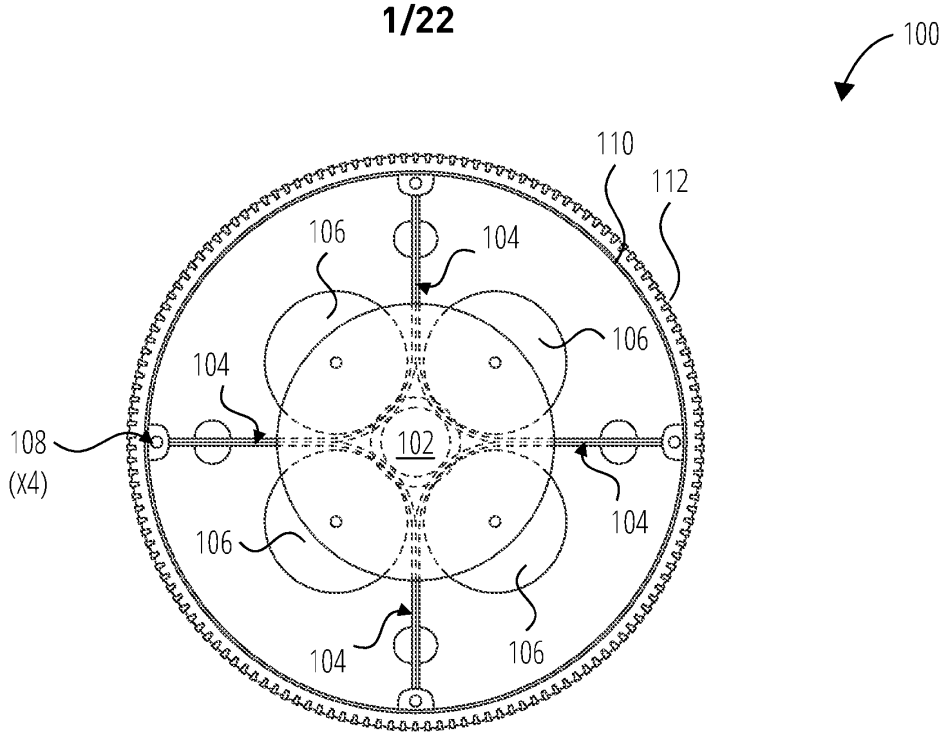

100
110
112
106
104
104
106
108
(X4)
102
104
106
104
106

FIG. 1A

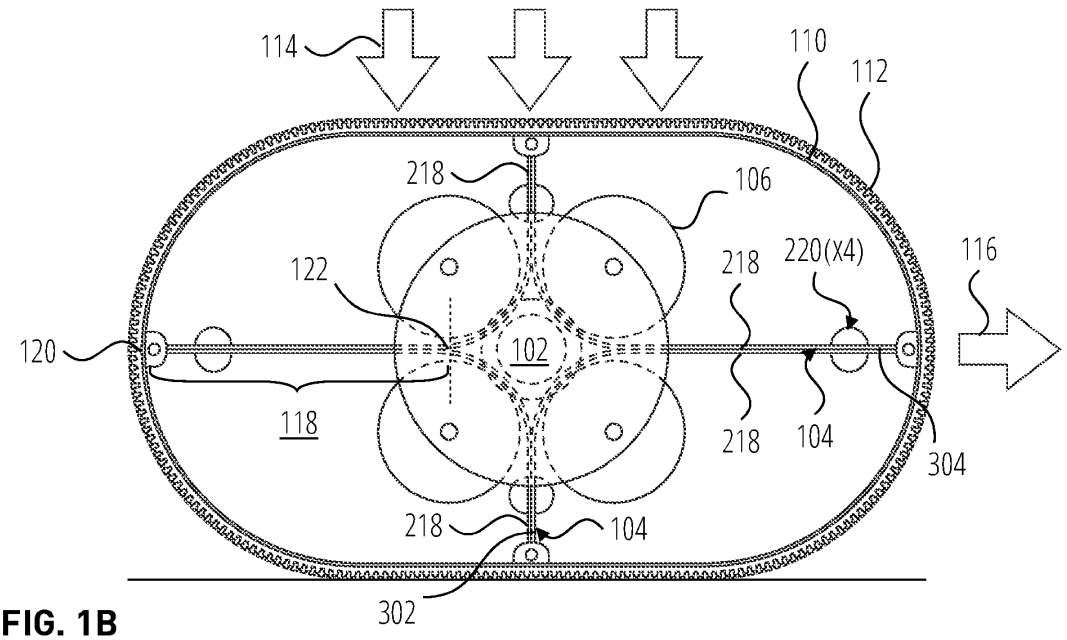

114
110
112
218
106
122
218
220(X4)
116
120
102
118
218
104
304
218
104
302

FIG. 1B

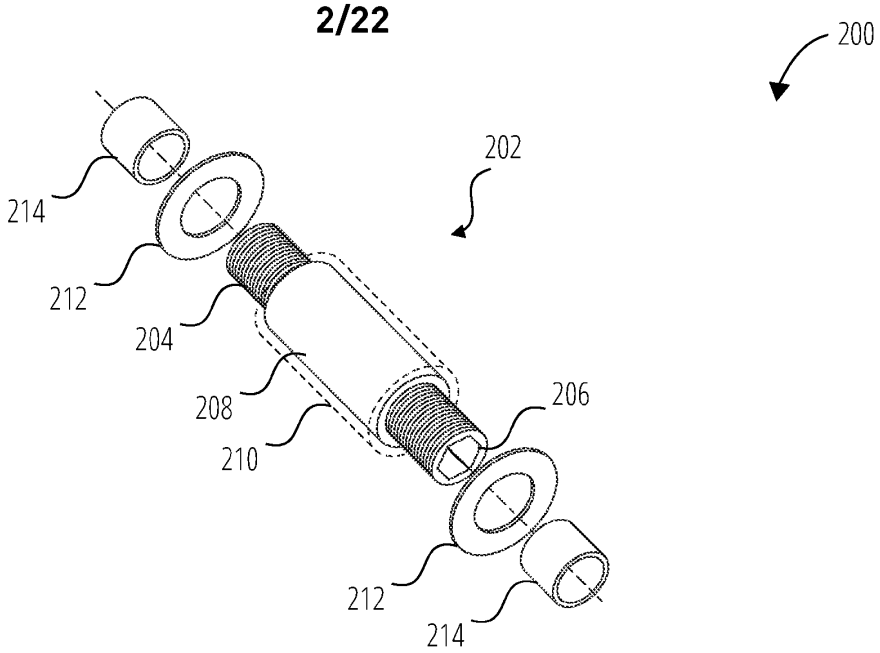

200
202
214
212
204
208
210
206
212
214

FIG. 2A

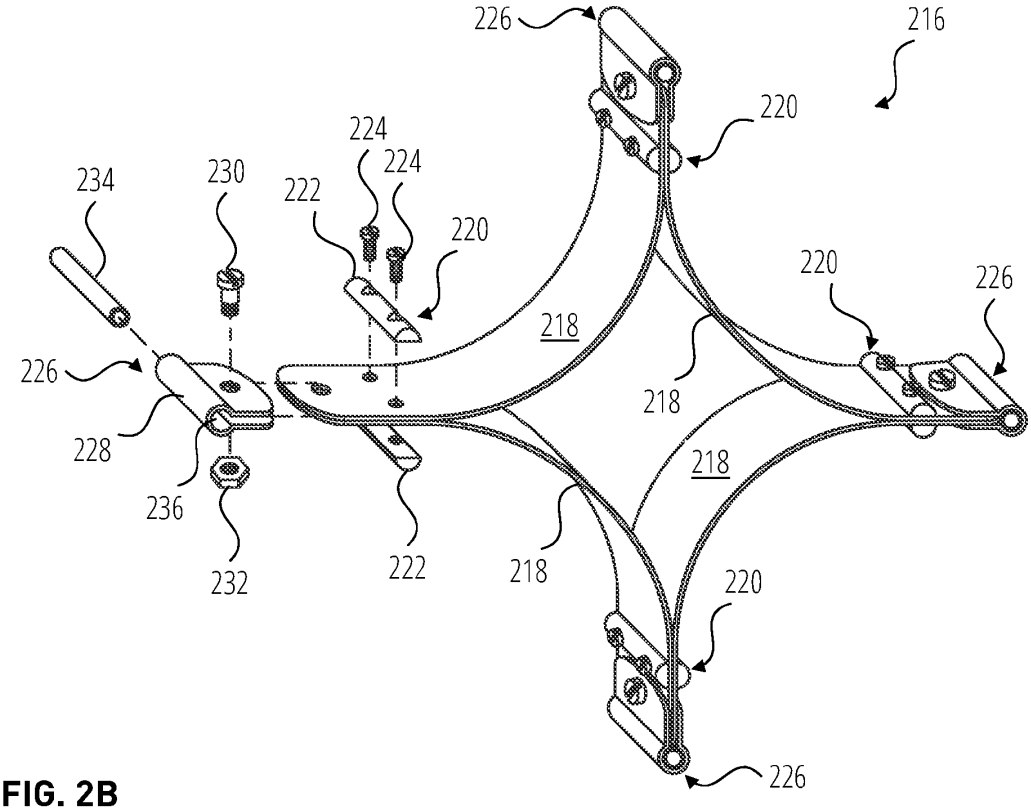

226
216
220
224
224
234
230
222
220
220
226
218
226
218
228
218
236
222
218
232
220
226

