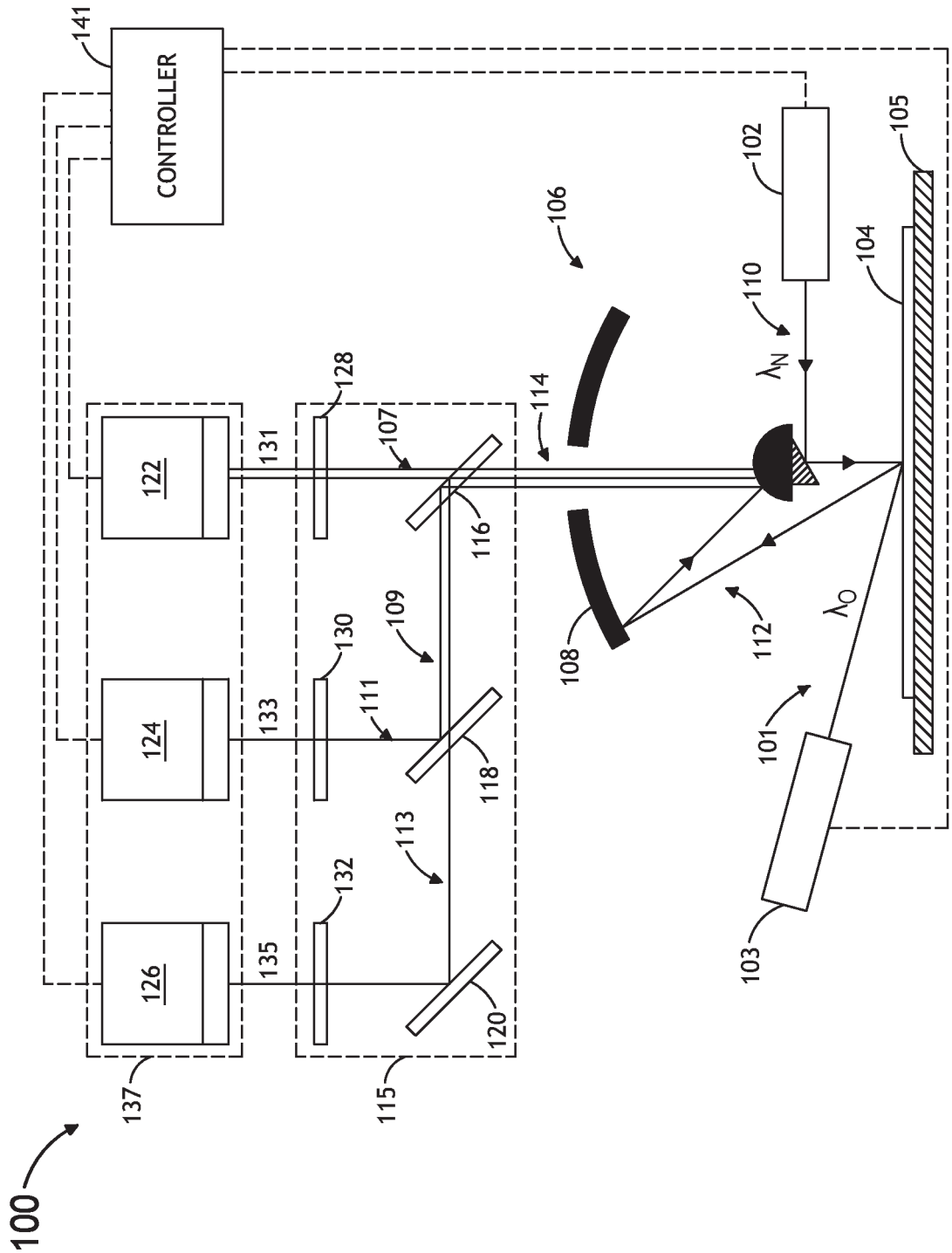

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CONTROLLER
141
122
124
126
131
133
135
128
130
132
107
109
111
113
116
118
120
106
114
108
102
110
λ_N
104
105
112
λ_O
101
103
137
115

FIG. 1D

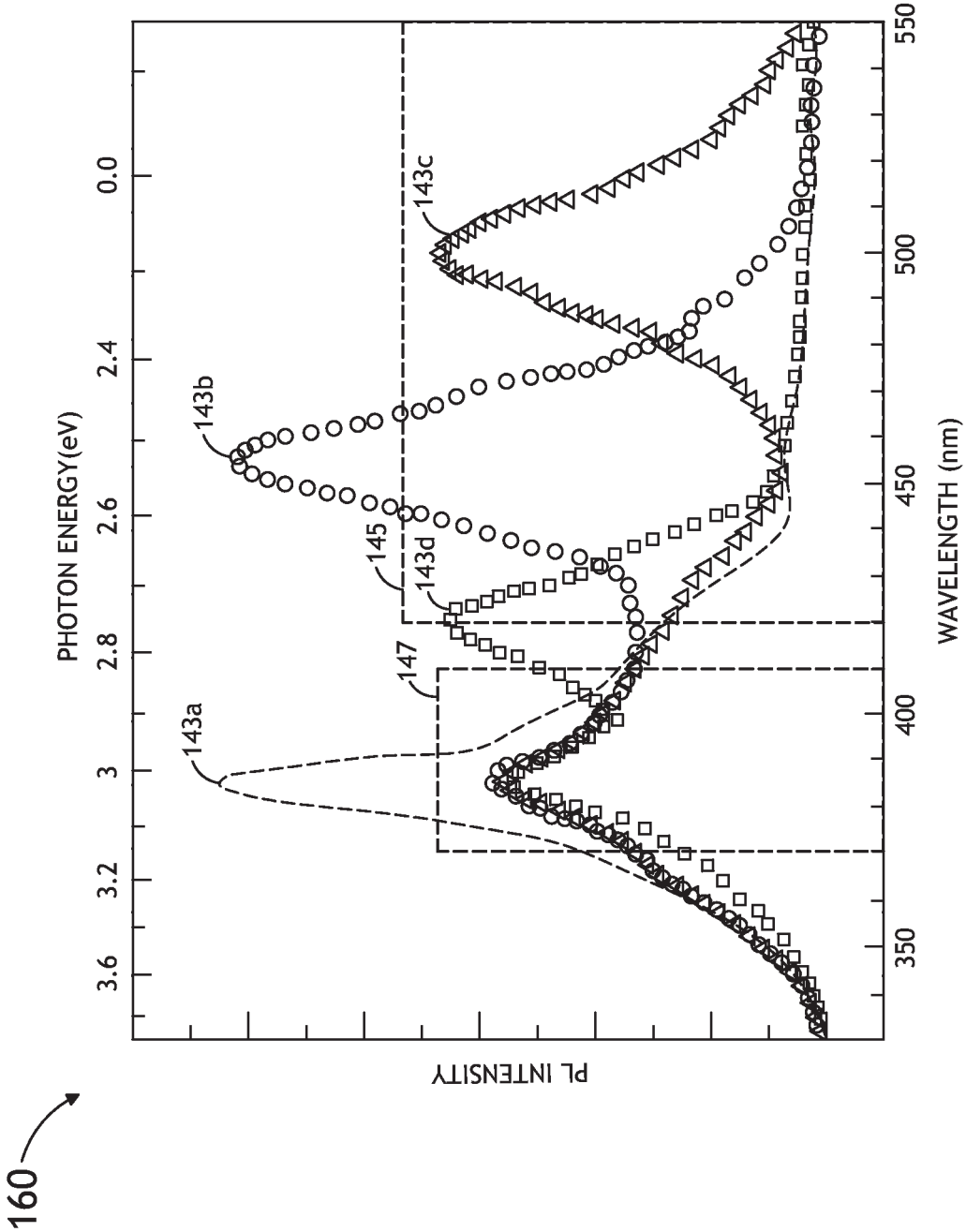

160
PL INTENSITY
PHOTON ENERGY(eV)
3.6
3.2
3
2.8
2.6
2.4
0.0
WAVELENGTH (nm)
350
400
450
500
550
143a
143b
143c
143d
145
147

