FIG. 1

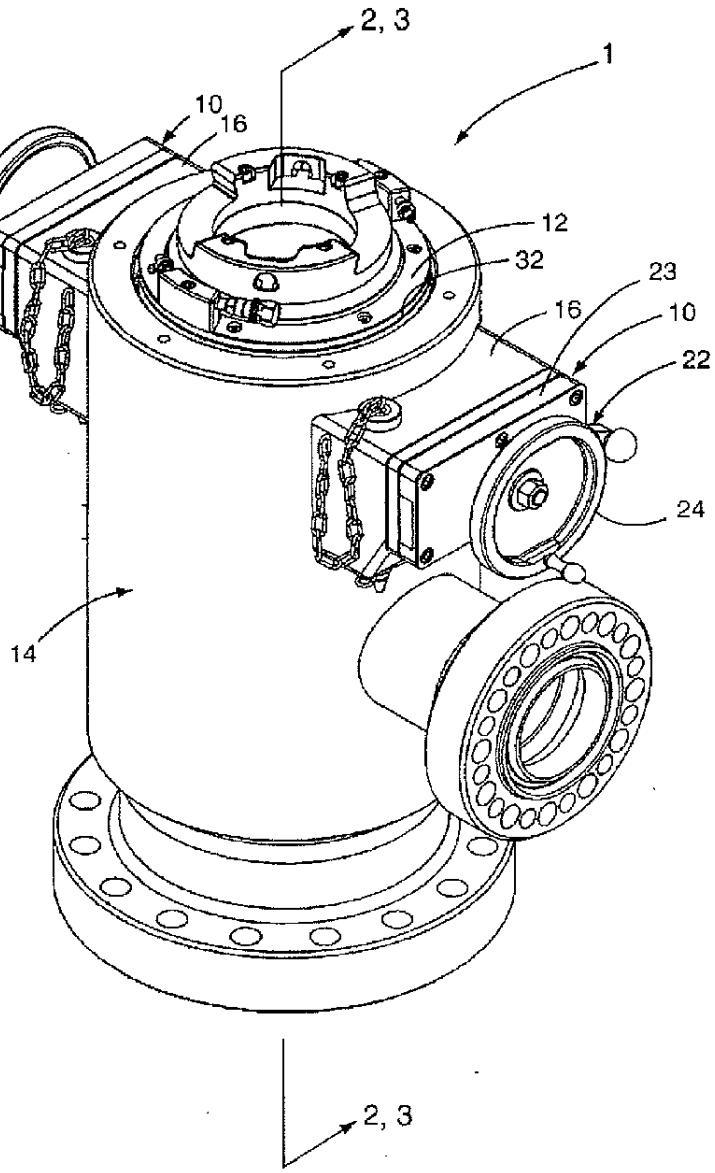


FIG. 2

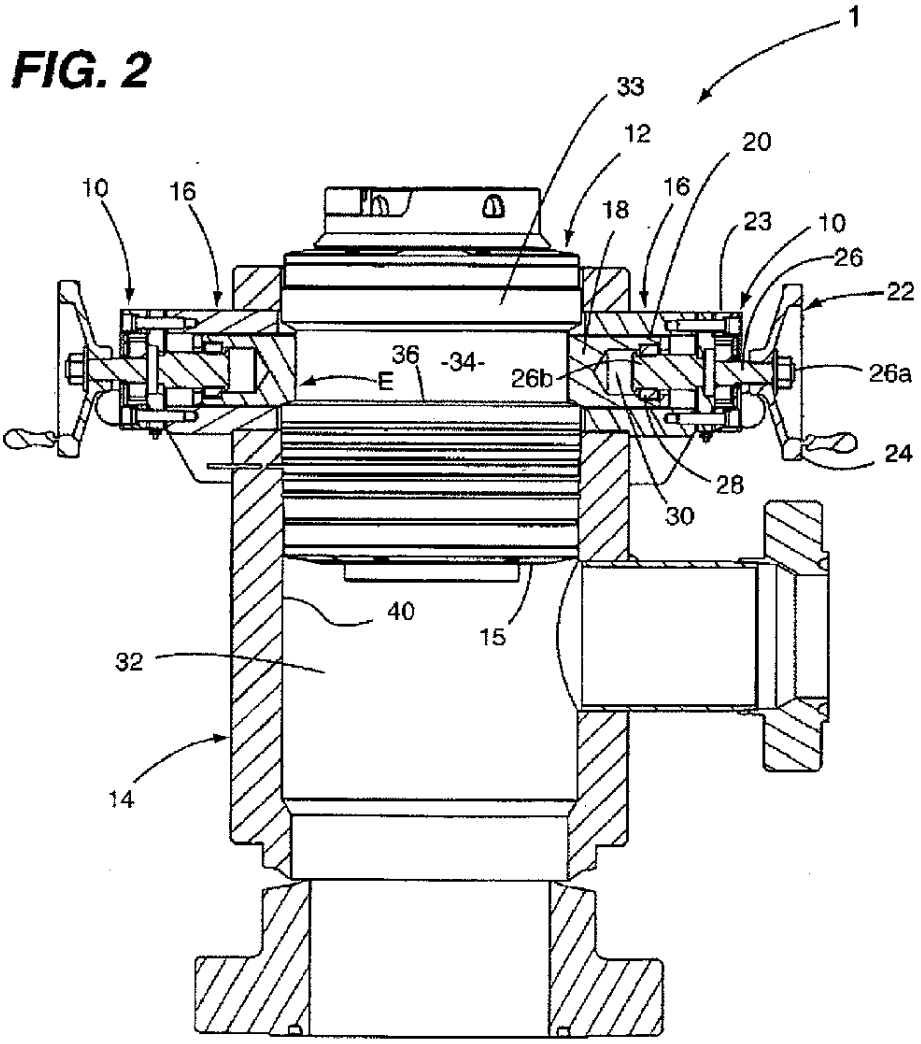


FIG. 3

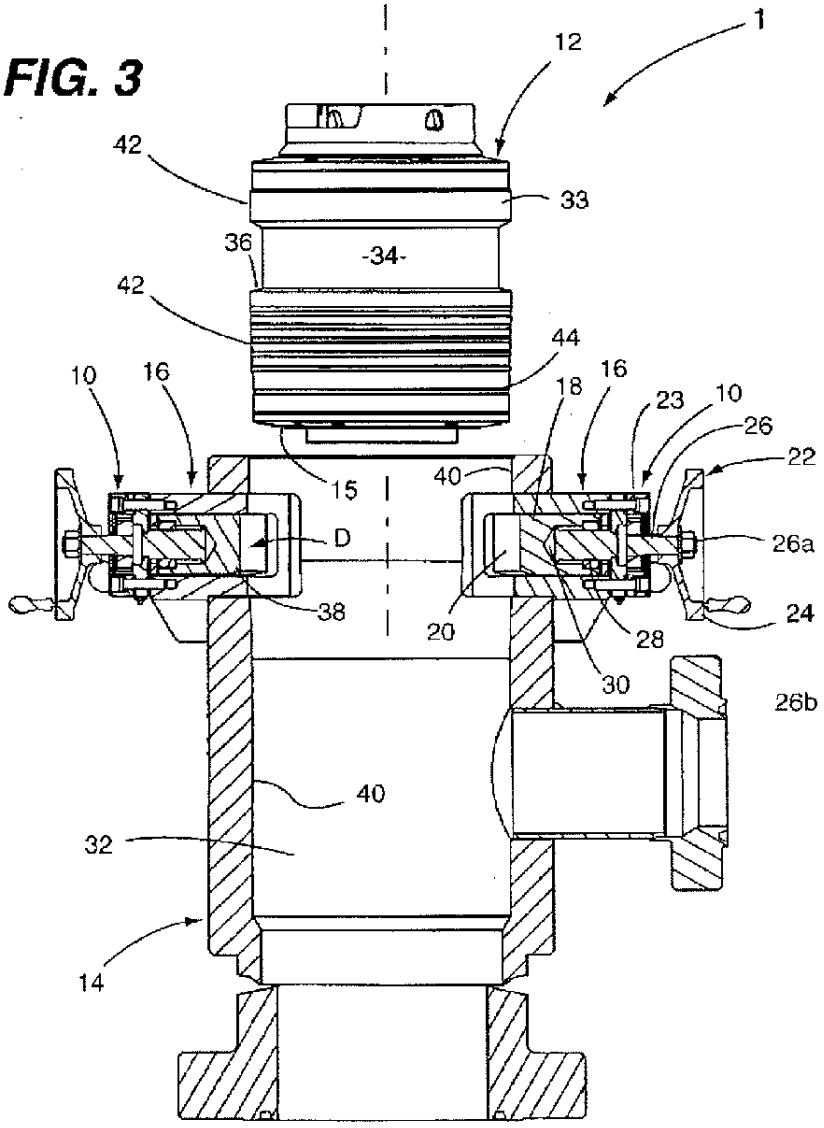