FIG. 2B

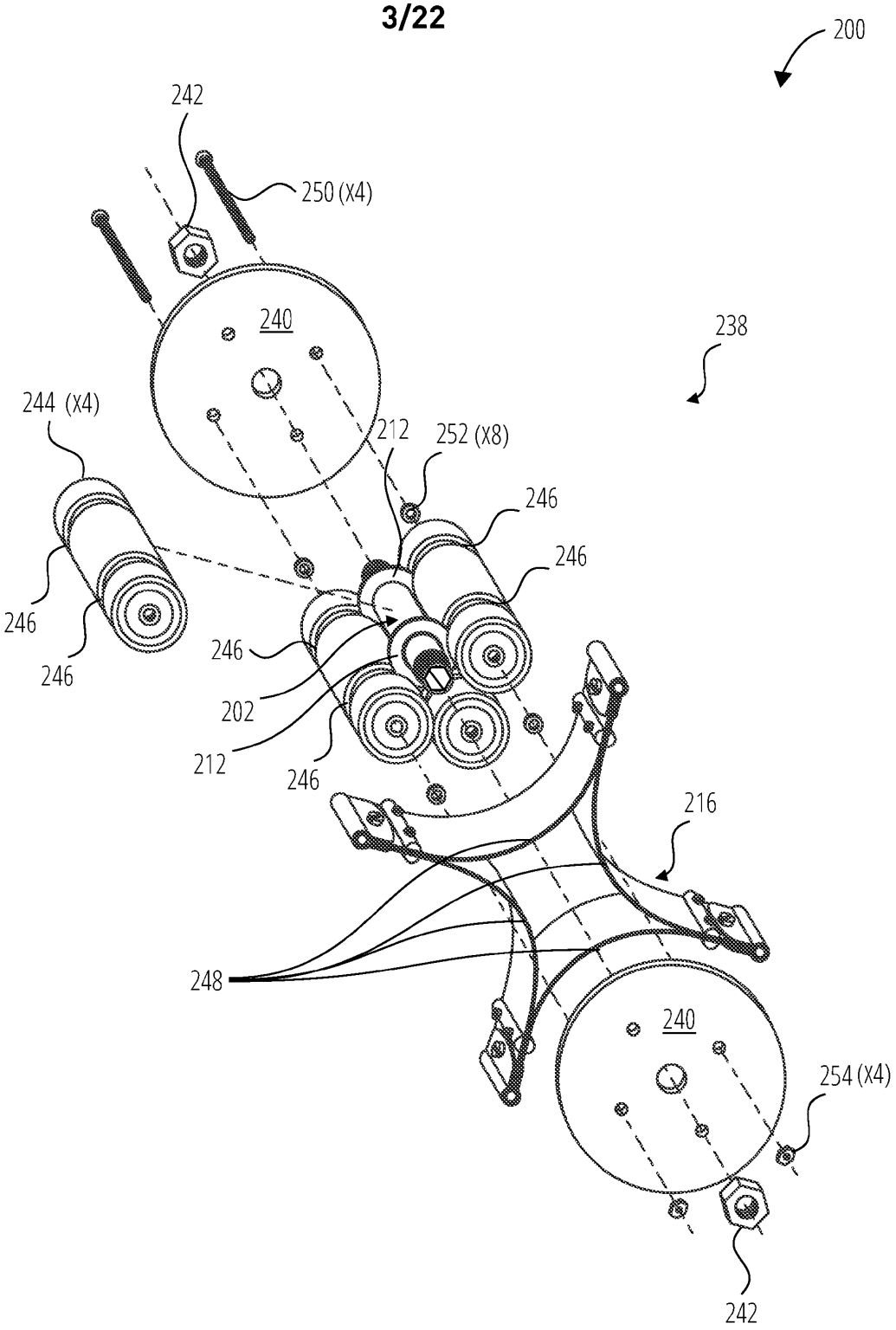

200
242
250 (X4)
240
238
244 (X4)
212
252 (X8)
246
246
246
246
246
246
202
212
246
216
248
240
254 (X4)
242

FIG. 2C

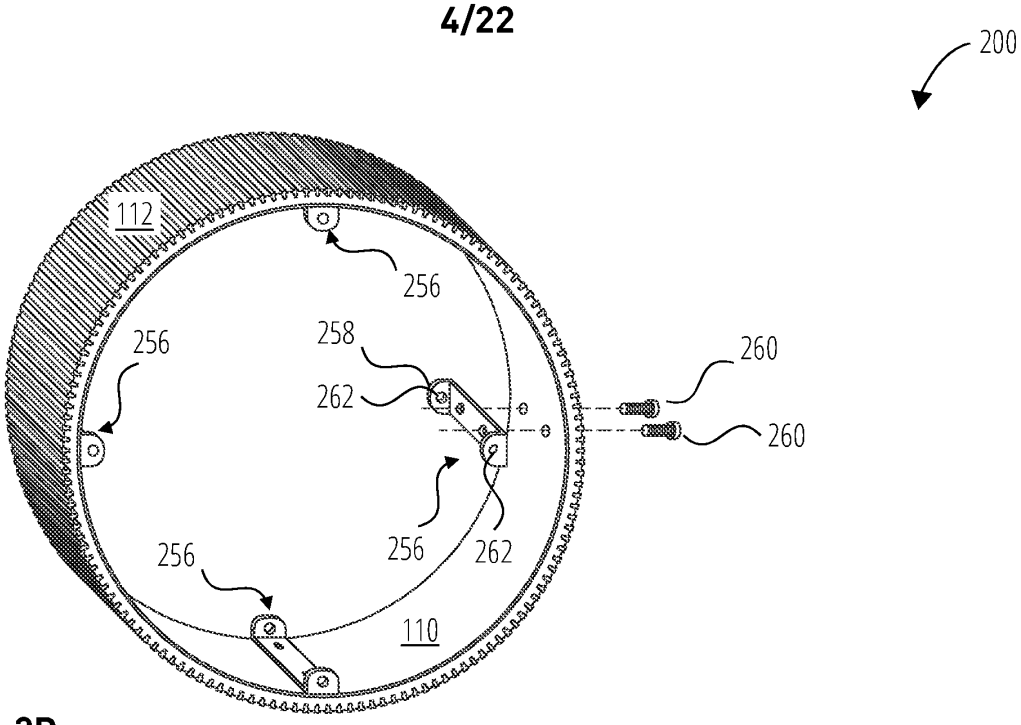

200
112
256
256
258
262
260
260
256
256
262
110

FIG. 2D

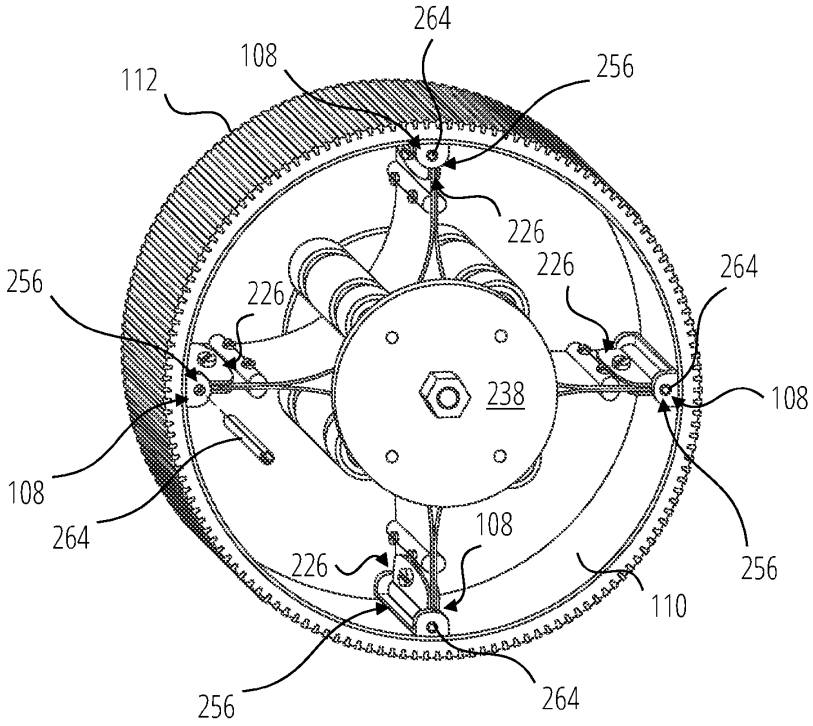

264
108
112
256
226
226
226
256
264
238
108
108
264
108
226
256
110
256
264

FIG. 2E

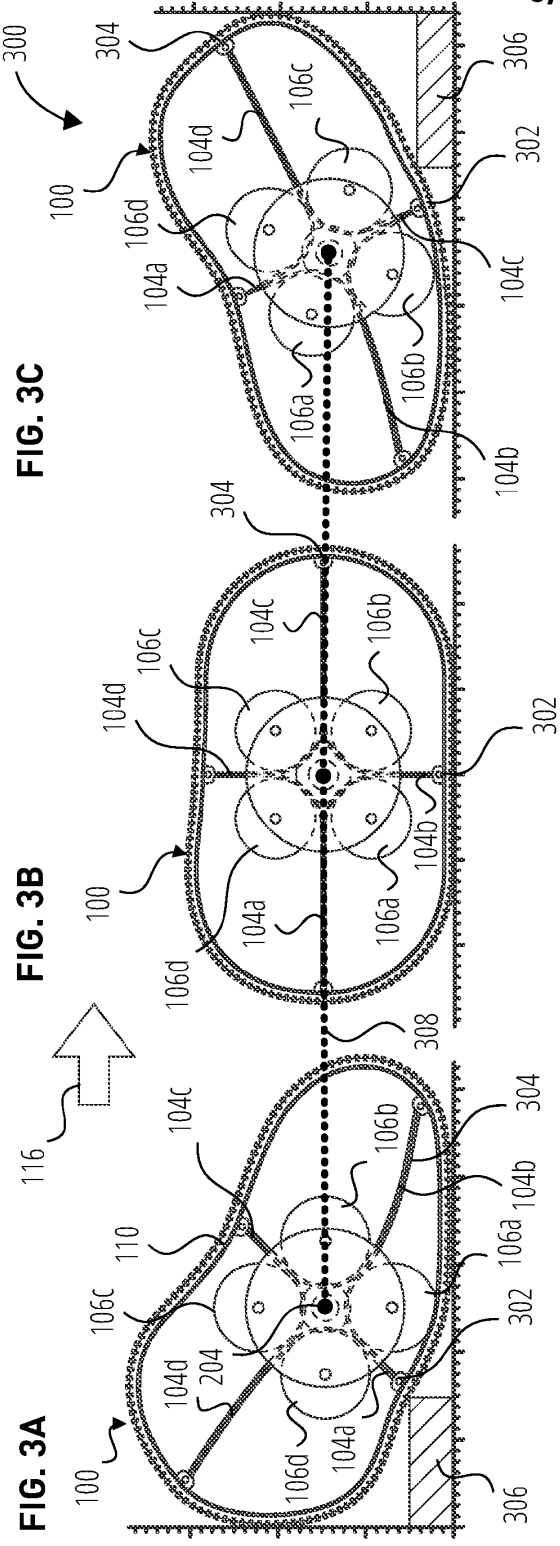


FIG. 3A

FIG. 3B

FIG. 3C

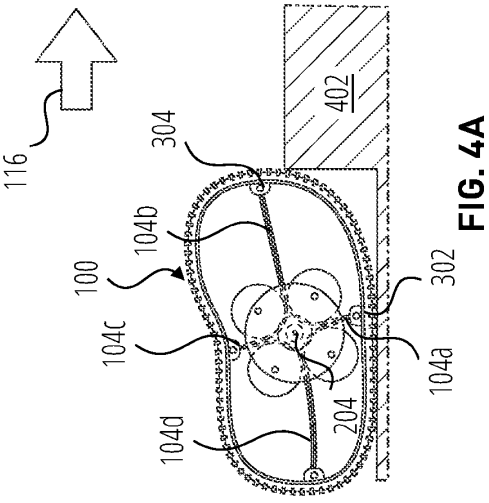


FIG. 4A

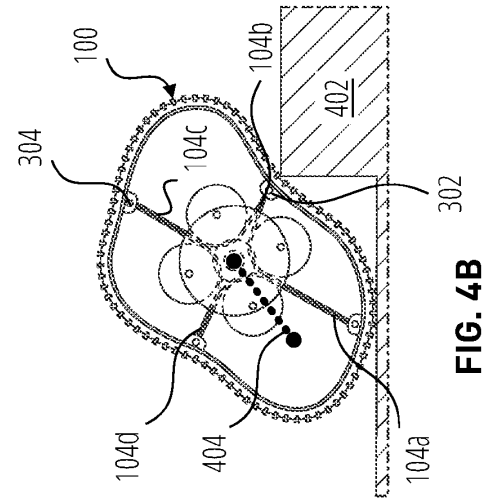


FIG. 4B

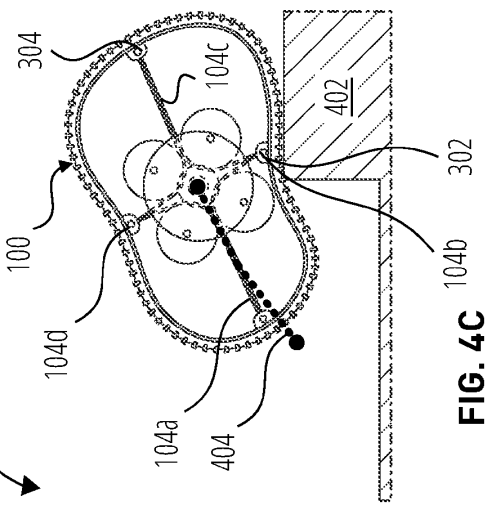