FIG.1E

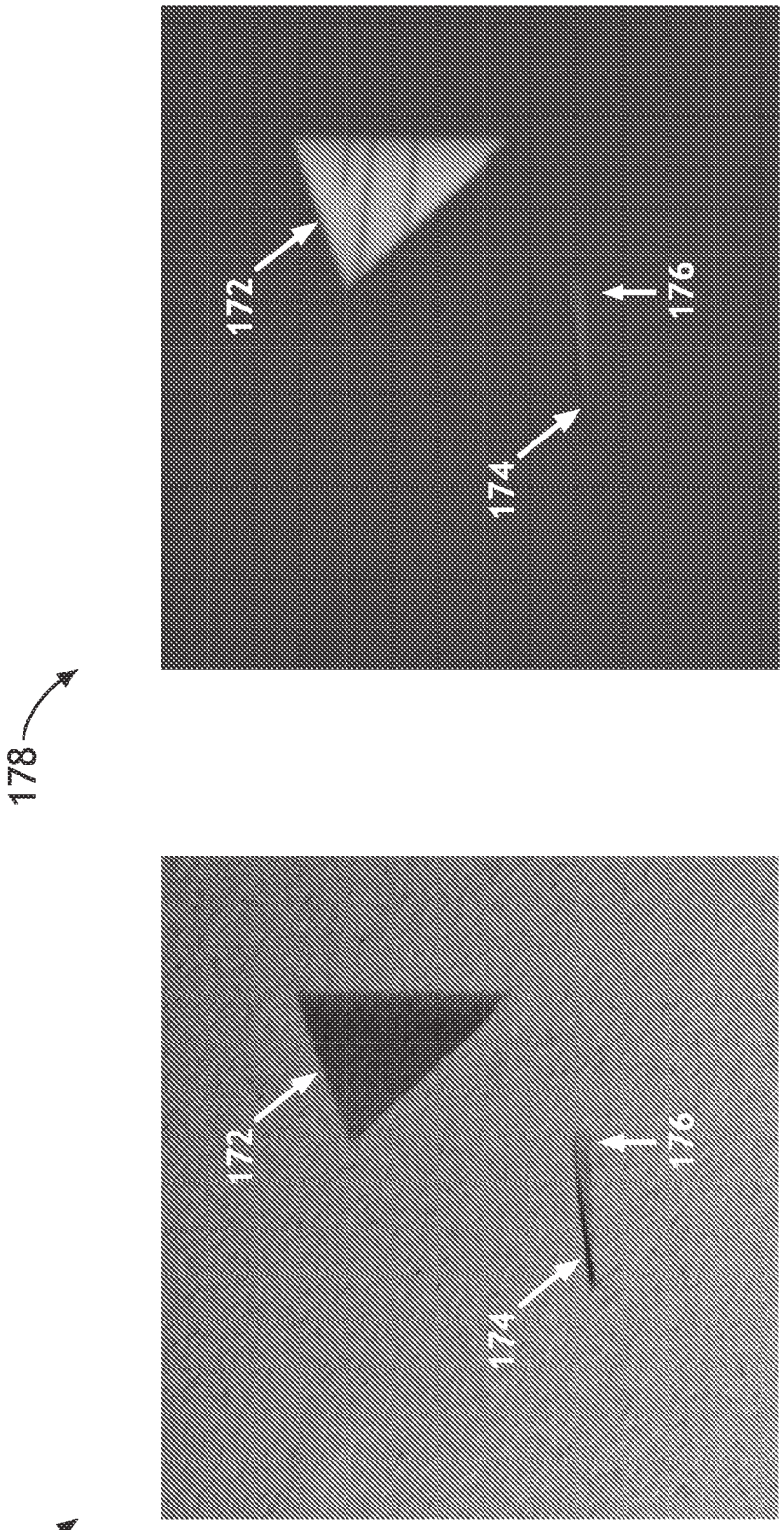


FIG.1F

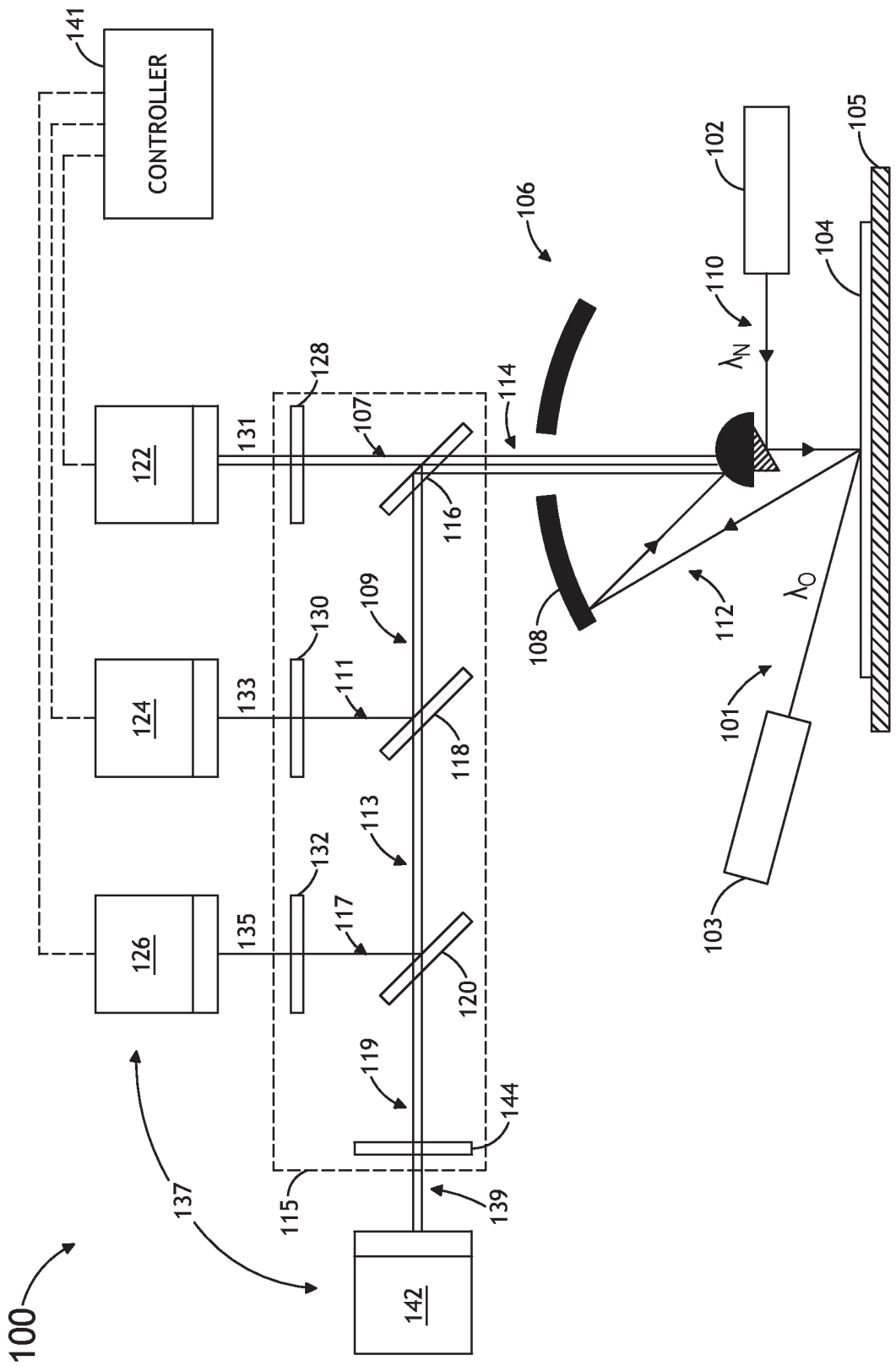

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CONTROLLER
141
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124
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131
133
135
128
130
132
107
109
111
113
116
118
120
119
144
115
139
137
142
106
114
108