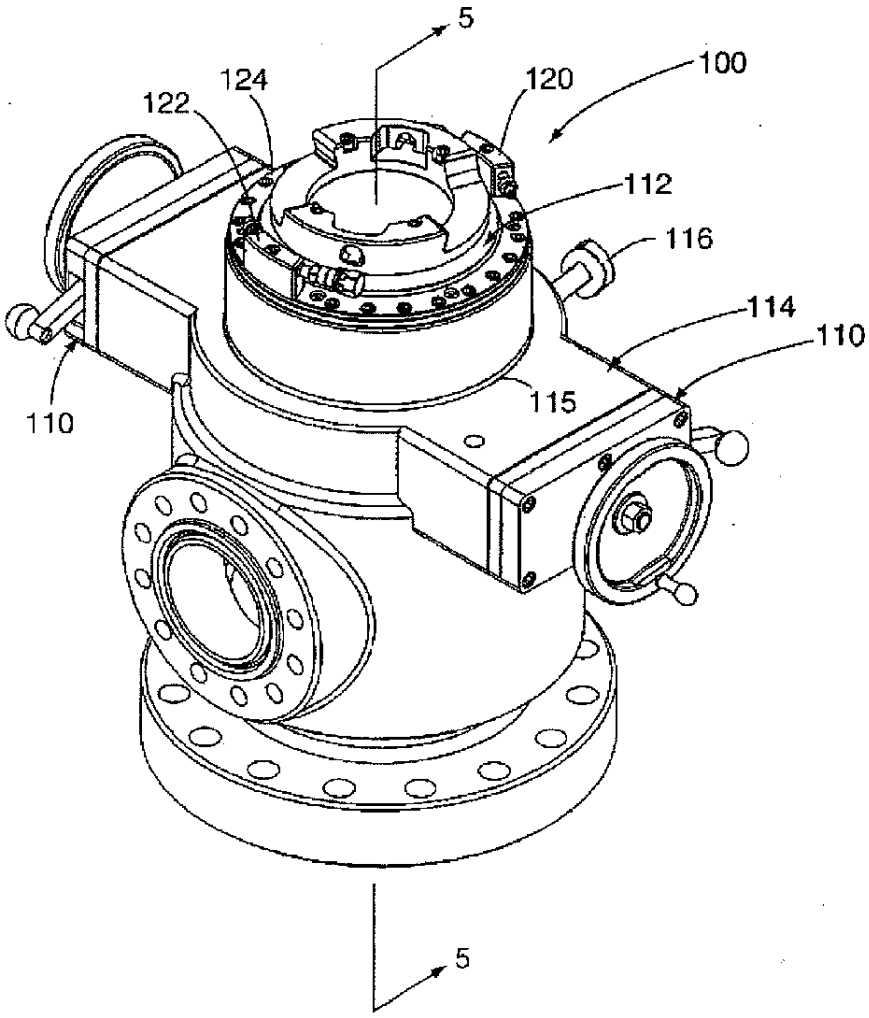

1
12
42
33
36
-34-
42
44
10
16
18
16
23
10
26
22
15
40
D
26a
38
20
28
24
30
26b
40
32
14