FIG. 4C

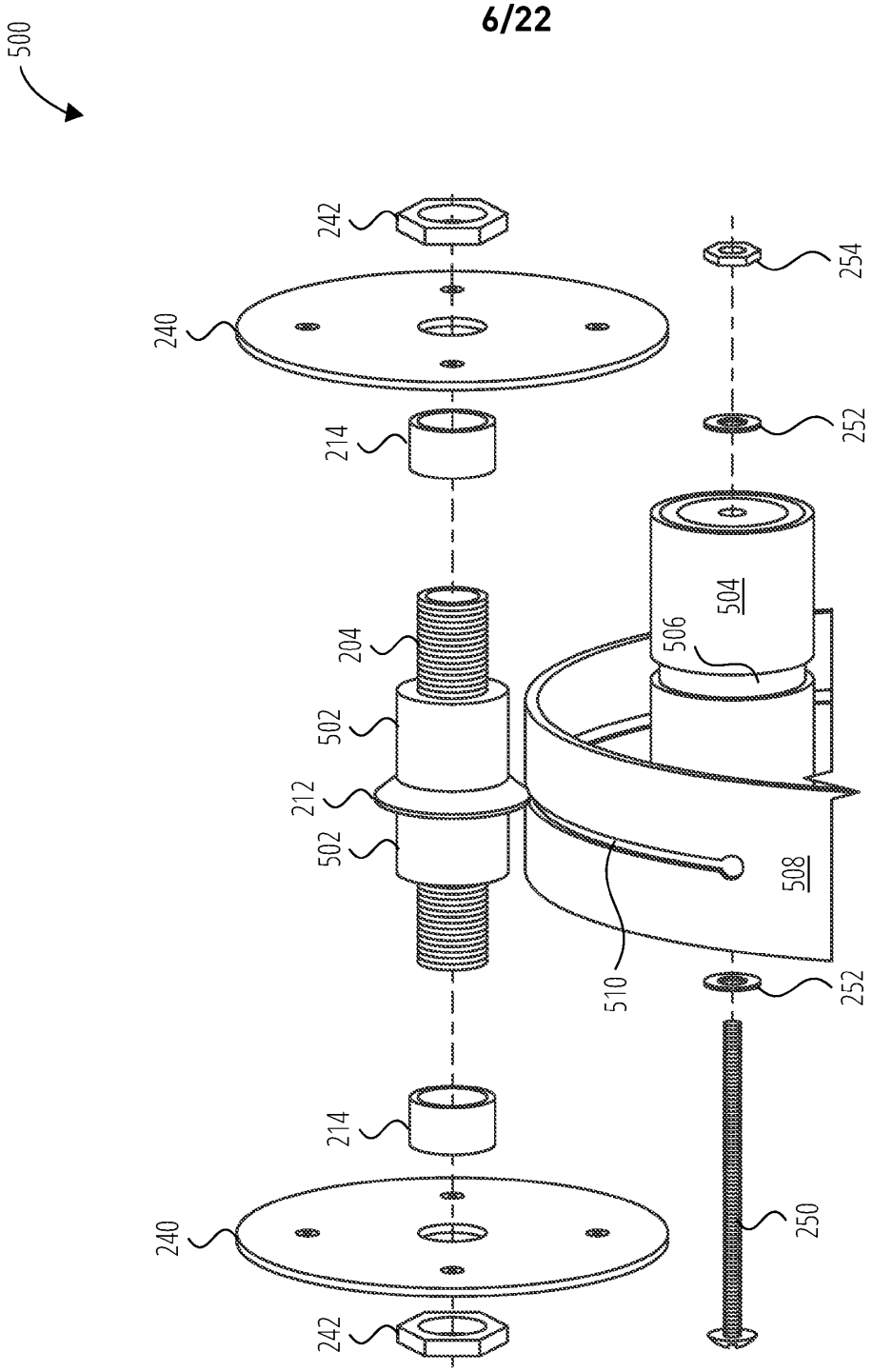

500
242
240
214
204
502
212
502
214
240
242
254
252
504
506
508
510
252
250

FIG. 5A

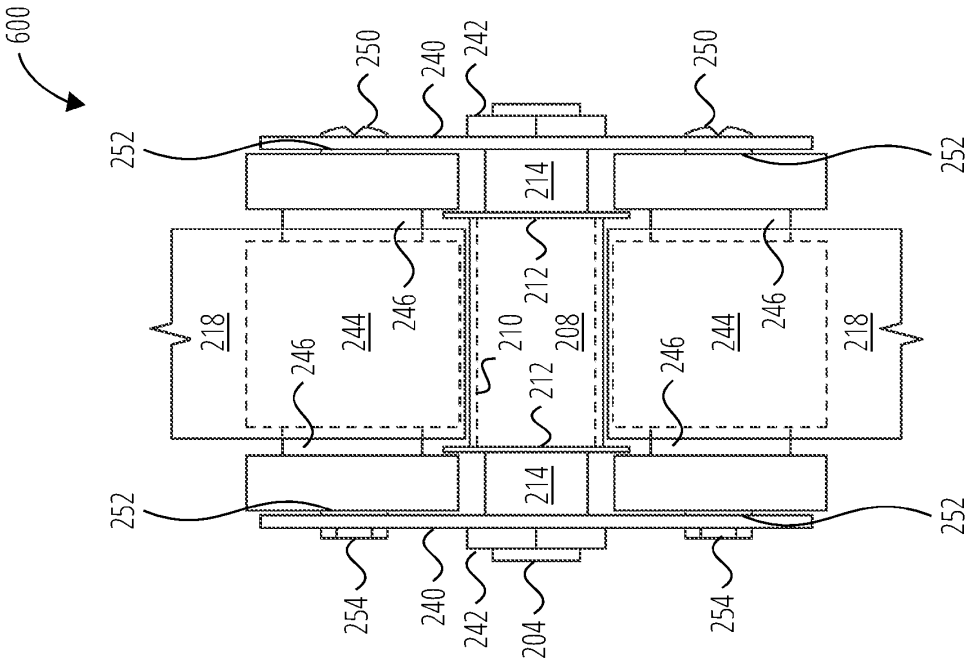

600
250
240
242
250
252
252
214
218
246
244
246
212
210
208
212
246
244
246
218
214
252
252
254
240
242
204
254

FIG. 6

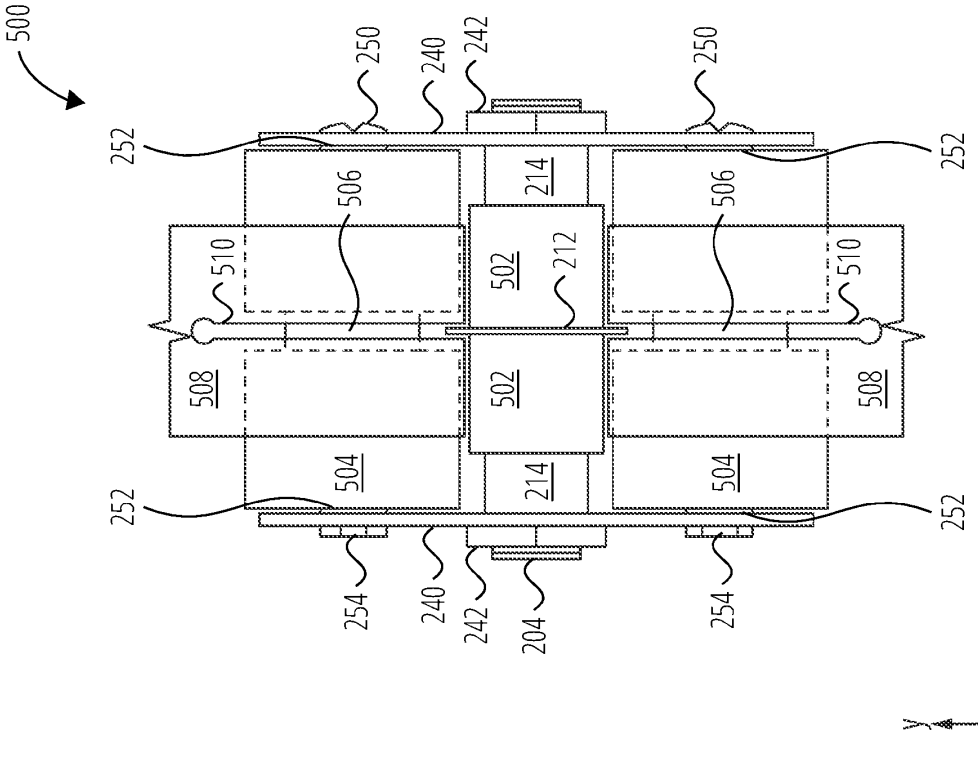

500
250
240
242
250
252
252
214
506
506
510
502
212
510
508
502
508
504
214
504
252
252
254
240
242
204
254
X
Y
Z

FIG. 5B

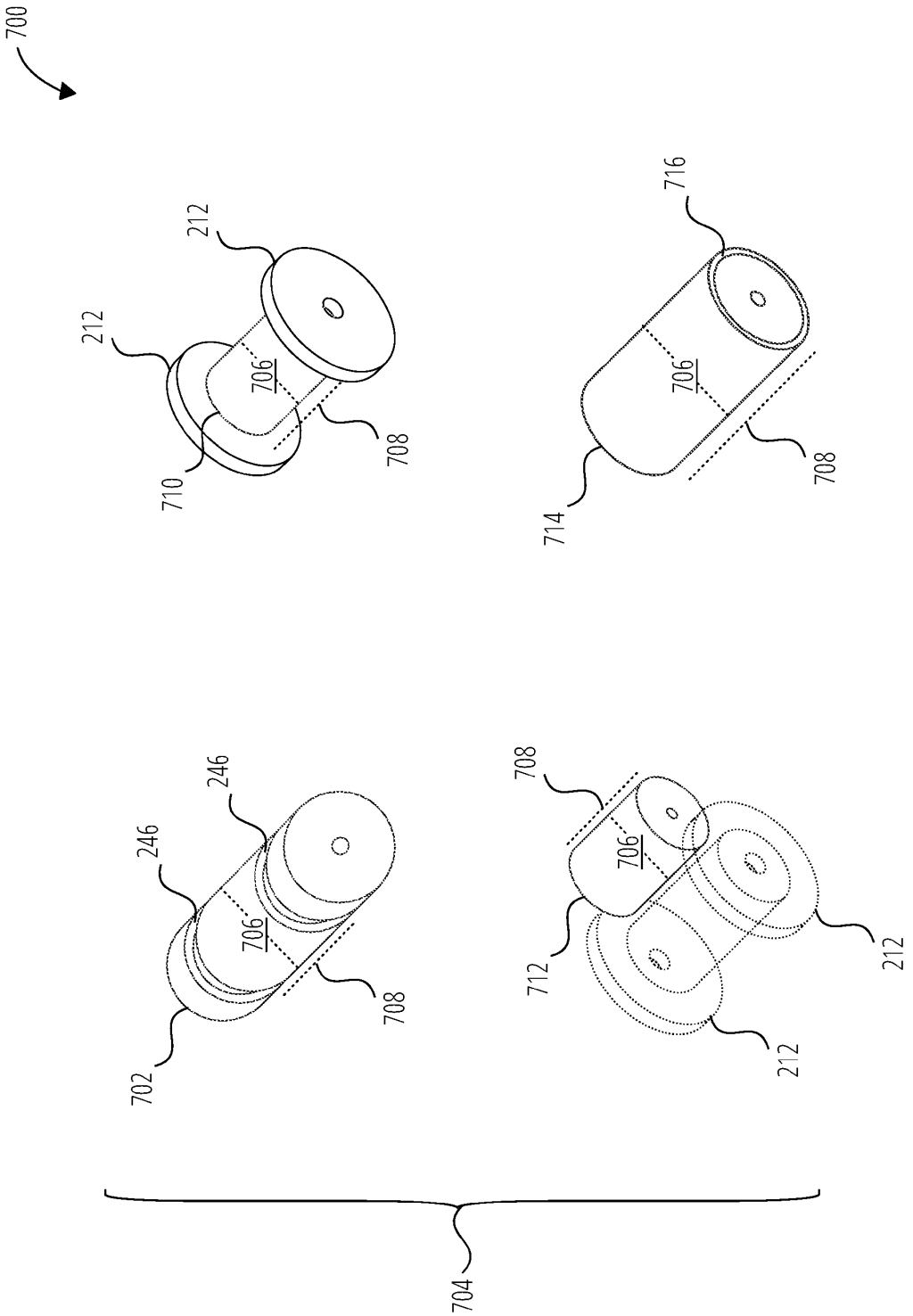

700
212
212
706
708
710
716
706
708
714
246
246
706
708
702
708
706
712
212
212
704