102
105
104
110
λ_N
112
λ_O
101
103

FIG.1G

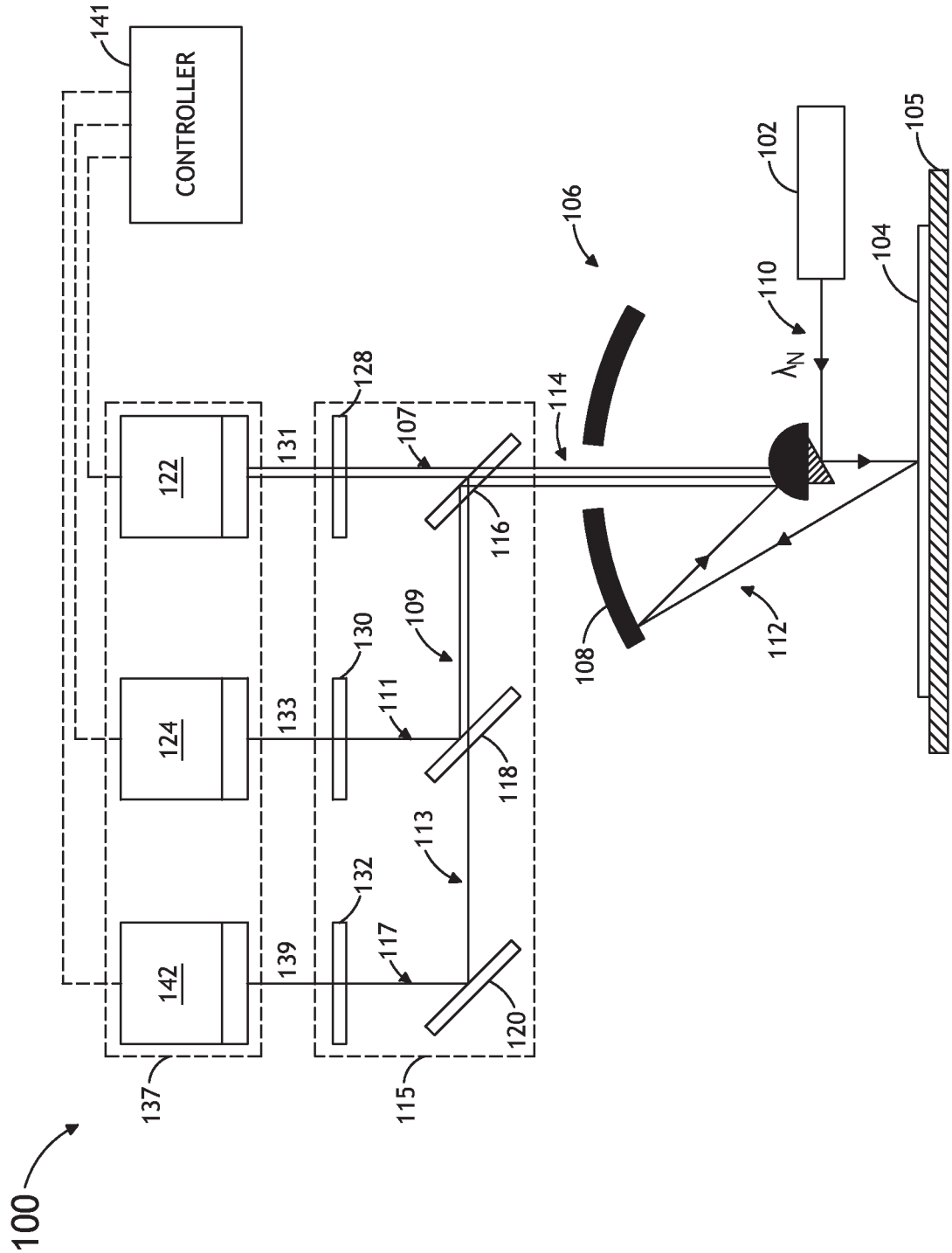

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137
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142
139
132
117
120
124
133
130
111
118
113
122
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128
107
116
109
114
106
108
112
110
λ_N
102
104
105
141
CONTROLLER