FIG. 4



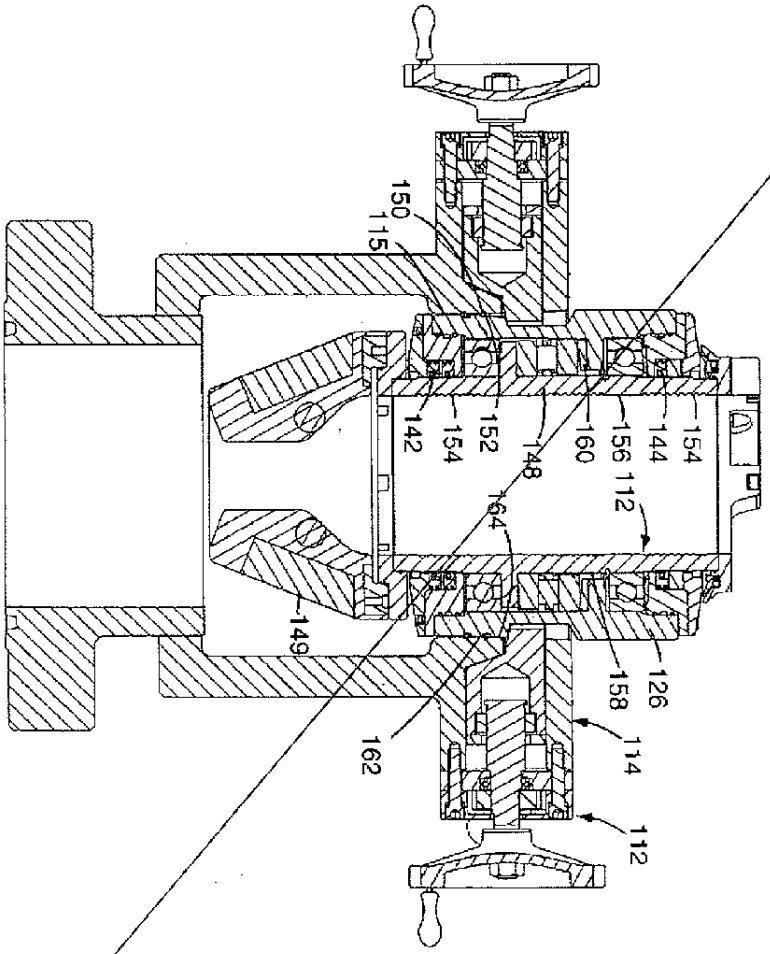

150
115
142
154
152
148
160
156
112
144
154
164
149
158
126
162
114
112
100

FIG. 5

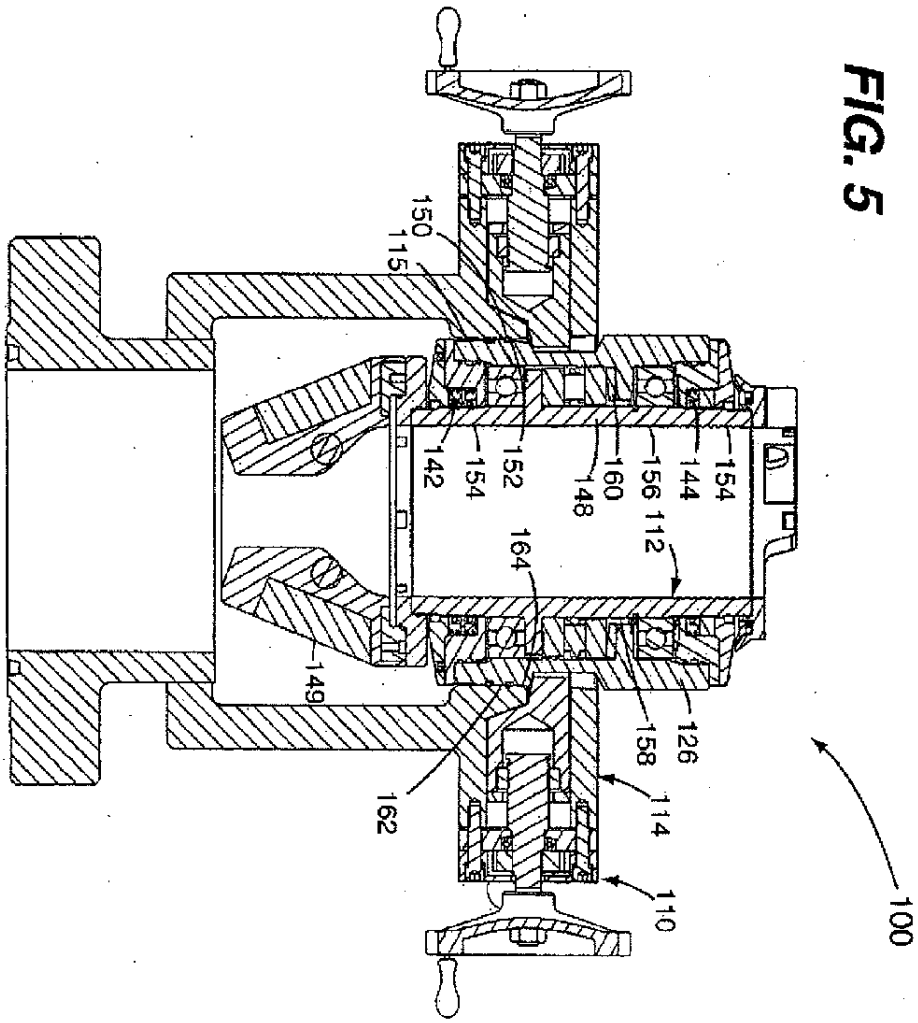

150
115
142
154
152
148
160
156
112
144
154
164
149
158