FIG. 7A

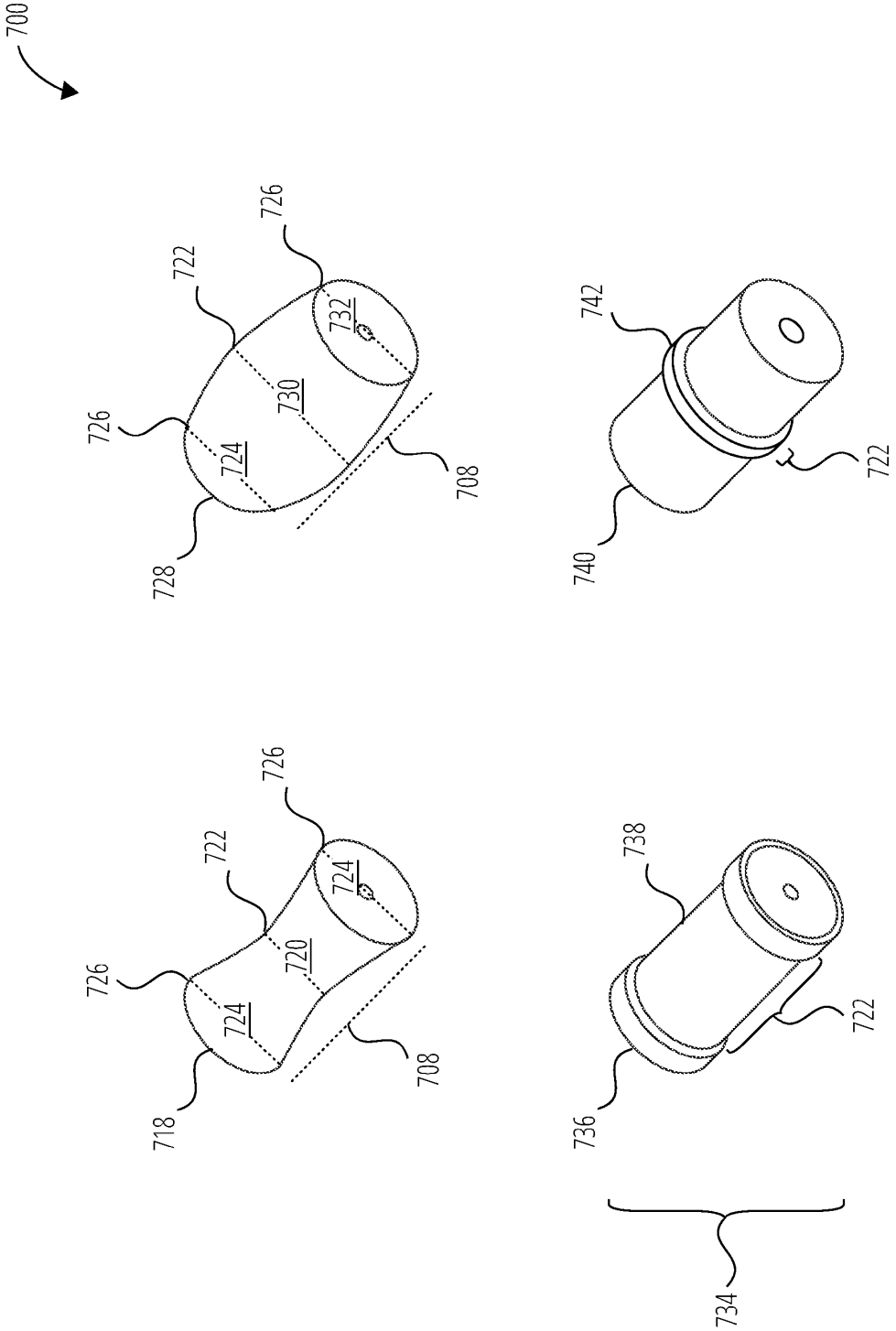

700
726
722
732
730
726
724
728
708
742
722
740
726
722
724
720
726
724
718
708
738
722
736
734