FIG.1H

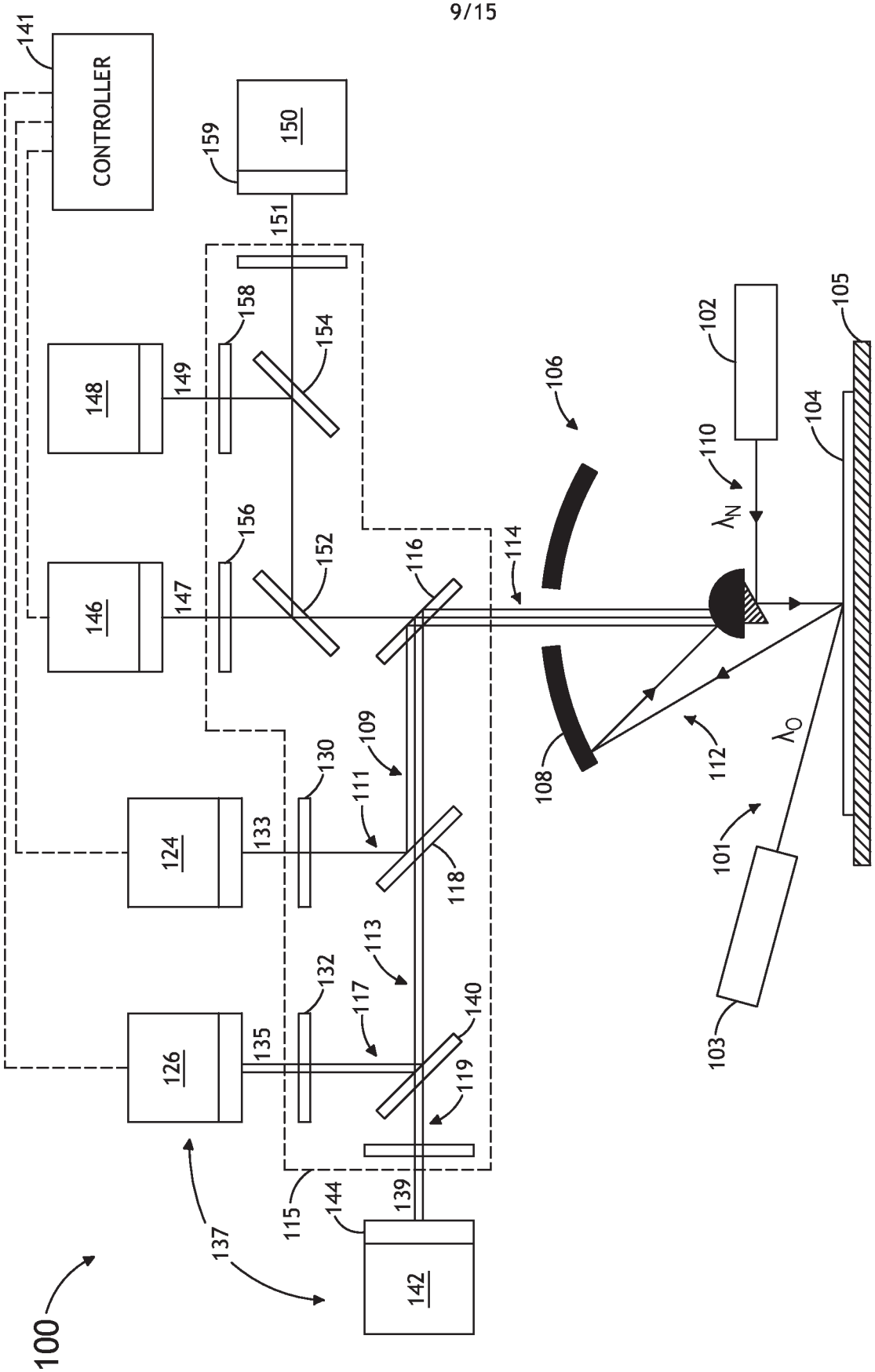

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CONTROLLER
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150
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151
148
149
158
154
146
147
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152
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114
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104
110
λ_N
124
133
130
109
111
118
108
112
λ_O
101
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132
113
117
140
119
103
137
115
144
139
142