126
162
114
110
100

FIG. 5

FIG. 6

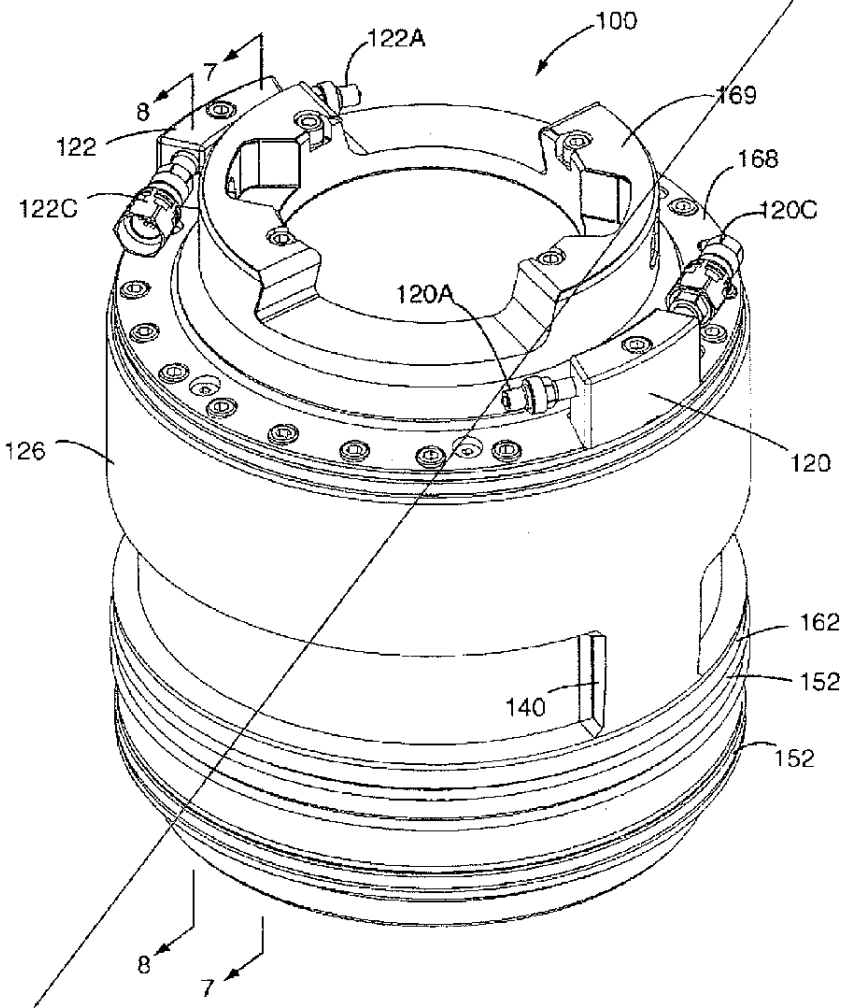

100
122A
7
8
122
122C
169
168
120C
120A
126
120
162
152
140
152
8
7

FIG. 6

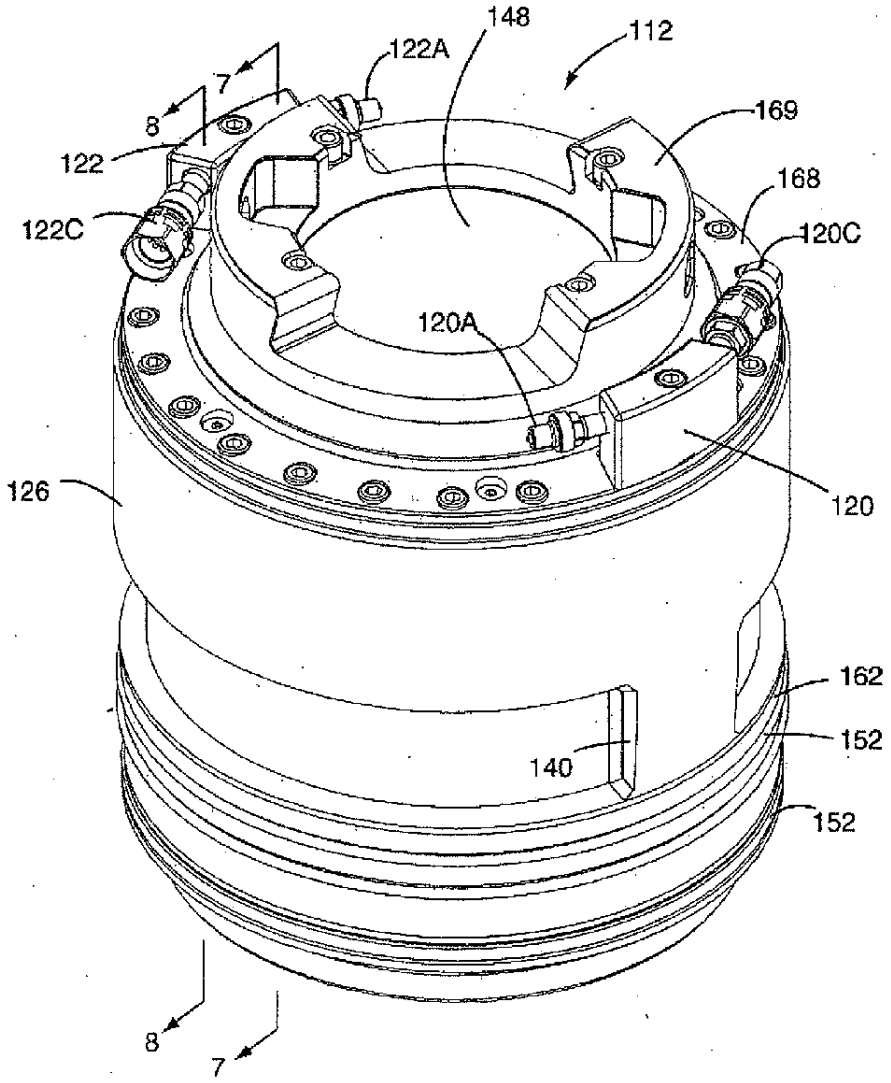
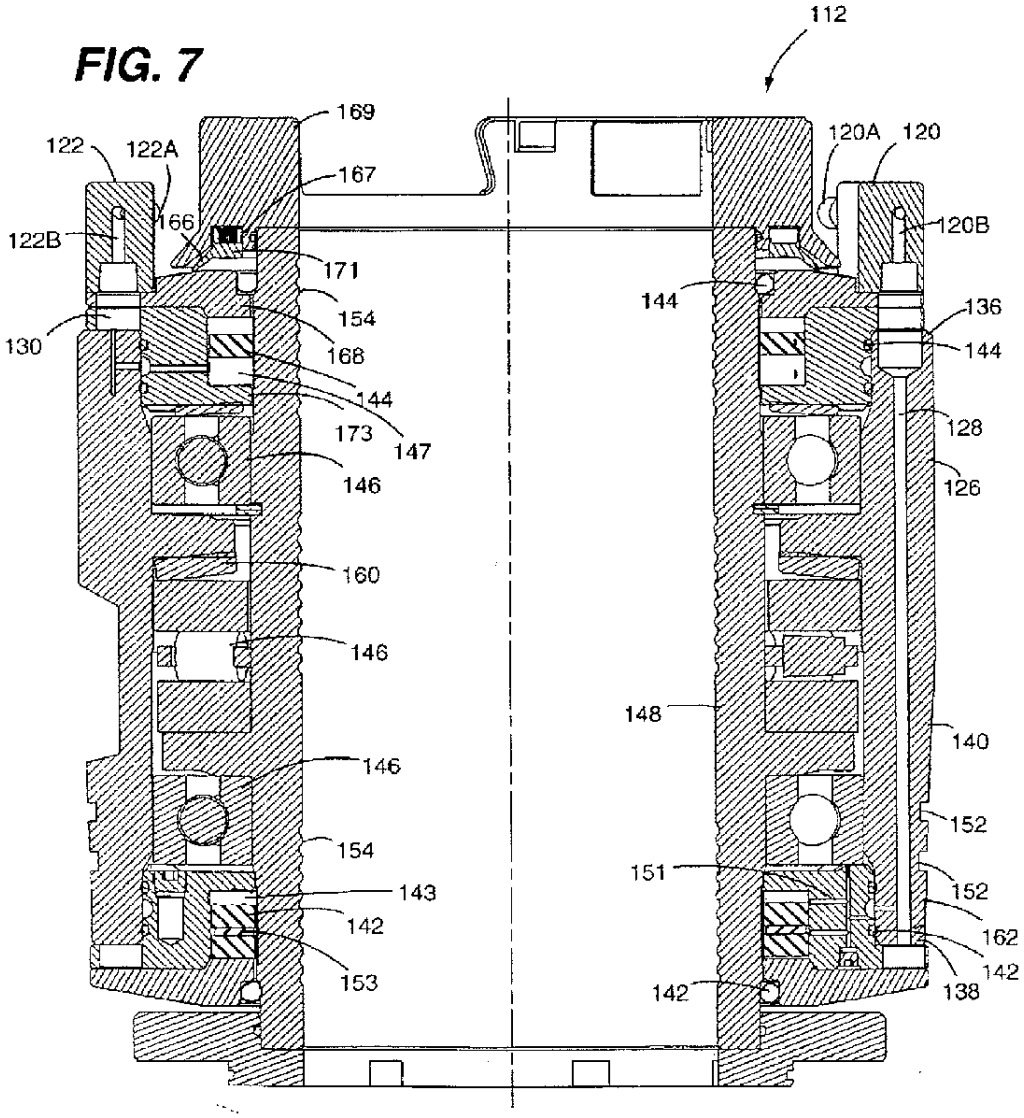