FIG. 7B

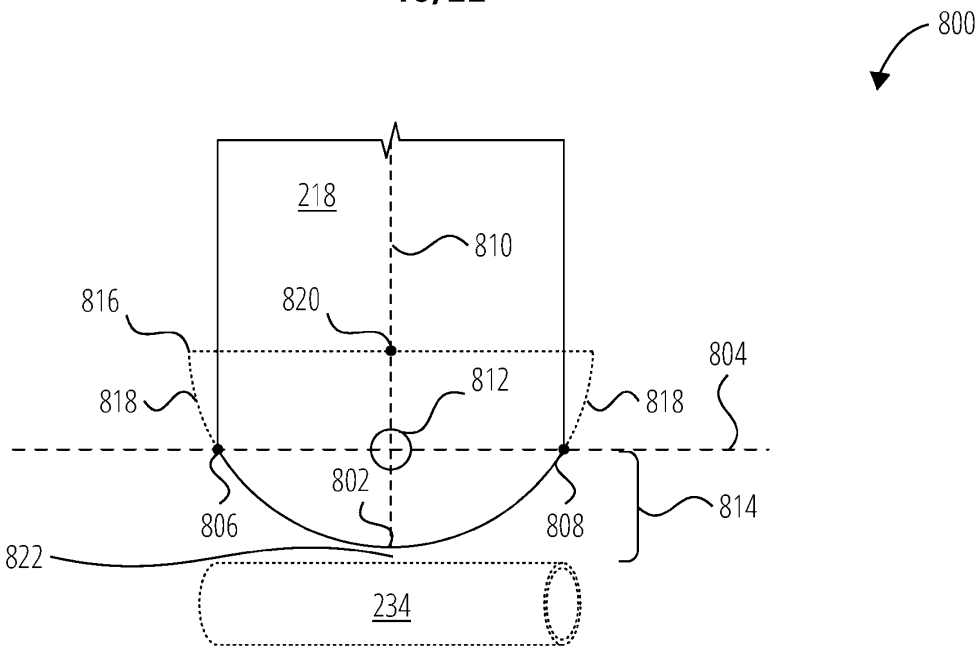

800
218
810
816
820
804
818
812
818
802
806
808
814
822
234

FIG. 8A

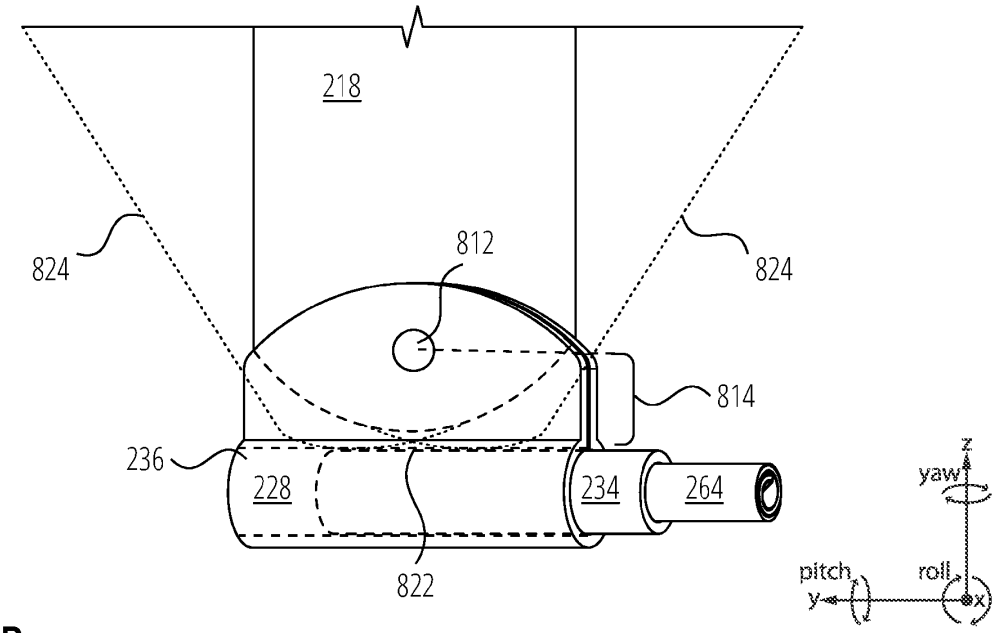

218
824
812
824
814
236
228
234
264
822
z
yaw
pitch
roll
y
x

FIG. 8B

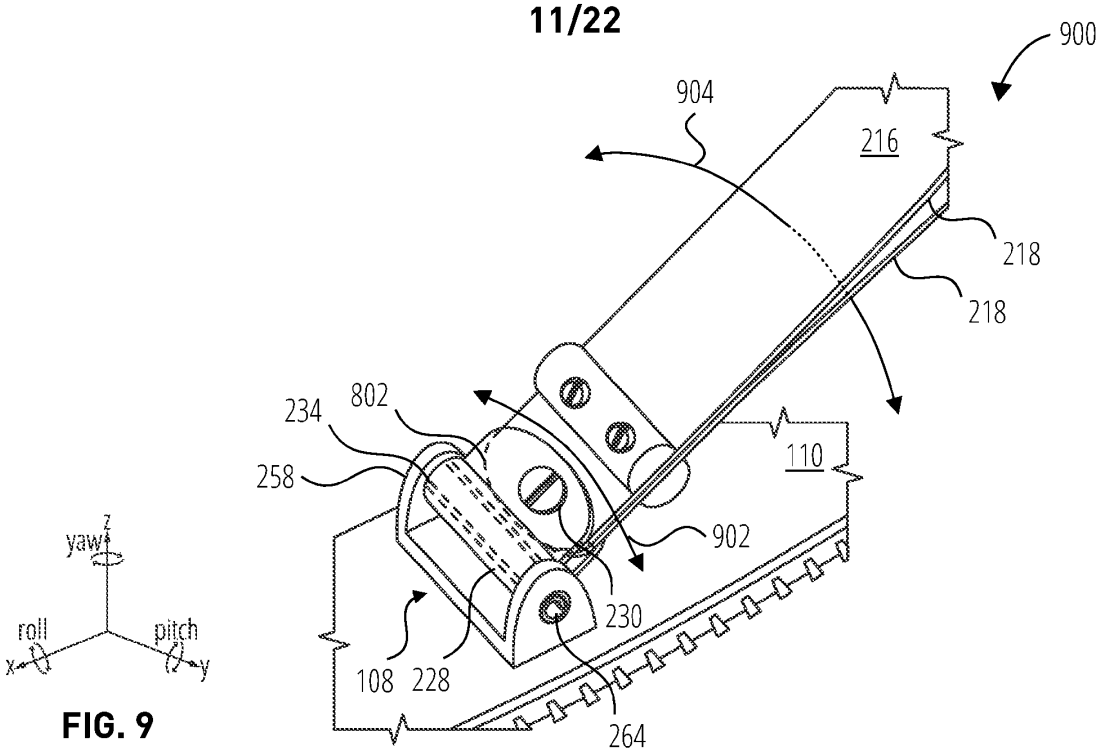

900
904
216
218
218
234
802
258
110
902
230
108
228
264
z
yaw
roll
pitch
x
y

FIG. 9

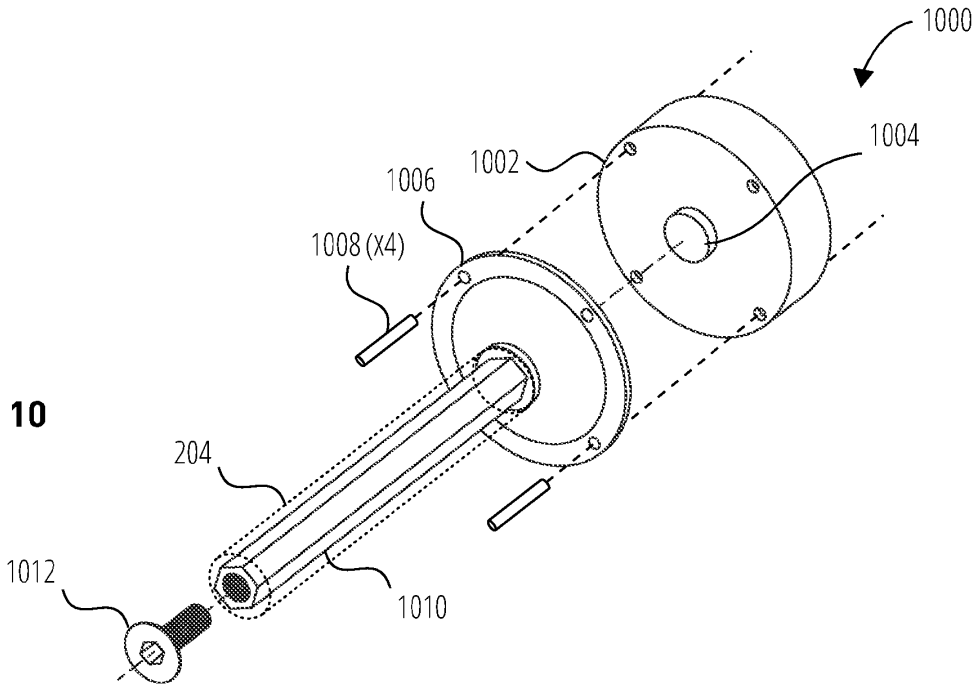

1000
1004
1002
1006
1008 (X4)
204
1012
1010

FIG. 10

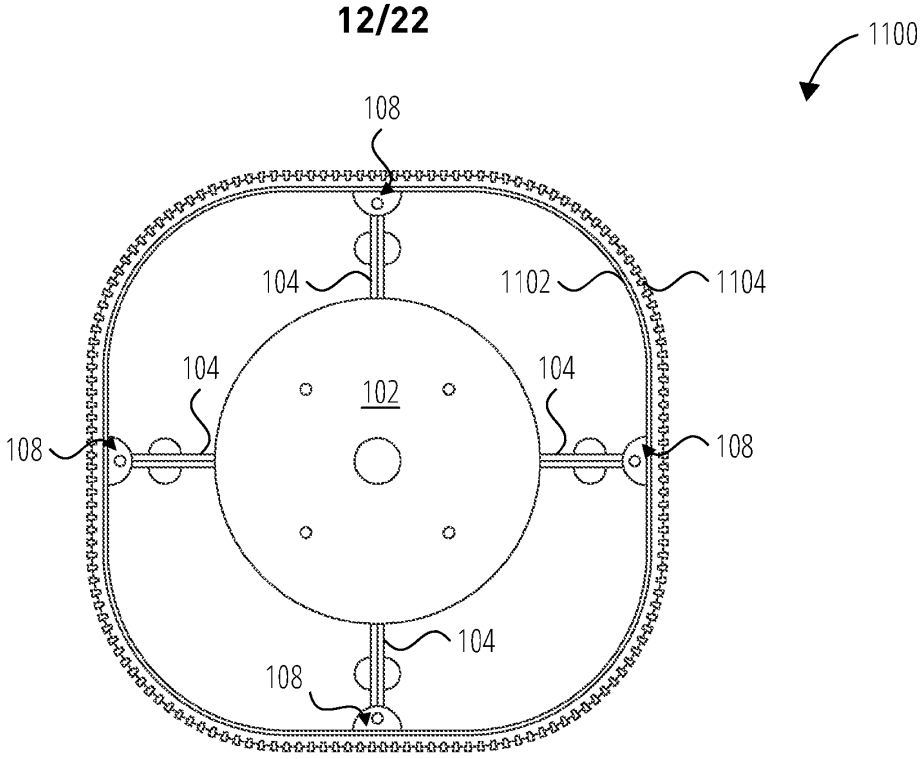


FIG. 11A

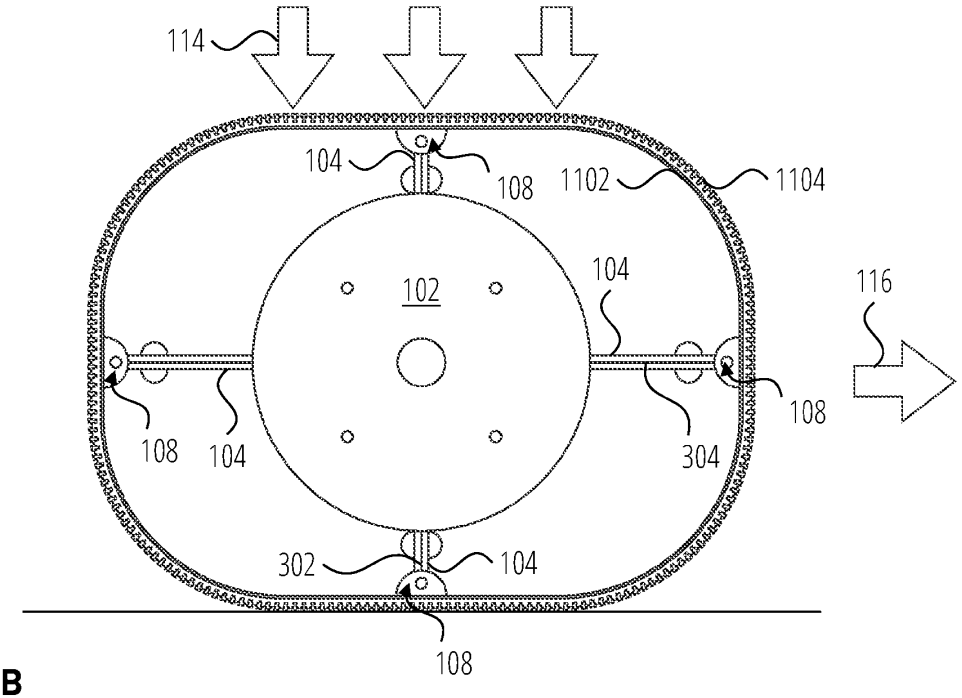


FIG. 11B

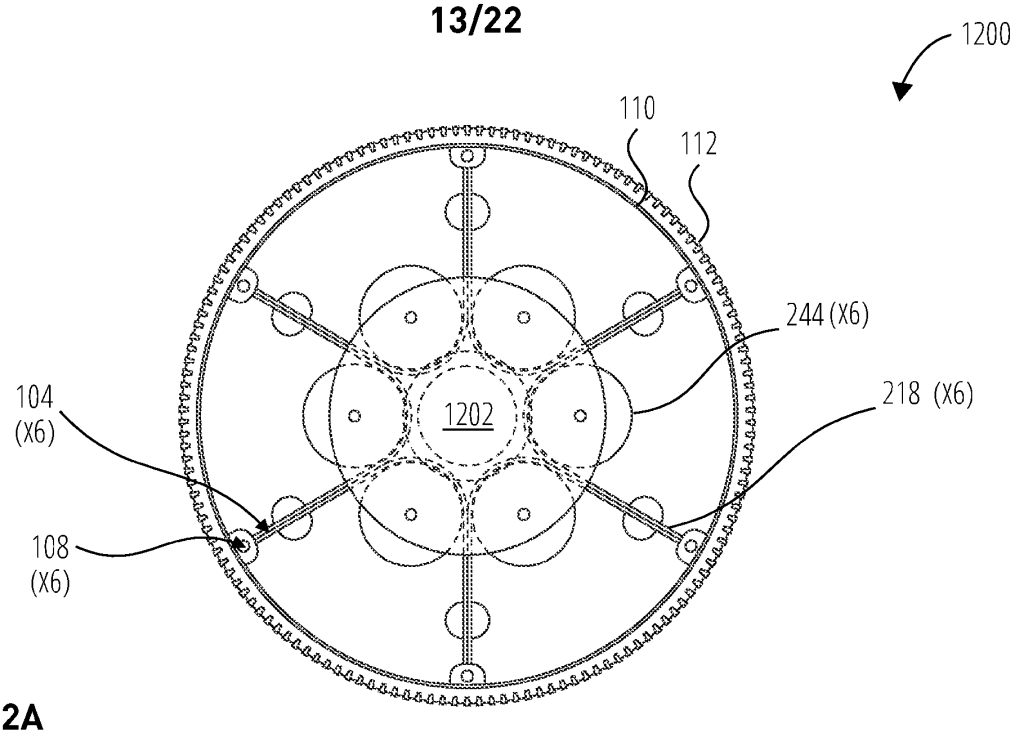


FIG. 12A

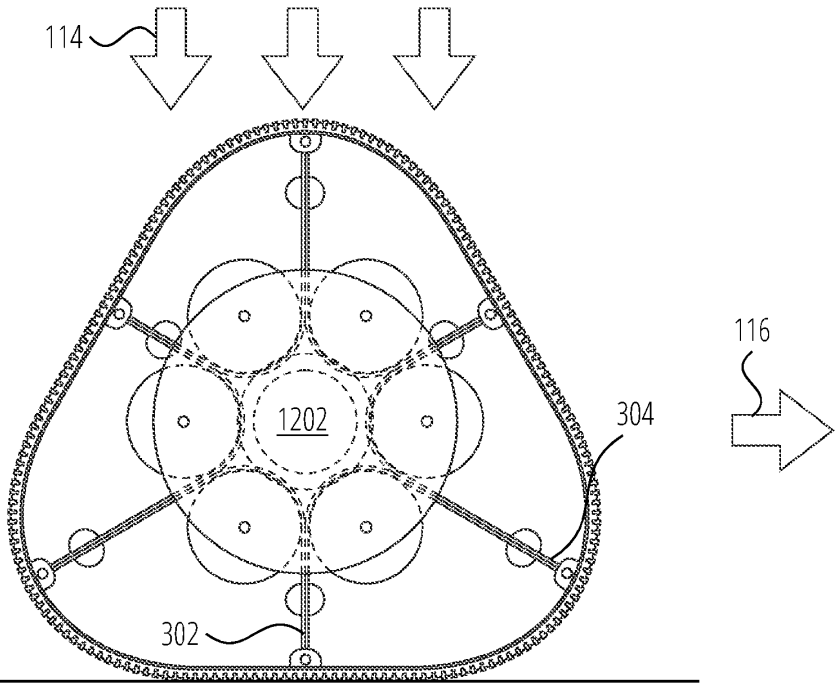


FIG. 12B

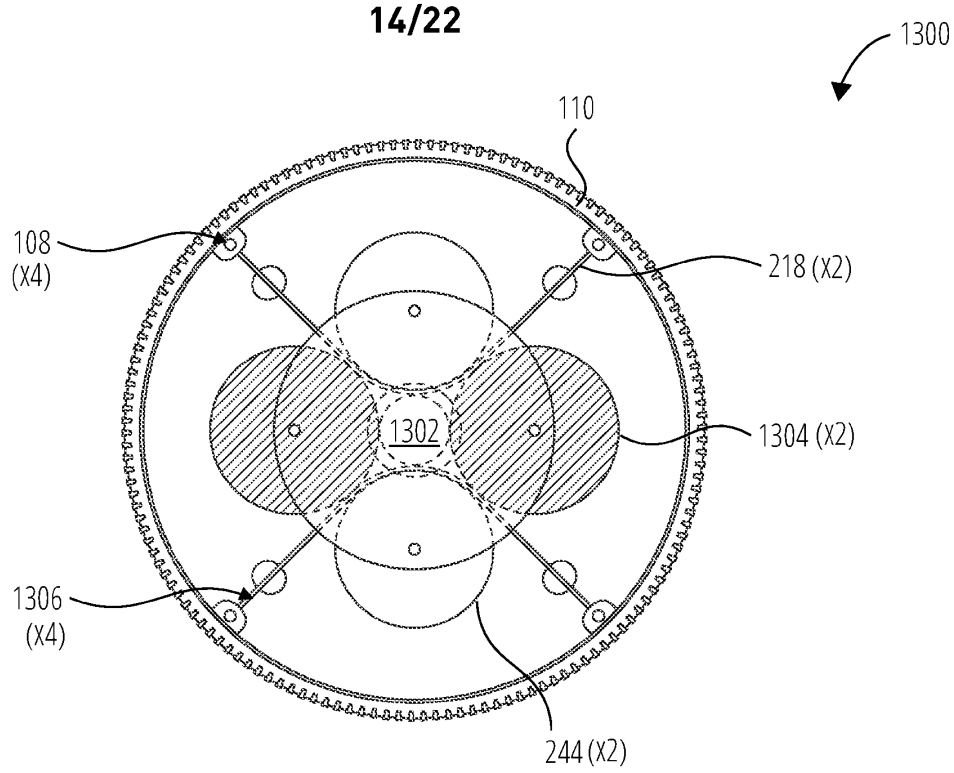

1300
110
108
(X4)
218 (X2)
1302
1304 (X2)
1306
(X4)
244 (X2)