FIG. 1I

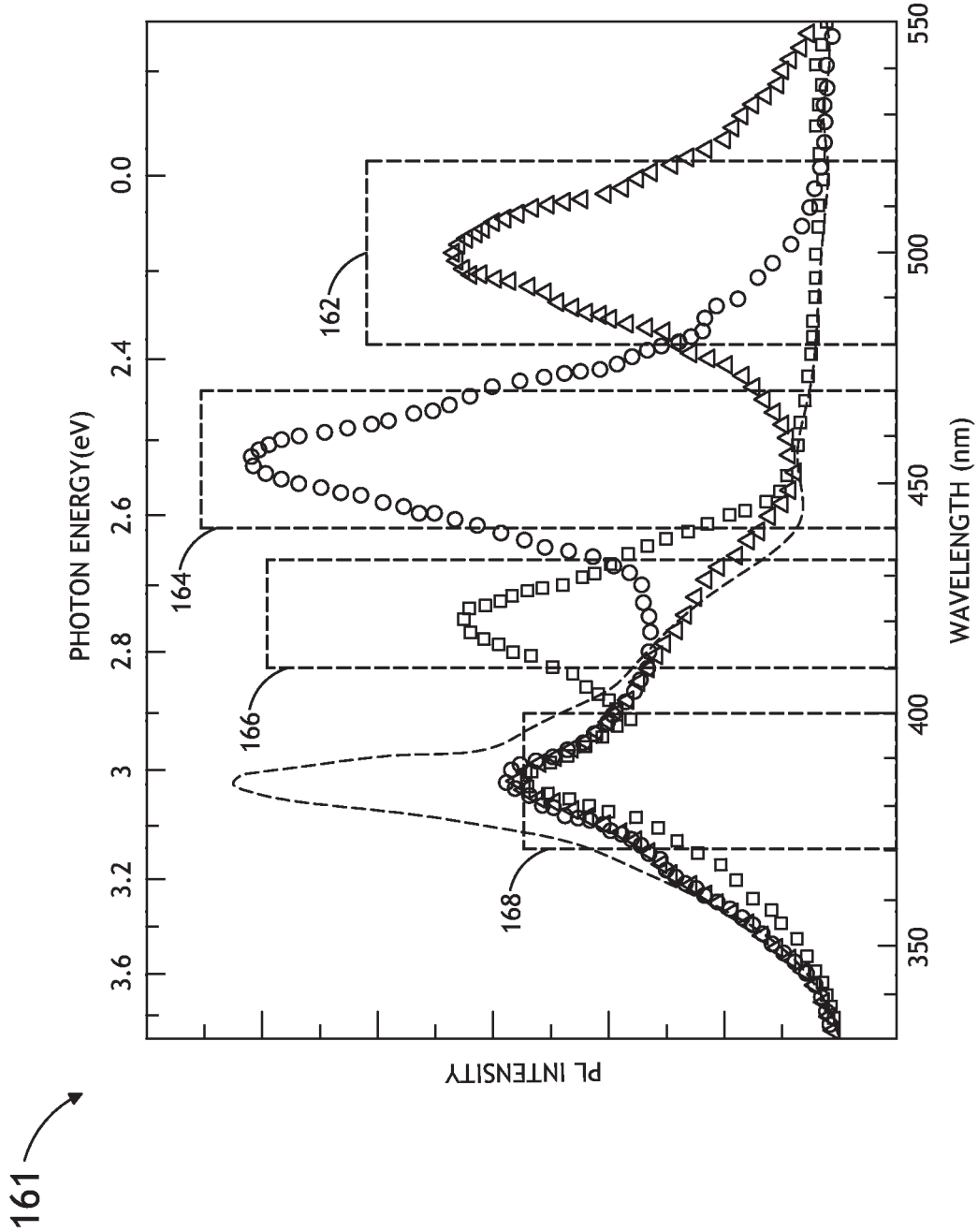

161
PL INTENSITY
PHOTON ENERGY(eV)
0.0
2.4
2.6
2.8
3
3.2
3.6
WAVELENGTH (nm)
550
500
450
400
350
162
164
166
168

FIG.1J

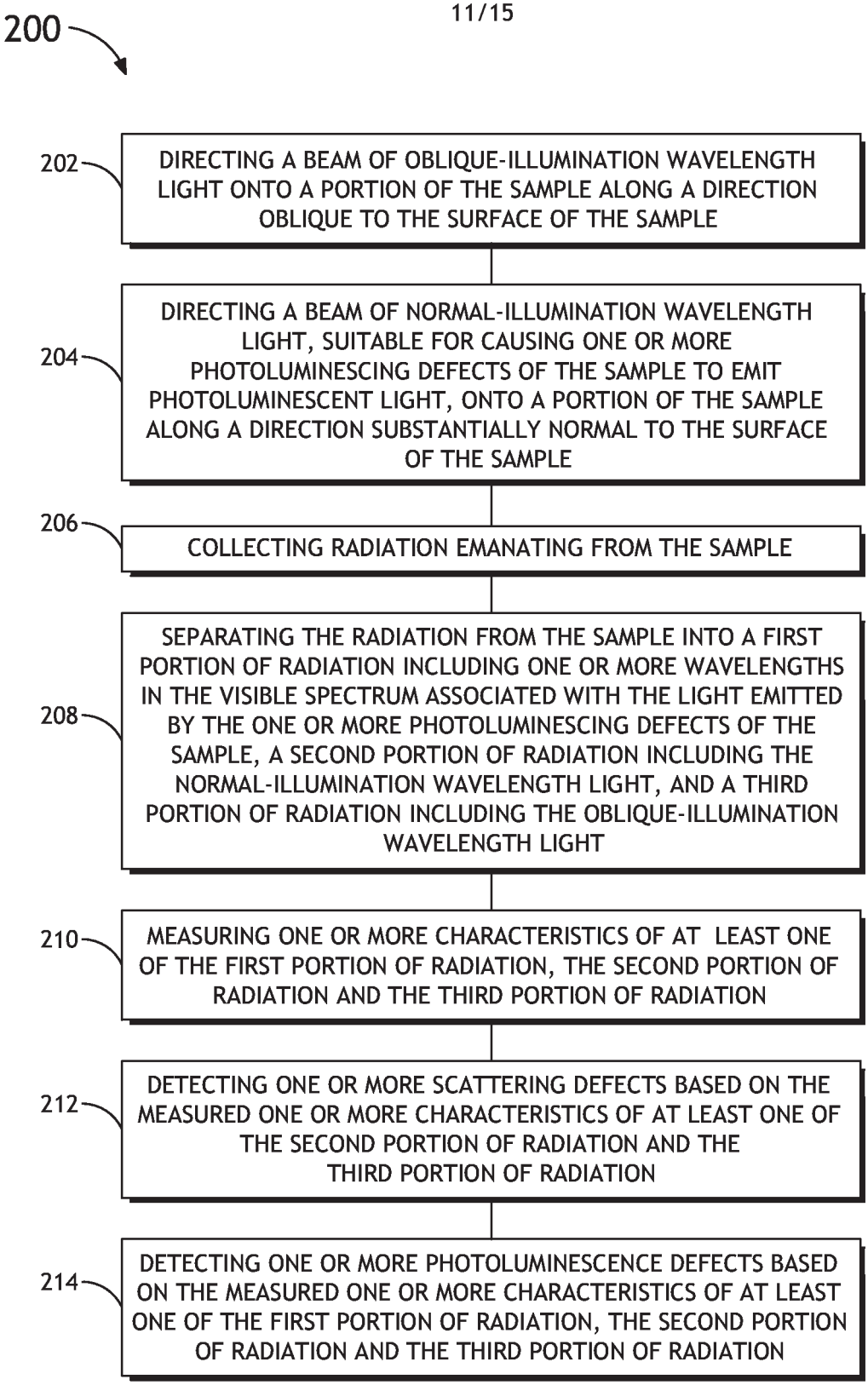

200
202
DIRECTING A BEAM OF OBLIQUE-ILLUMINATION WAVELENGTH LIGHT ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION OBLIQUE TO THE SURFACE OF THE SAMPLE
204
DIRECTING A BEAM OF NORMAL-ILLUMINATION WAVELENGTH LIGHT, SUITABLE FOR CAUSING ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE TO EMIT PHOTOLUMINESCENT LIGHT, ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION SUBSTANTIALLY NORMAL TO THE SURFACE OF THE SAMPLE
206
COLLECTING RADIATION EMANATING FROM THE SAMPLE
208
SEPARATING THE RADIATION FROM THE SAMPLE INTO A FIRST PORTION OF RADIATION INCLUDING ONE OR MORE WAVELENGTHS IN THE VISIBLE SPECTRUM ASSOCIATED WITH THE LIGHT EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE, A SECOND PORTION OF RADIATION INCLUDING THE NORMAL-ILLUMINATION WAVELENGTH LIGHT, AND A THIRD PORTION OF RADIATION INCLUDING THE OBLIQUE-ILLUMINATION WAVELENGTH LIGHT
210
MEASURING ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE FIRST PORTION OF RADIATION, THE SECOND PORTION OF RADIATION AND THE THIRD PORTION OF RADIATION
212
DETECTING ONE OR MORE SCATTERING DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE SECOND PORTION OF RADIATION AND THE THIRD PORTION OF RADIATION
214
DETECTING ONE OR MORE PHOTOLUMINESCENCE DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE FIRST PORTION OF RADIATION, THE SECOND PORTION OF RADIATION AND THE THIRD PORTION OF RADIATION