148
112
122A
7
8
169
122
168
122C
120C
120A
126
120
162
152
140
152
8
7

FIG. 7


112
169
122
122A
167
166
122B
171
154
130
168
144
173
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146
160
146
146
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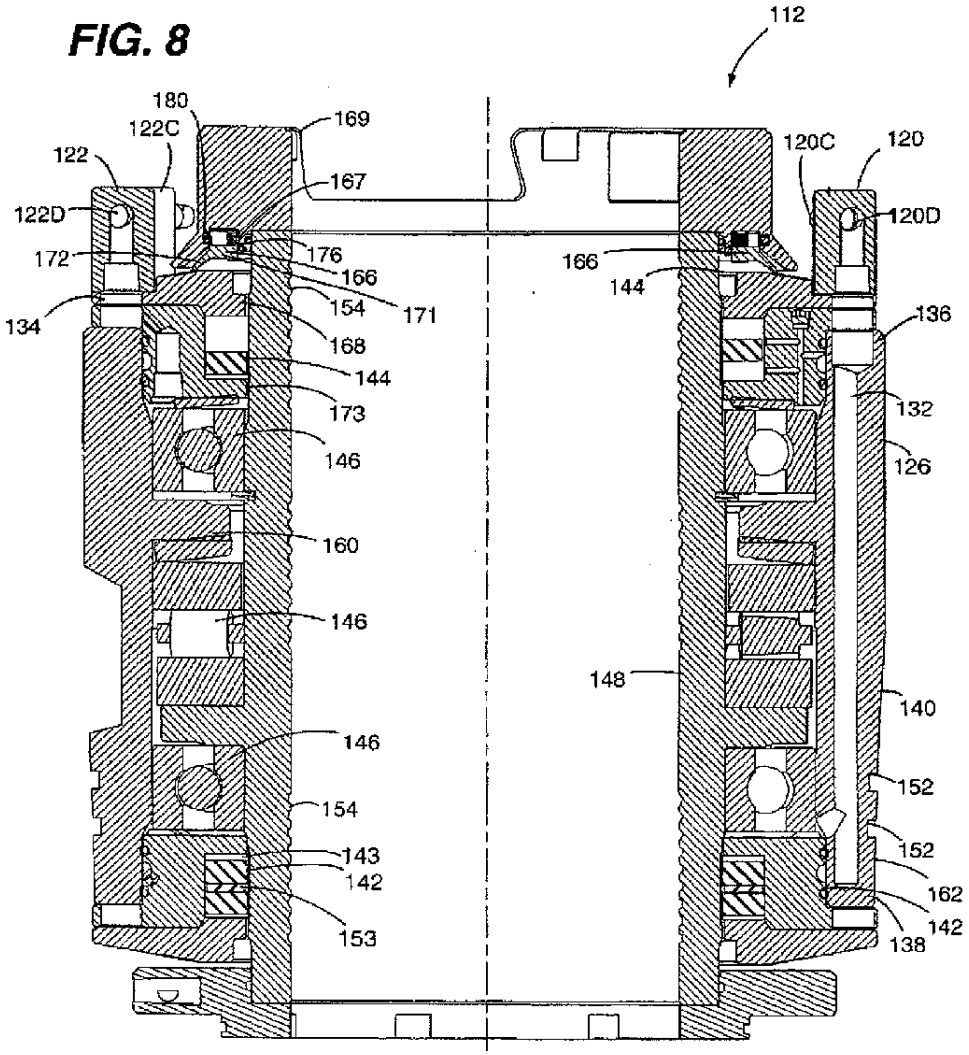
143
142
153
120A
120
120B
144
136
144
128
126
148
140
152
151
152
162
142
142
138

FIG. 8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122C
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122
167
120C
120
122D
120D
172
176
166
166
144
154
171
136
134
168
144
132
173
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152
154
143
152
142
162
153
142
138