FIG. 13

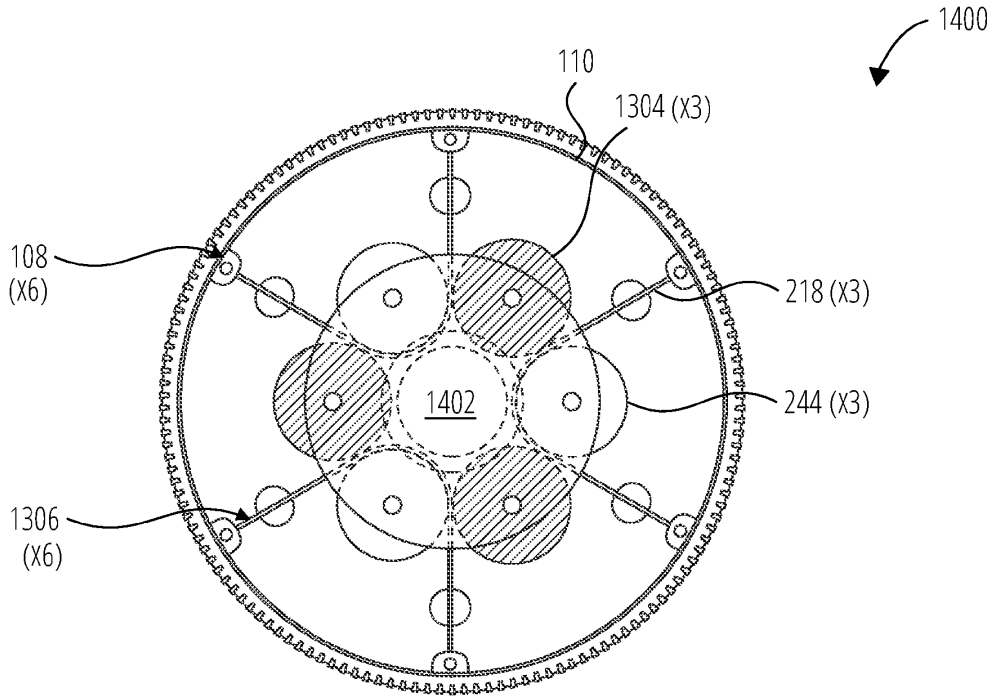

1400
110
1304 (X3)
108
(X6)
218 (X3)
1402
244 (X3)
1306
(X6)

FIG. 14

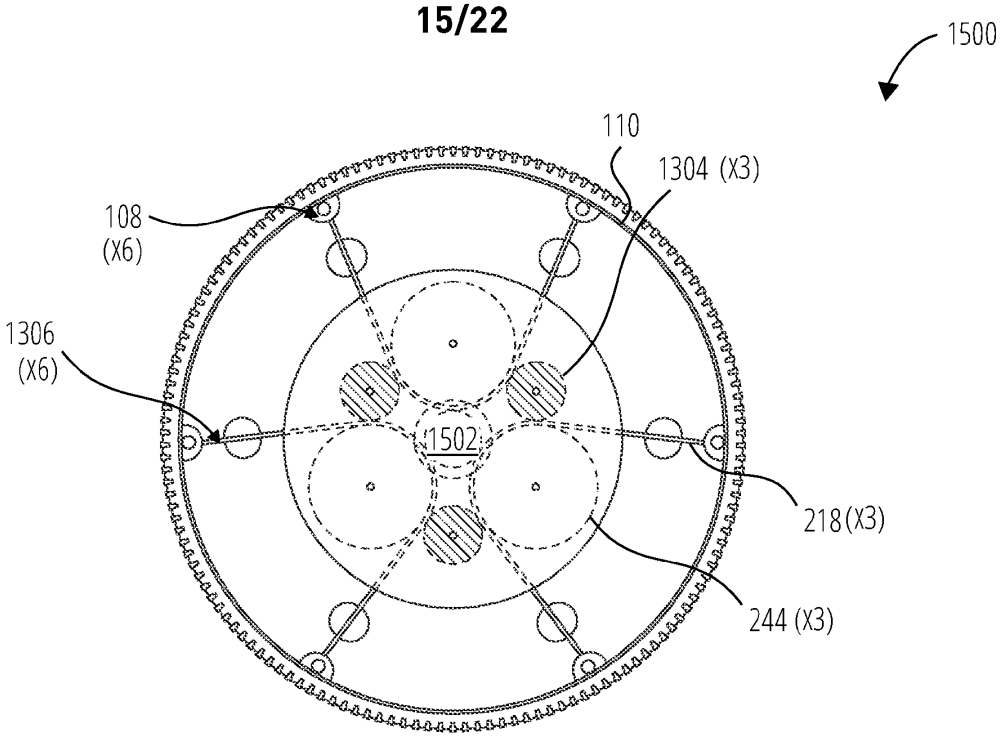

1500
110
1304 (X3)
108
(X6)
1306
(X6)
1502
218 (X3)
244 (X3)

FIG. 15

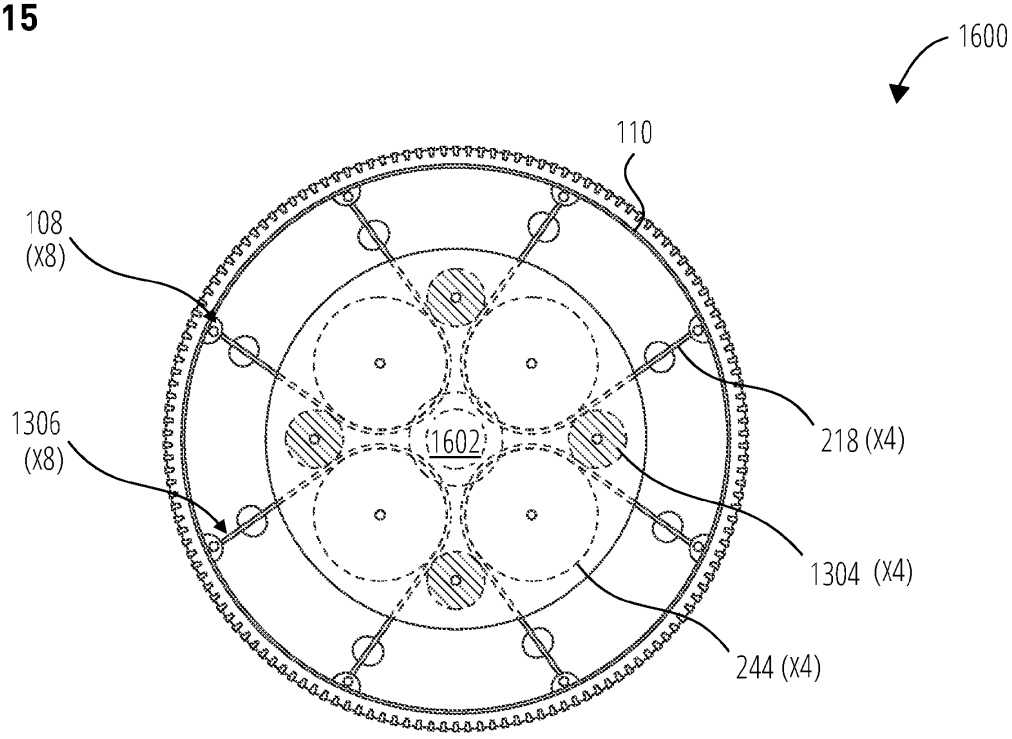

1600
110
108
(X8)
1306
(X8)
1602
218 (X4)
1304 (X4)
244 (X4)

FIG. 16

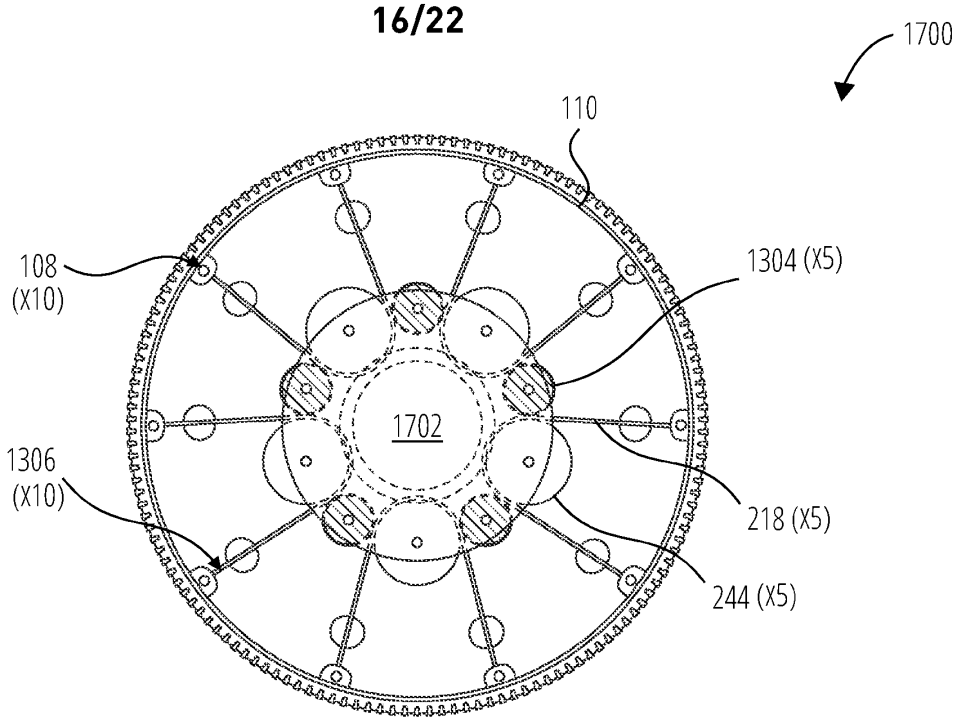

1700
110
108
(X10)
1304 (X5)
1702
1306
(X10)
218 (X5)
244 (X5)

FIG. 17

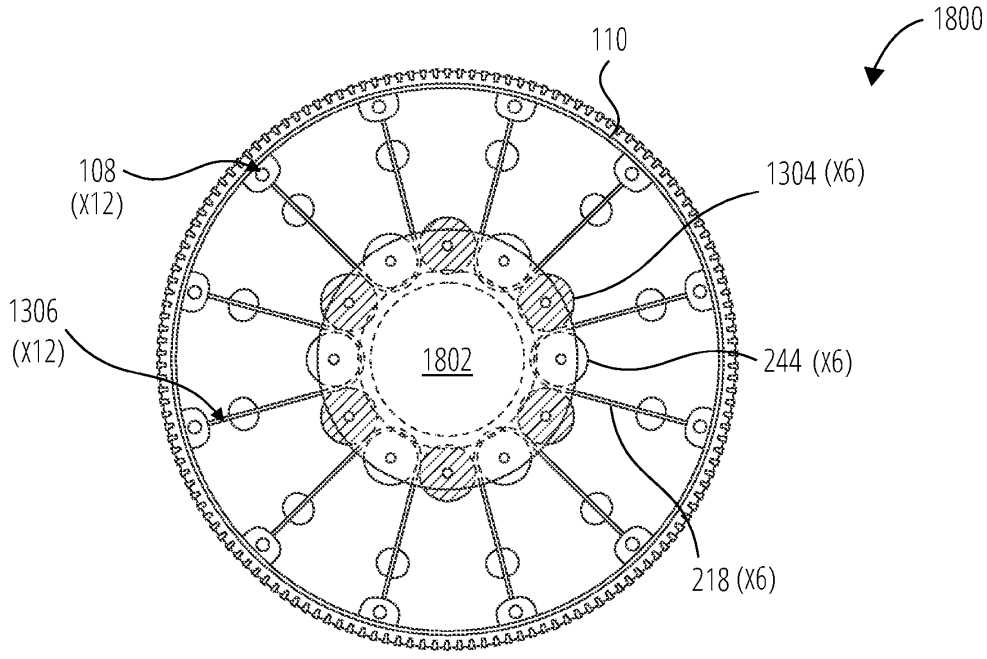

1800
110
108
(X12)
1304 (X6)
1306
(X12)
1802
244 (X6)
218 (X6)