FIG.2

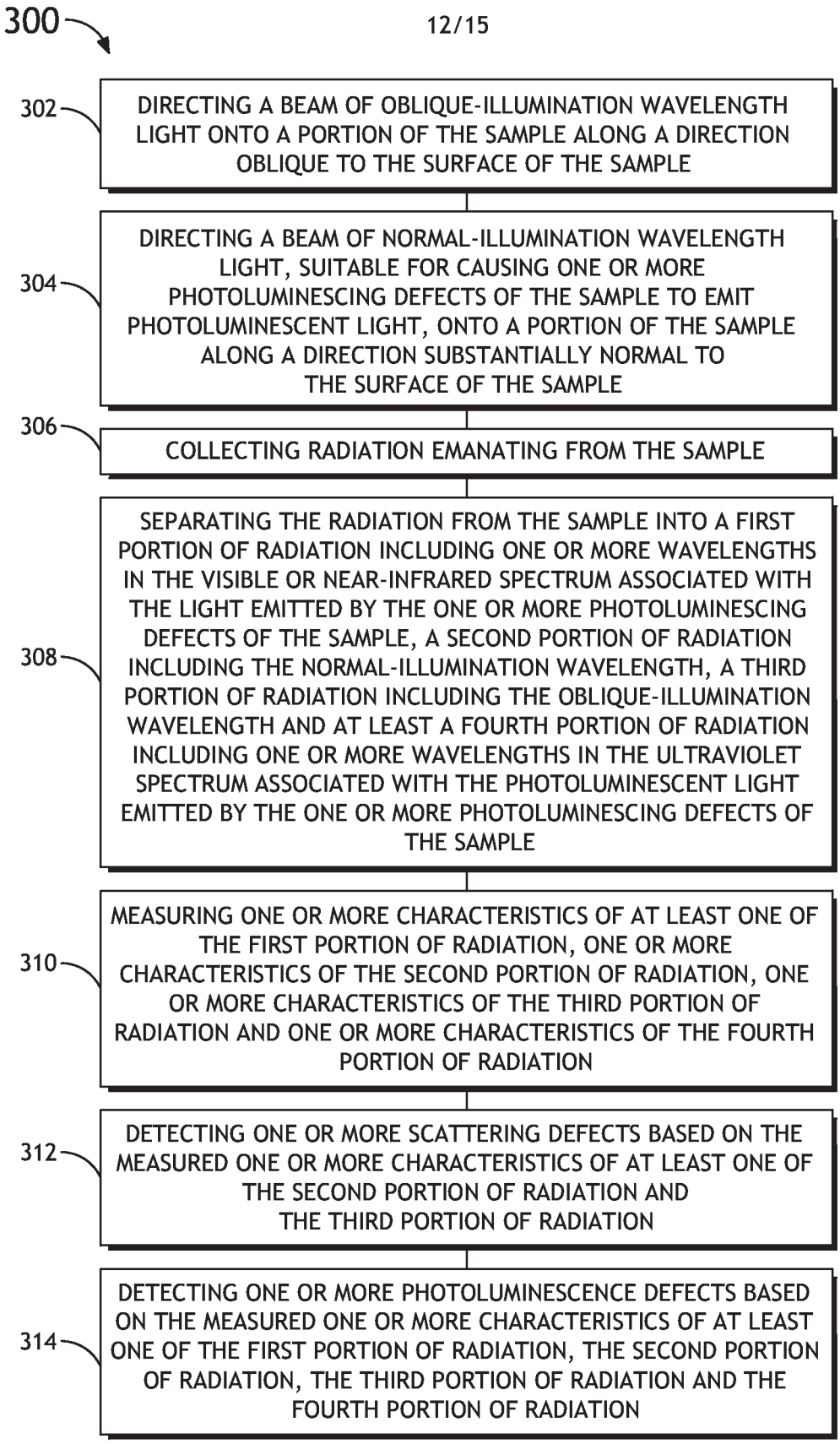

300
302
DIRECTING A BEAM OF OBLIQUE-ILLUMINATION WAVELENGTH LIGHT ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION OBLIQUE TO THE SURFACE OF THE SAMPLE
304
DIRECTING A BEAM OF NORMAL-ILLUMINATION WAVELENGTH LIGHT, SUITABLE FOR CAUSING ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE TO EMIT PHOTOLUMINESCENT LIGHT, ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION SUBSTANTIALLY NORMAL TO THE SURFACE OF THE SAMPLE
306
COLLECTING RADIATION EMANATING FROM THE SAMPLE
308
SEPARATING THE RADIATION FROM THE SAMPLE INTO A FIRST PORTION OF RADIATION INCLUDING ONE OR MORE WAVELENGTHS IN THE VISIBLE OR NEAR-INFRARED SPECTRUM ASSOCIATED WITH THE LIGHT EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE, A SECOND PORTION OF RADIATION INCLUDING THE NORMAL-ILLUMINATION WAVELENGTH, A THIRD PORTION OF RADIATION INCLUDING THE OBLIQUE-ILLUMINATION WAVELENGTH AND AT LEAST A FOURTH PORTION OF RADIATION INCLUDING ONE OR MORE WAVELENGTHS IN THE ULTRAVIOLET SPECTRUM ASSOCIATED WITH THE PHOTOLUMINESCENT LIGHT EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE
310
MEASURING ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE FIRST PORTION OF RADIATION, ONE OR MORE CHARACTERISTICS OF THE SECOND PORTION OF RADIATION, ONE OR MORE CHARACTERISTICS OF THE THIRD PORTION OF RADIATION AND ONE OR MORE CHARACTERISTICS OF THE FOURTH PORTION OF RADIATION
312
DETECTING ONE OR MORE SCATTERING DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE SECOND PORTION OF RADIATION AND THE THIRD PORTION OF RADIATION
314
DETECTING ONE OR MORE PHOTOLUMINESCENCE DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE FIRST PORTION OF RADIATION, THE SECOND PORTION OF RADIATION, THE THIRD PORTION OF RADIATION AND THE FOURTH PORTION OF RADIATION