FIG. 9

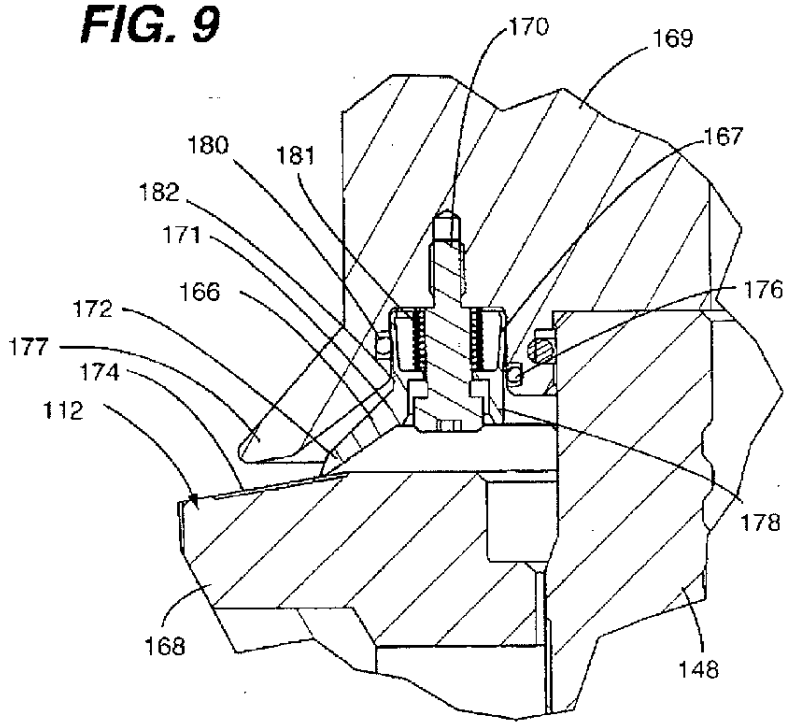


FIG. 10

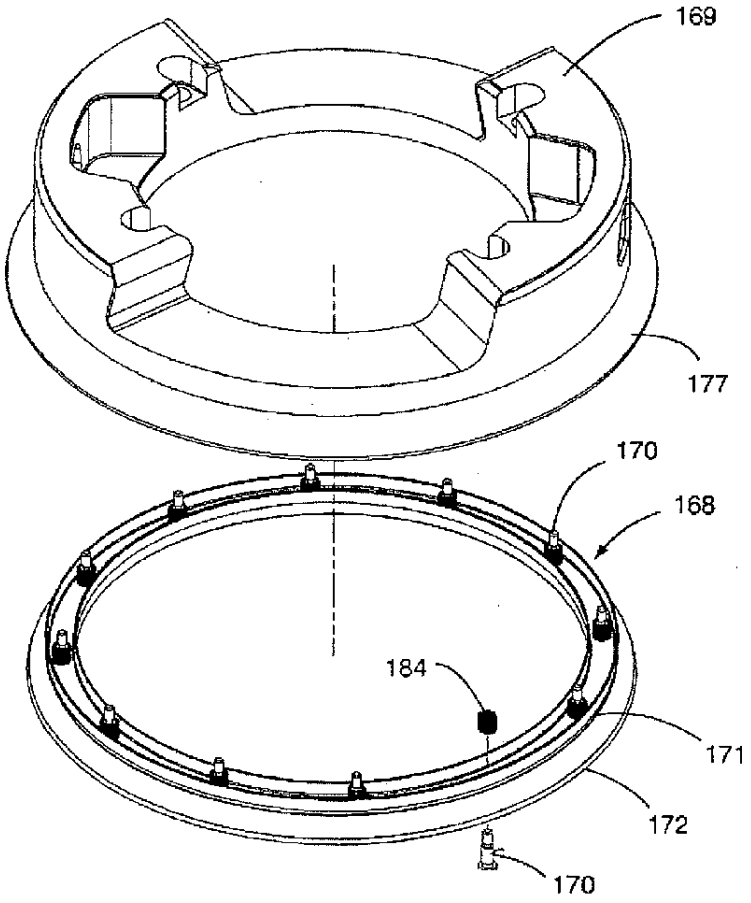


FIG. 11

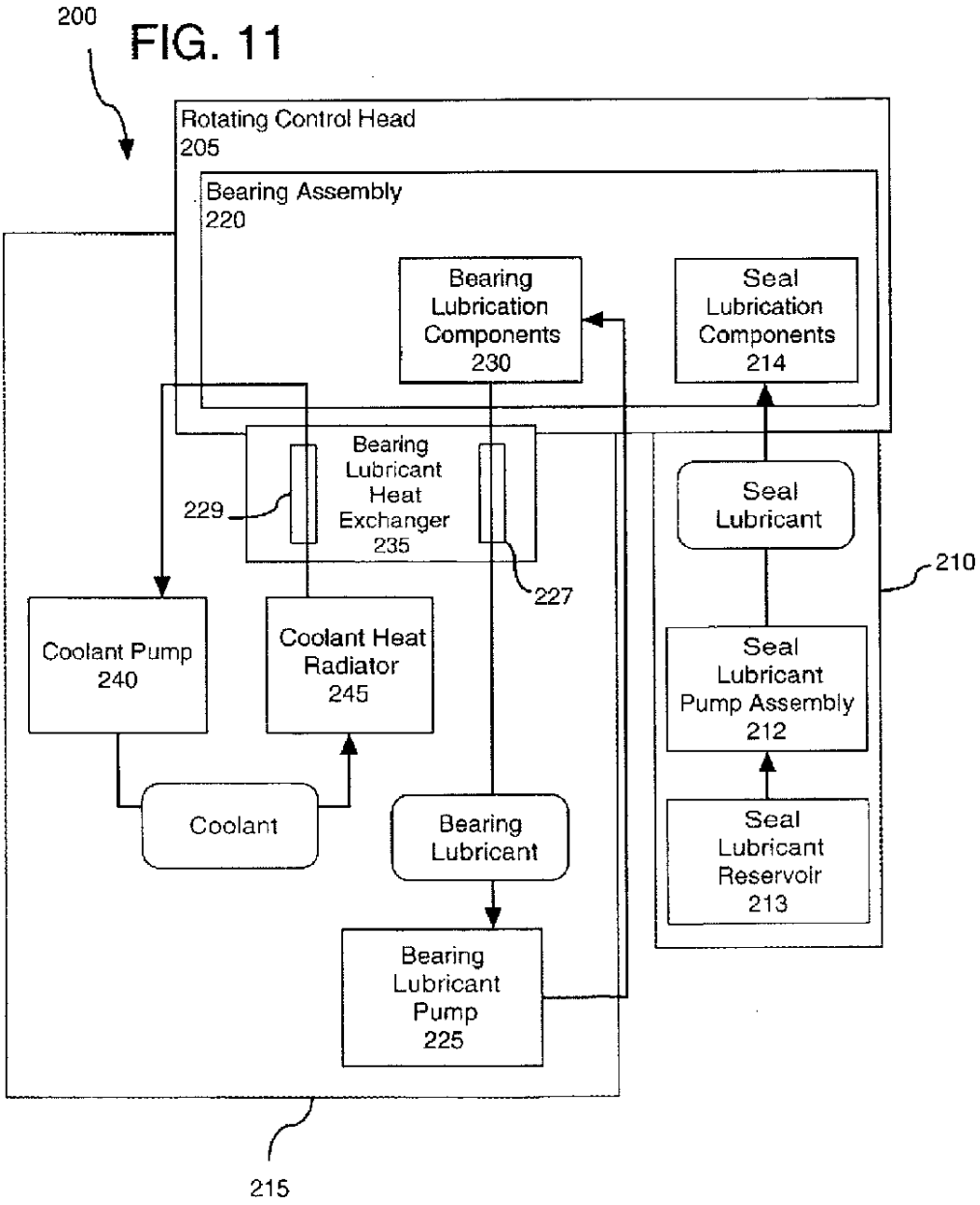

200
Rotating Control Head
205
Bearing Assembly
220
Bearing Lubrication Components
230
Seal Lubrication Components
214
Bearing Lubricant Heat Exchanger
235
229
227
Seal Lubricant
210
Coolant Pump
240
Coolant Heat Radiator
245
Seal Lubricant Pump Assembly
212
Coolant
Bearing Lubricant
Seal Lubricant Reservoir
213
Bearing Lubricant Pump
225
215