FIG. 18

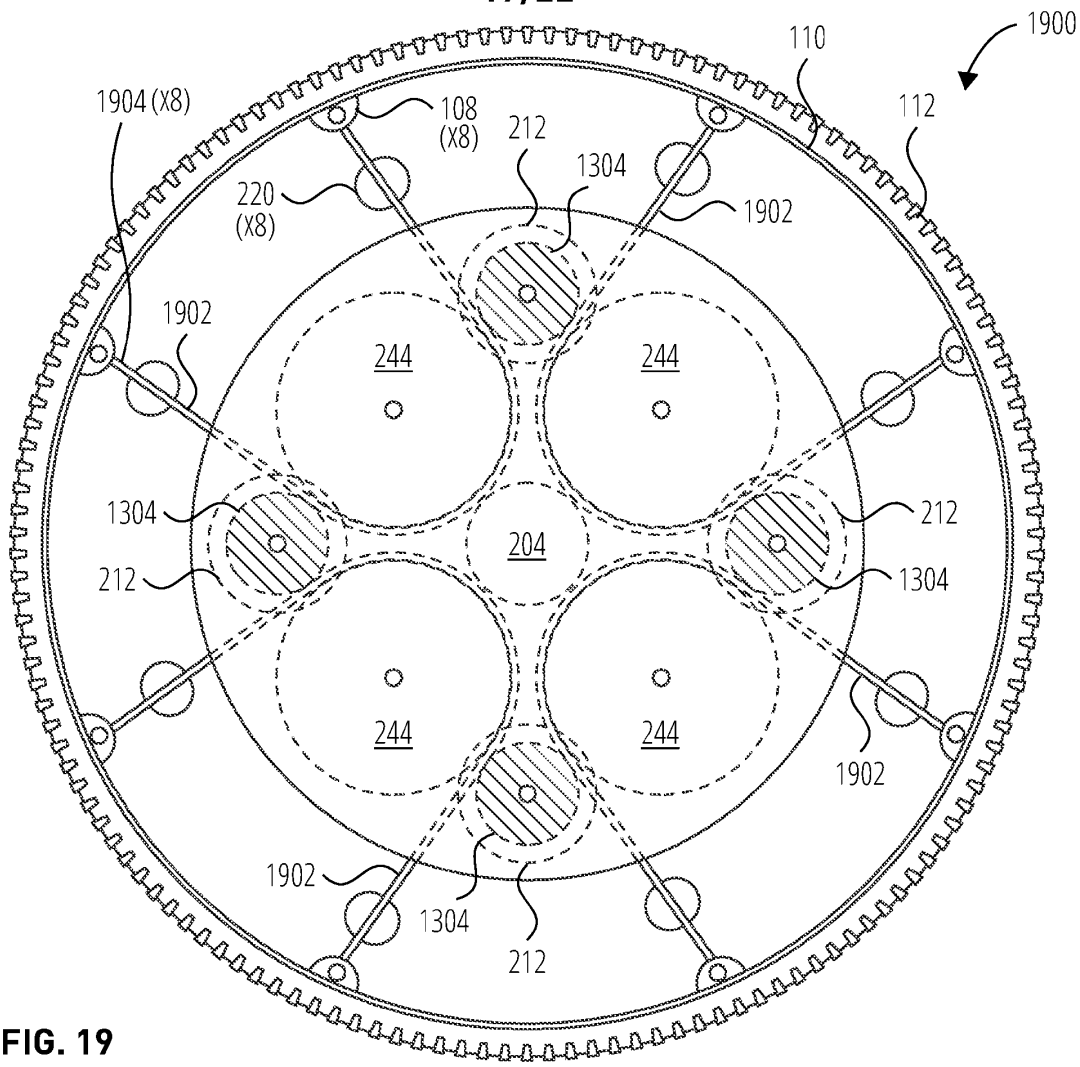

1900
110
112
1904 (X8)
108
(X8)
212
1304
220
(X8)
1902
1902
244
244
1304
212
204
212
1304
244
244
1902
1902
1304
212

FIG. 19

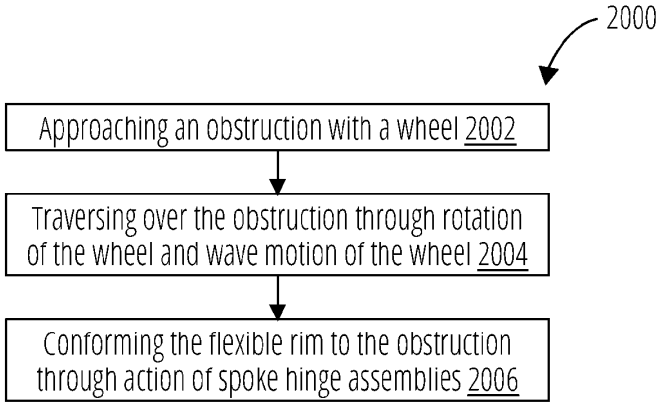

2000
Approaching an obstruction with a wheel 2002
Traversing over the obstruction through rotation of the wheel and wave motion of the wheel 2004
Conforming the flexible rim to the obstruction through action of spoke hinge assemblies 2006

FIG. 20

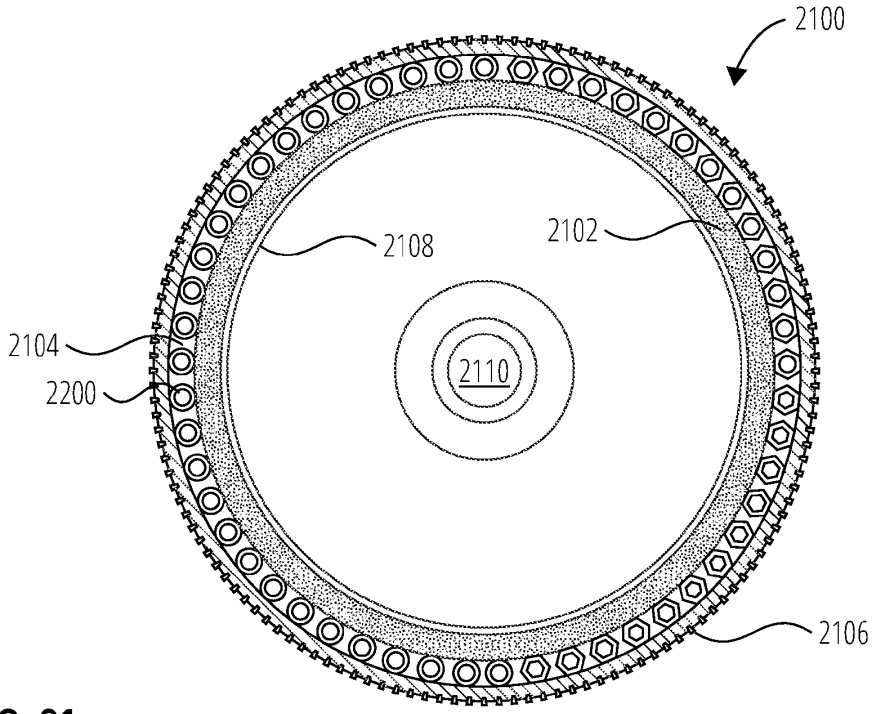


FIG. 21

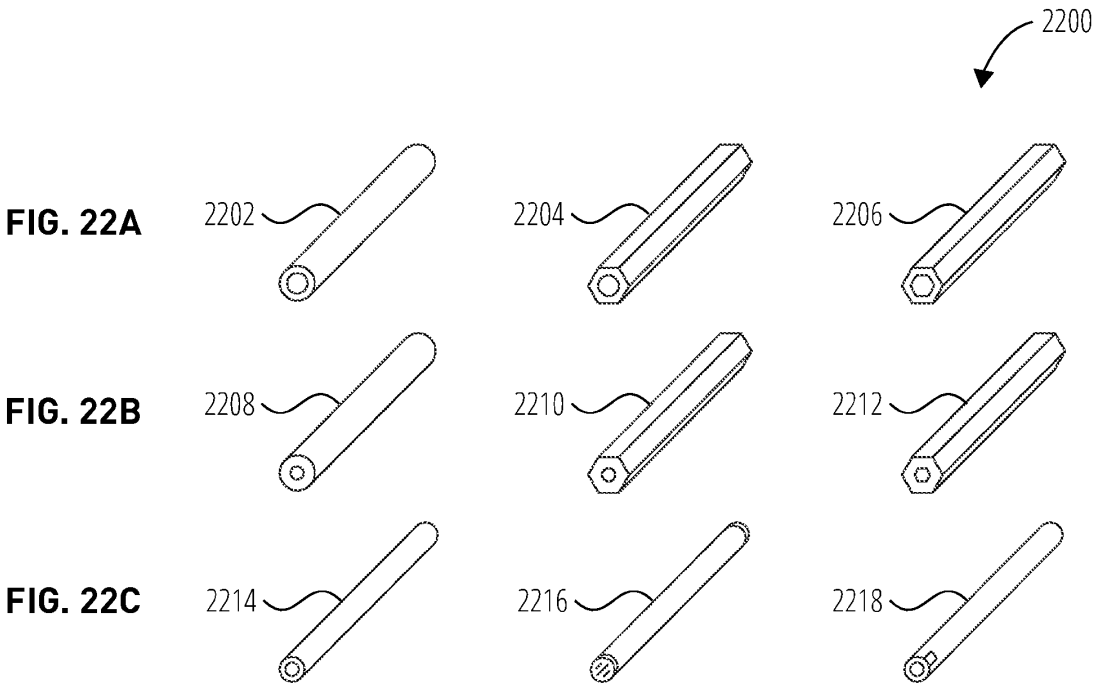


FIG. 22A

FIG. 22B

FIG. 22C

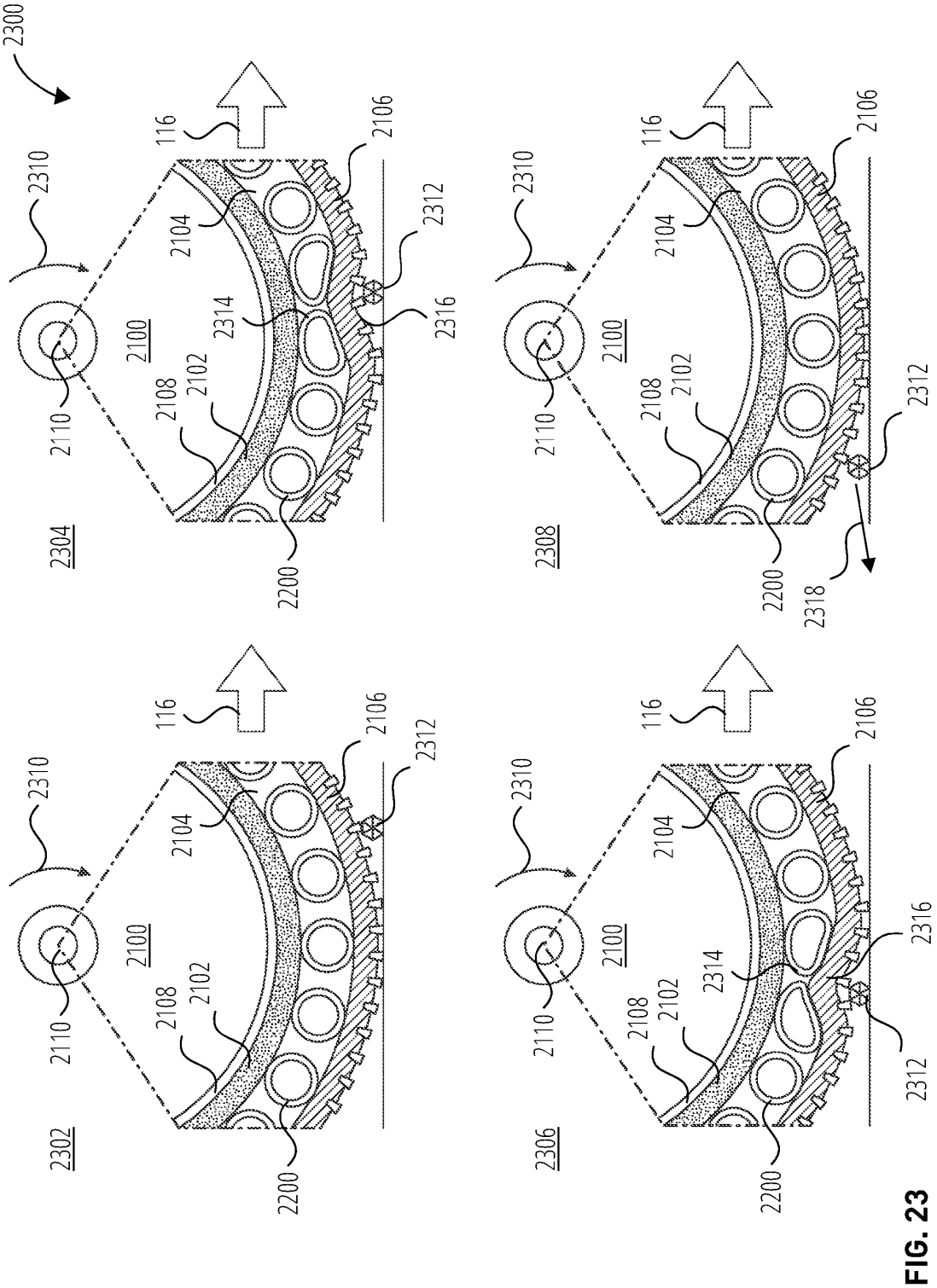

2300
2310
2110
2100
2102
2104
2106
2108
2200
2302
2304
2306
2308
2312
2314
2316
2318
116