FIG.3

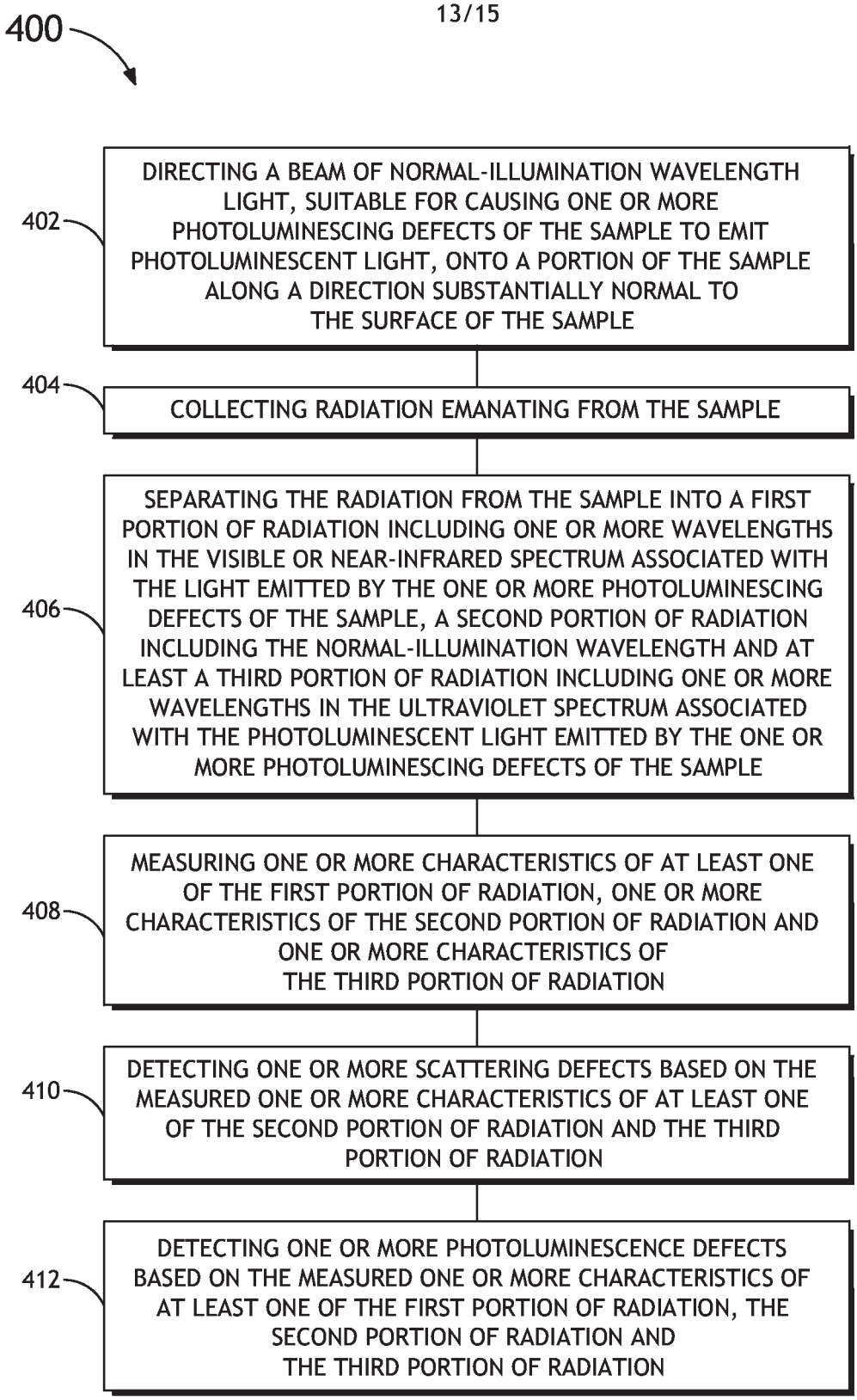

400
402
DIRECTING A BEAM OF NORMAL-ILLUMINATION WAVELENGTH LIGHT, SUITABLE FOR CAUSING ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE TO EMIT PHOTOLUMINESCENT LIGHT, ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION SUBSTANTIALLY NORMAL TO THE SURFACE OF THE SAMPLE
404
COLLECTING RADIATION EMANATING FROM THE SAMPLE
406
SEPARATING THE RADIATION FROM THE SAMPLE INTO A FIRST PORTION OF RADIATION INCLUDING ONE OR MORE WAVELENGTHS IN THE VISIBLE OR NEAR-INFRARED SPECTRUM ASSOCIATED WITH THE LIGHT EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE, A SECOND PORTION OF RADIATION INCLUDING THE NORMAL-ILLUMINATION WAVELENGTH AND AT LEAST A THIRD PORTION OF RADIATION INCLUDING ONE OR MORE WAVELENGTHS IN THE ULTRAVIOLET SPECTRUM ASSOCIATED WITH THE PHOTOLUMINESCENT LIGHT EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE
408
MEASURING ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE FIRST PORTION OF RADIATION, ONE OR MORE CHARACTERISTICS OF THE SECOND PORTION OF RADIATION AND ONE OR MORE CHARACTERISTICS OF THE THIRD PORTION OF RADIATION
410
DETECTING ONE OR MORE SCATTERING DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE SECOND PORTION OF RADIATION AND THE THIRD PORTION OF RADIATION
412
DETECTING ONE OR MORE PHOTOLUMINESCENCE DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF AT LEAST ONE OF THE FIRST PORTION OF RADIATION, THE SECOND PORTION OF RADIATION AND THE THIRD PORTION OF RADIATION

FIG.4

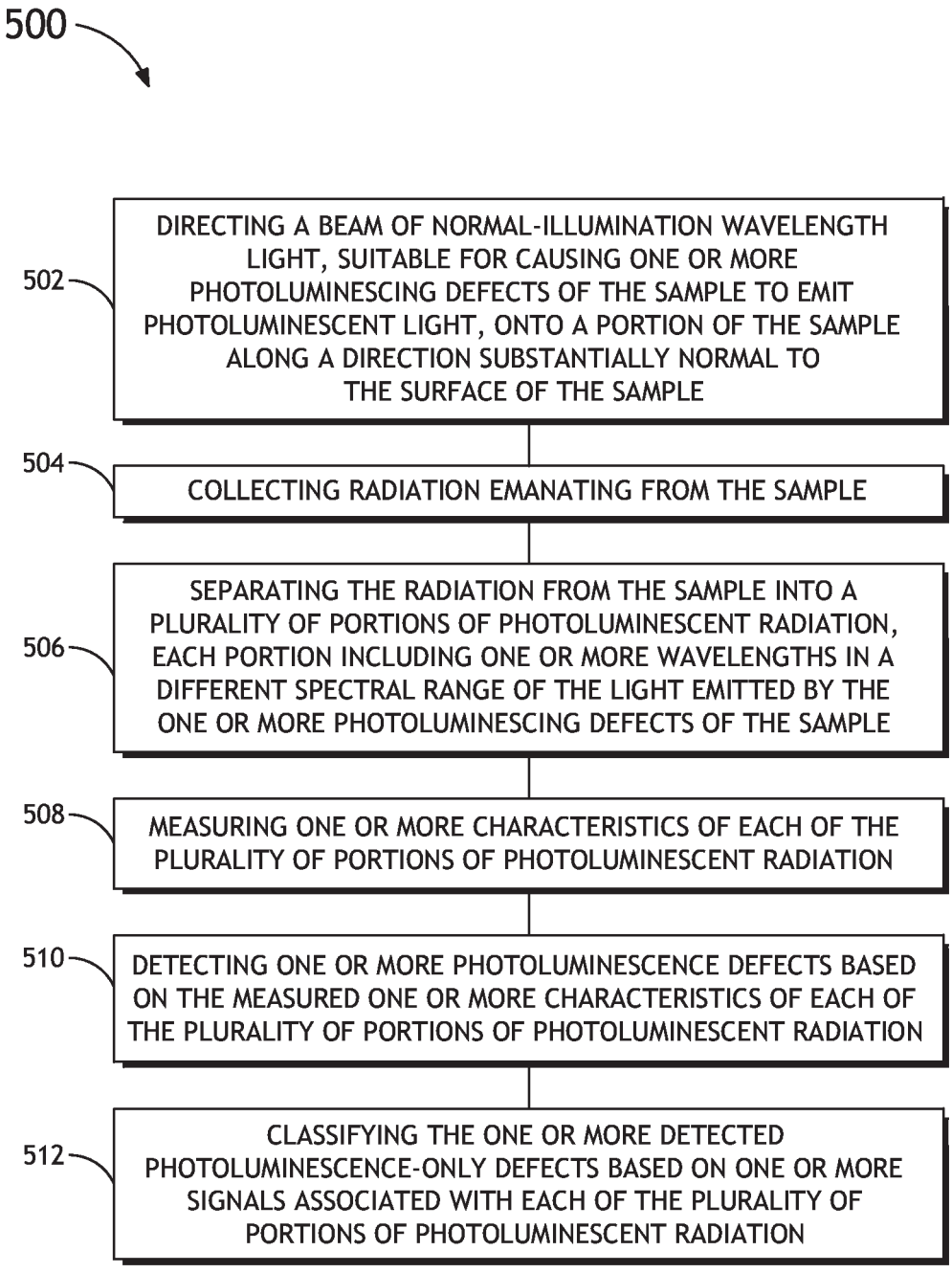

500
502
DIRECTING A BEAM OF NORMAL-ILLUMINATION WAVELENGTH LIGHT, SUITABLE FOR CAUSING ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE TO EMIT PHOTOLUMINESCENT LIGHT, ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION SUBSTANTIALLY NORMAL TO THE SURFACE OF THE SAMPLE
504
COLLECTING RADIATION EMANATING FROM THE SAMPLE
506
SEPARATING THE RADIATION FROM THE SAMPLE INTO A PLURALITY OF PORTIONS OF PHOTOLUMINESCENT RADIATION, EACH PORTION INCLUDING ONE OR MORE WAVELENGTHS IN A DIFFERENT SPECTRAL RANGE OF THE LIGHT EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE
508
MEASURING ONE OR MORE CHARACTERISTICS OF EACH OF THE PLURALITY OF PORTIONS OF PHOTOLUMINESCENT RADIATION
510
DETECTING ONE OR MORE PHOTOLUMINESCENCE DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF EACH OF THE PLURALITY OF PORTIONS OF PHOTOLUMINESCENT RADIATION
512
CLASSIFYING THE ONE OR MORE DETECTED PHOTOLUMINESCENCE-ONLY DEFECTS BASED ON ONE OR MORE SIGNALS ASSOCIATED WITH EACH OF THE PLURALITY OF PORTIONS OF PHOTOLUMINESCENT RADIATION