FIG. 12

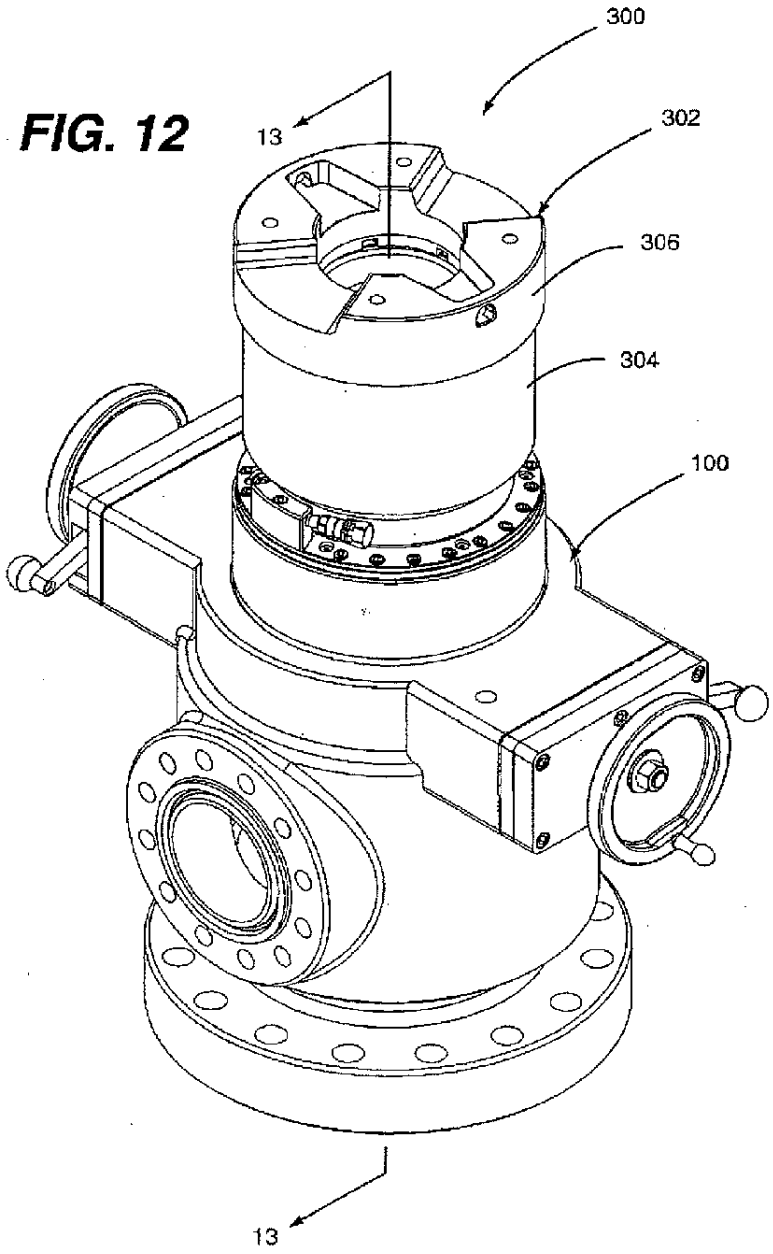


FIG. 13

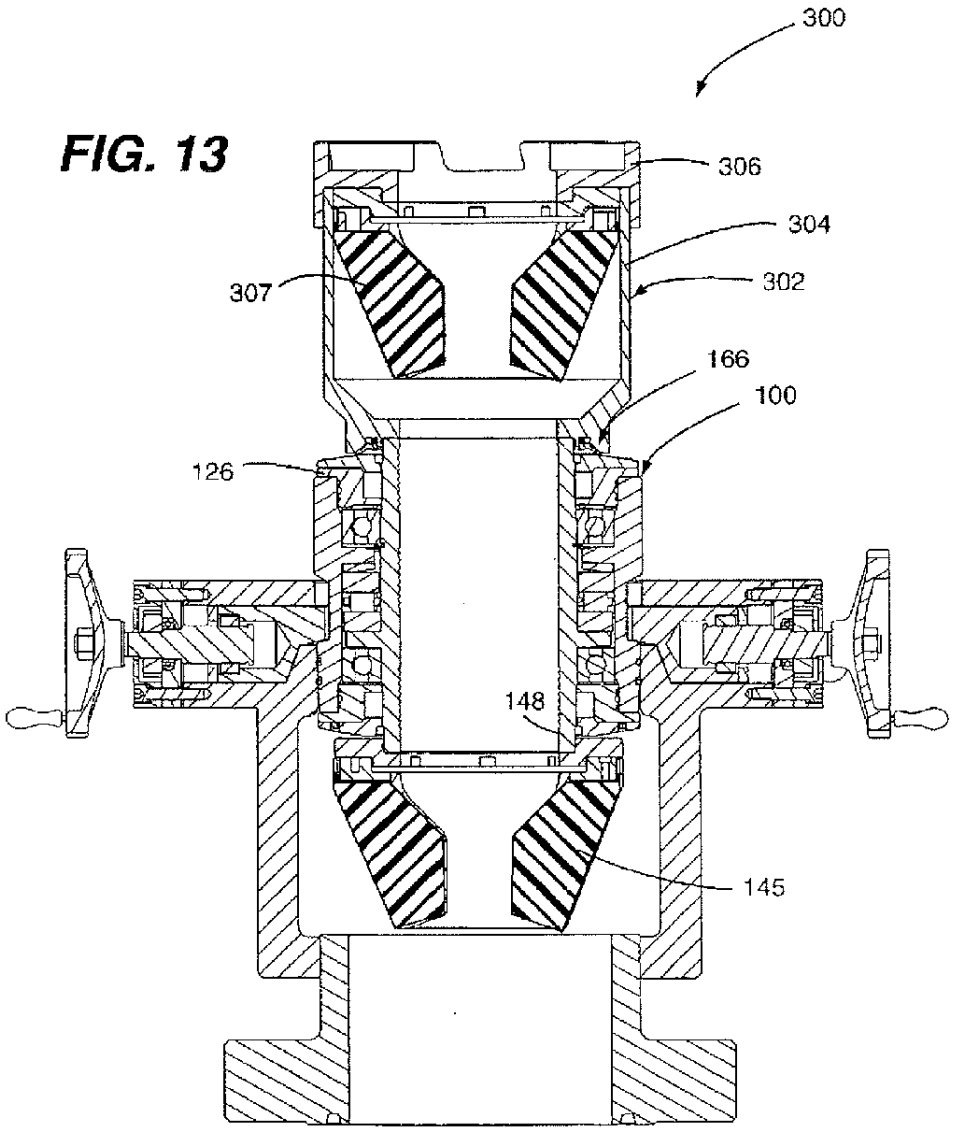