FIG. 23

FIG. 24A

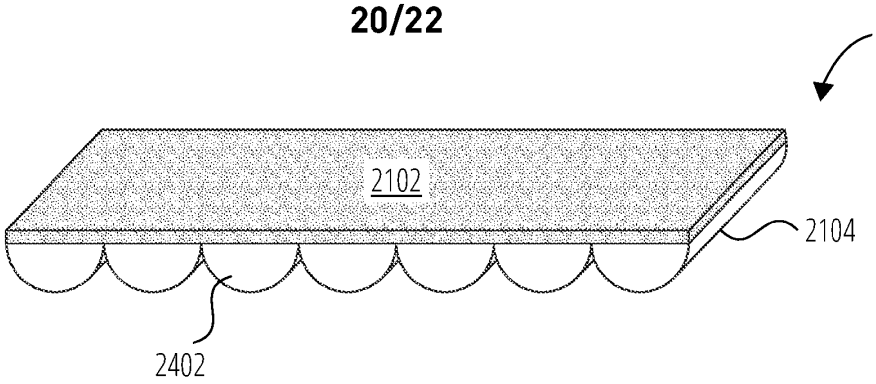


FIG. 24B

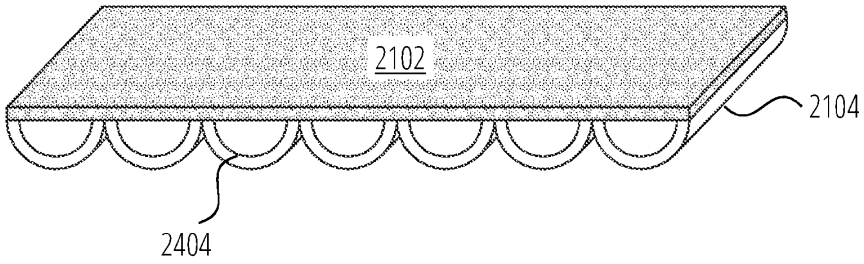


FIG. 24C

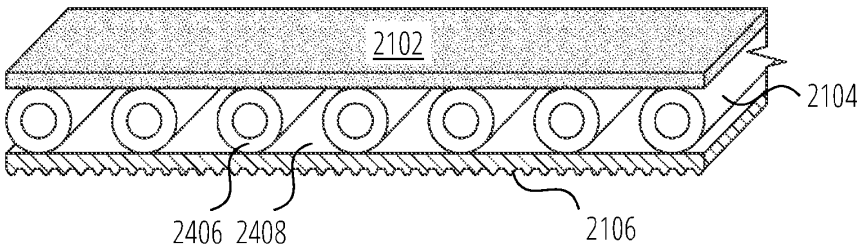


FIG. 24D

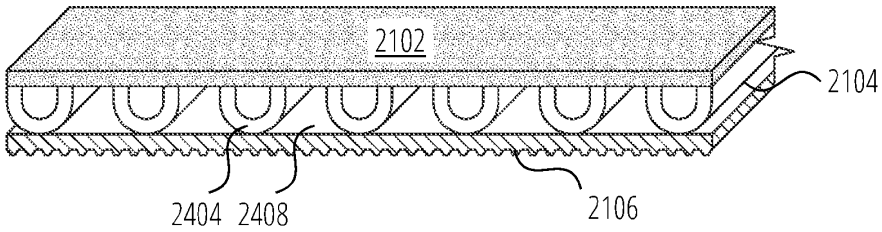
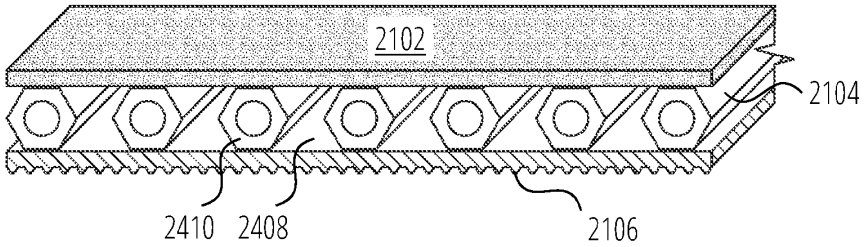


FIG. 24E



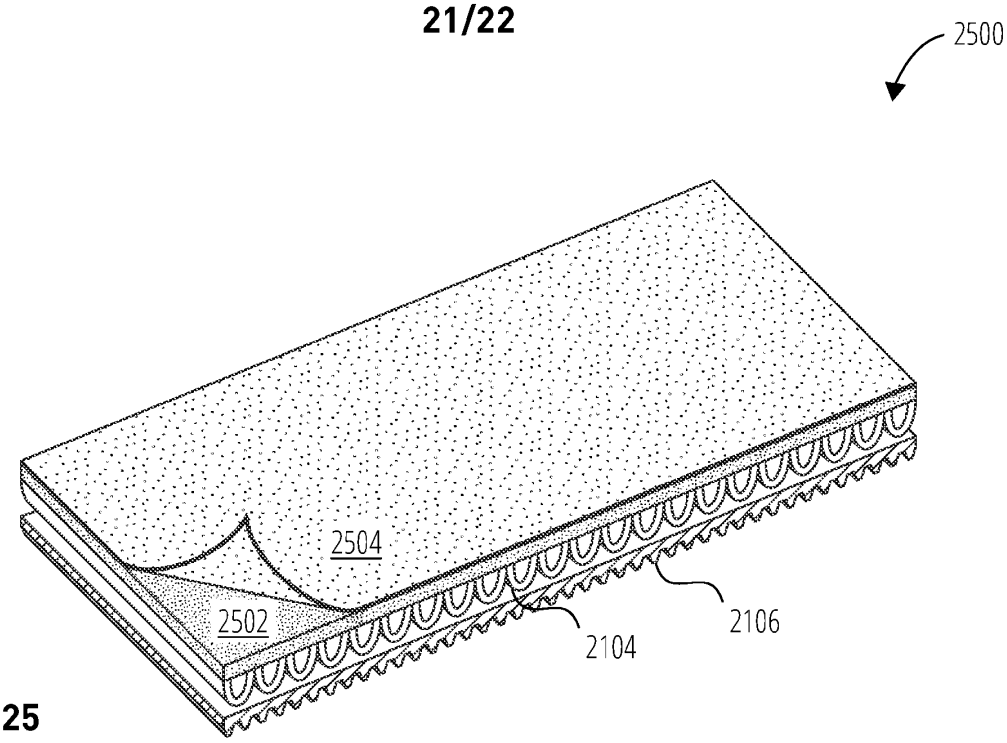

2500
2504
2502
2104
2106

FIG. 25

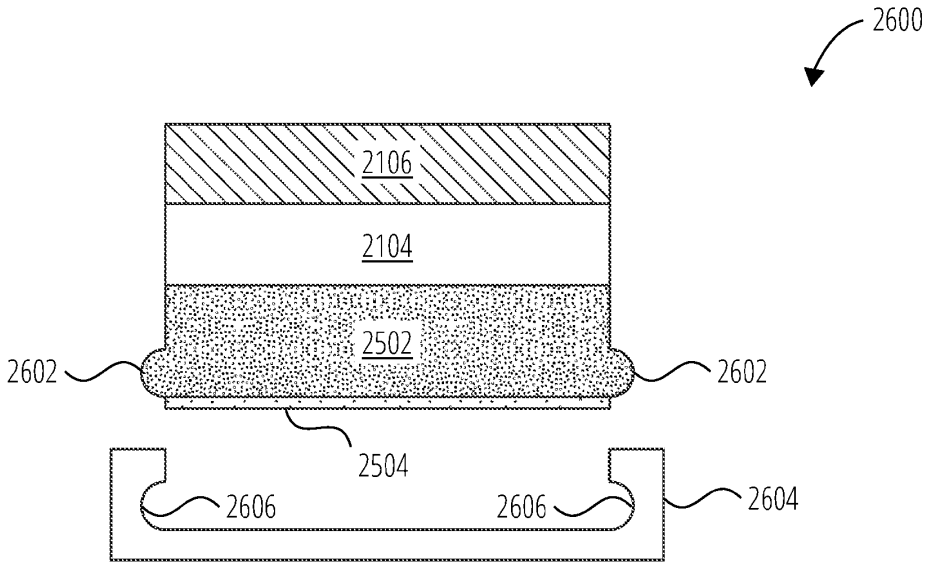

2600
2106
2104
2502
2602
2602
2504
2606
2606
2604

FIG. 26

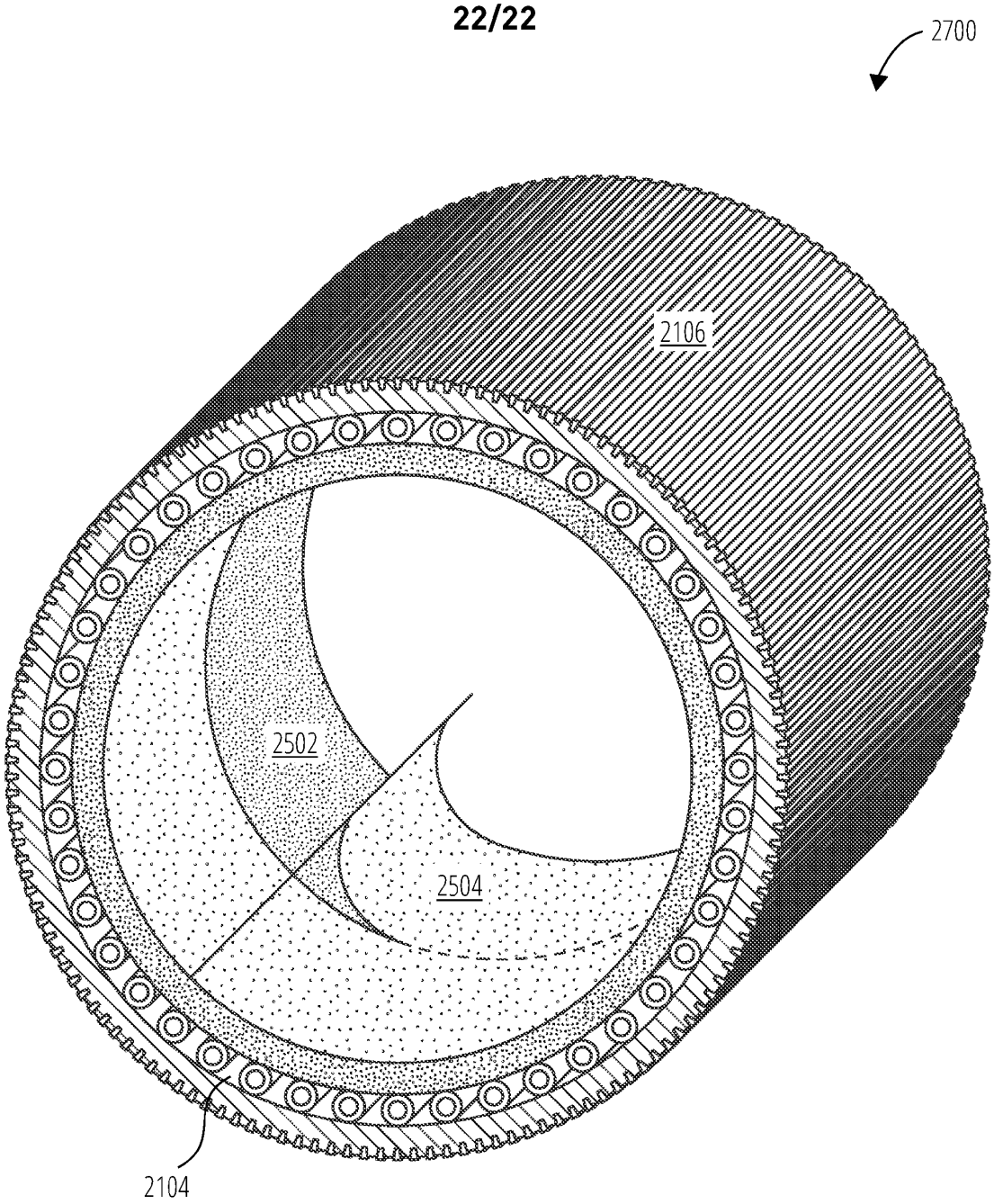


FIG. 27