FIG.5

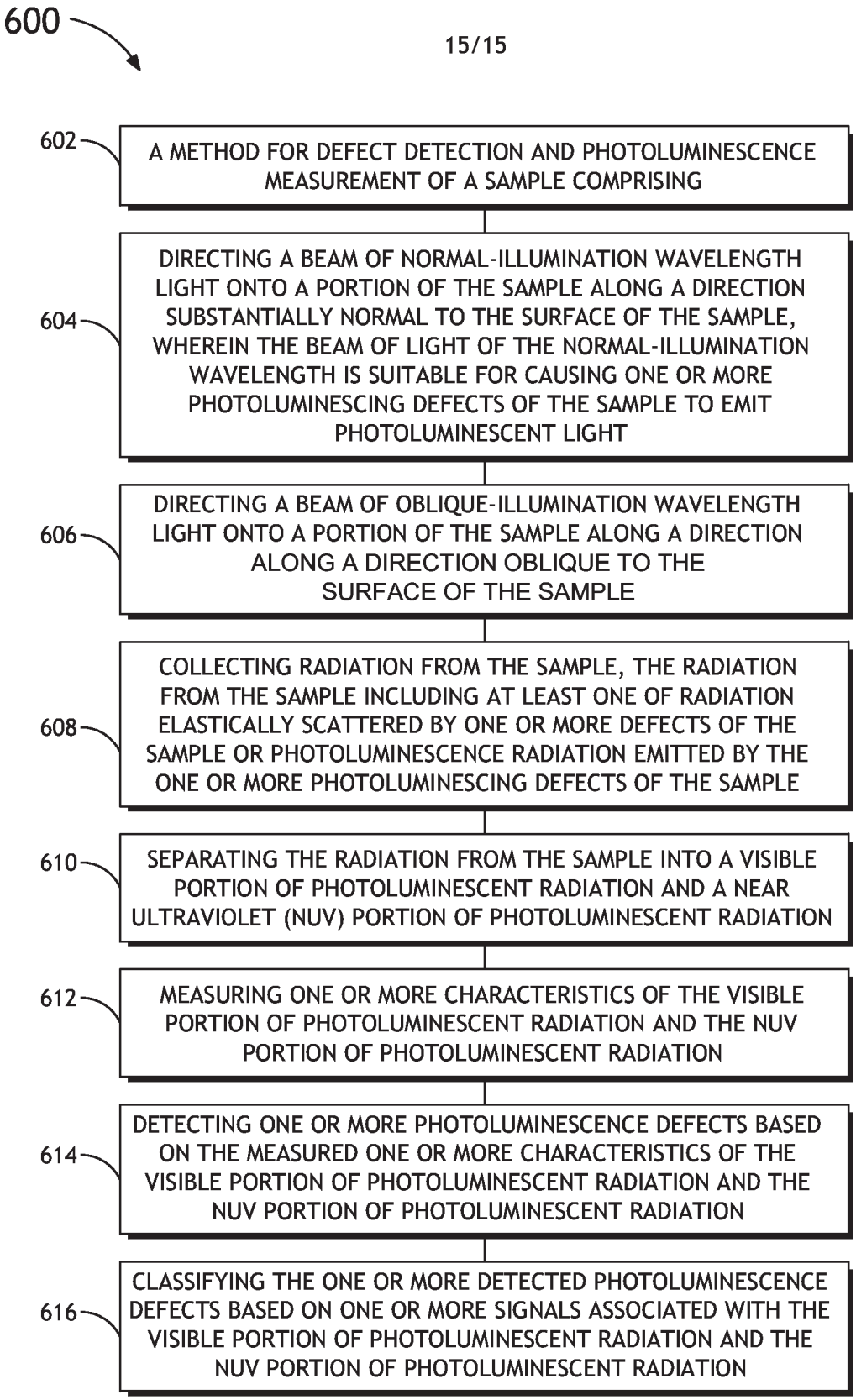

600
602
A METHOD FOR DEFECT DETECTION AND PHOTOLUMINESCENCE MEASUREMENT OF A SAMPLE COMPRISING
604
DIRECTING A BEAM OF NORMAL-ILLUMINATION WAVELENGTH LIGHT ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION SUBSTANTIALLY NORMAL TO THE SURFACE OF THE SAMPLE, WHEREIN THE BEAM OF LIGHT OF THE NORMAL-ILLUMINATION WAVELENGTH IS SUITABLE FOR CAUSING ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE TO EMIT PHOTOLUMINESCENT LIGHT
606
DIRECTING A BEAM OF OBLIQUE-ILLUMINATION WAVELENGTH LIGHT ONTO A PORTION OF THE SAMPLE ALONG A DIRECTION ALONG A DIRECTION OBLIQUE TO THE SURFACE OF THE SAMPLE
608
COLLECTING RADIATION FROM THE SAMPLE, THE RADIATION FROM THE SAMPLE INCLUDING AT LEAST ONE OF RADIATION ELASTICALLY SCATTERED BY ONE OR MORE DEFECTS OF THE SAMPLE OR PHOTOLUMINESCENCE RADIATION EMITTED BY THE ONE OR MORE PHOTOLUMINESCING DEFECTS OF THE SAMPLE
610
SEPARATING THE RADIATION FROM THE SAMPLE INTO A VISIBLE PORTION OF PHOTOLUMINESCENT RADIATION AND A NEAR ULTRAVIOLET (NUV) PORTION OF PHOTOLUMINESCENT RADIATION
612
MEASURING ONE OR MORE CHARACTERISTICS OF THE VISIBLE PORTION OF PHOTOLUMINESCENT RADIATION AND THE NUV PORTION OF PHOTOLUMINESCENT RADIATION
614
DETECTING ONE OR MORE PHOTOLUMINESCENCE DEFECTS BASED ON THE MEASURED ONE OR MORE CHARACTERISTICS OF THE VISIBLE PORTION OF PHOTOLUMINESCENT RADIATION AND THE NUV PORTION OF PHOTOLUMINESCENT RADIATION
616
CLASSIFYING THE ONE OR MORE DETECTED PHOTOLUMINESCENCE DEFECTS BASED ON ONE OR MORE SIGNALS ASSOCIATED WITH THE VISIBLE PORTION OF PHOTOLUMINESCENT RADIATION AND THE NUV PORTION OF PHOTOLUMINESCENT RADIATION

FIG.6