FIG. 14

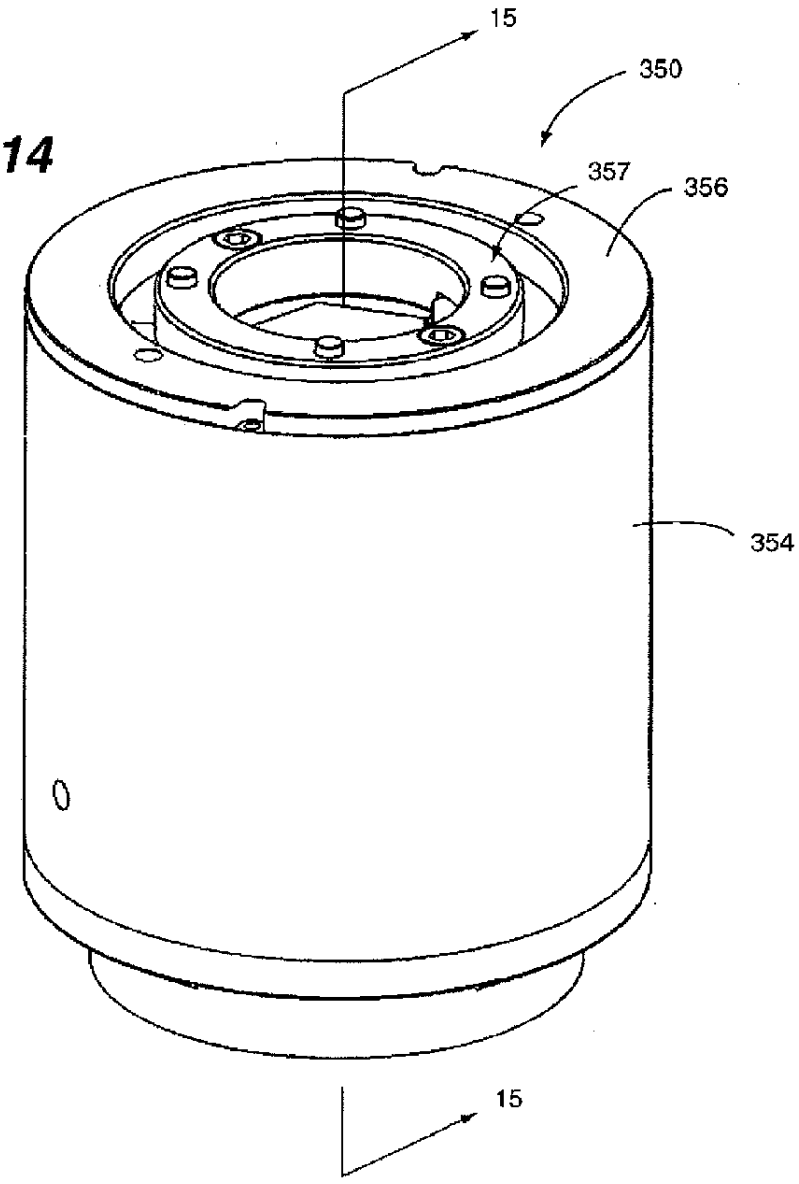


FIG. 15

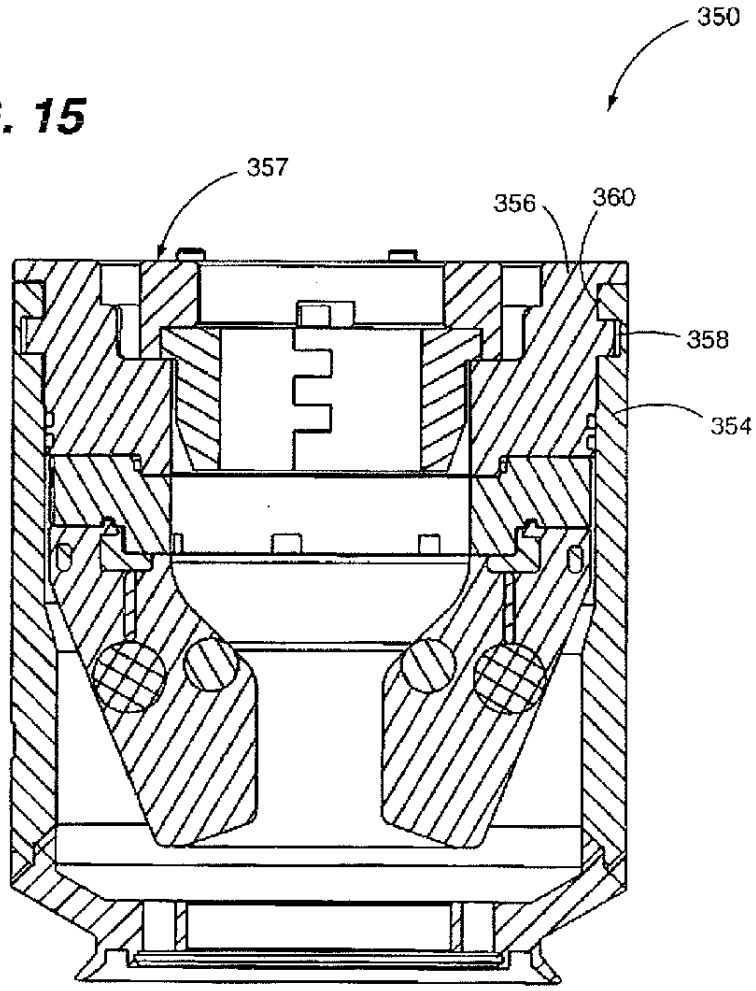
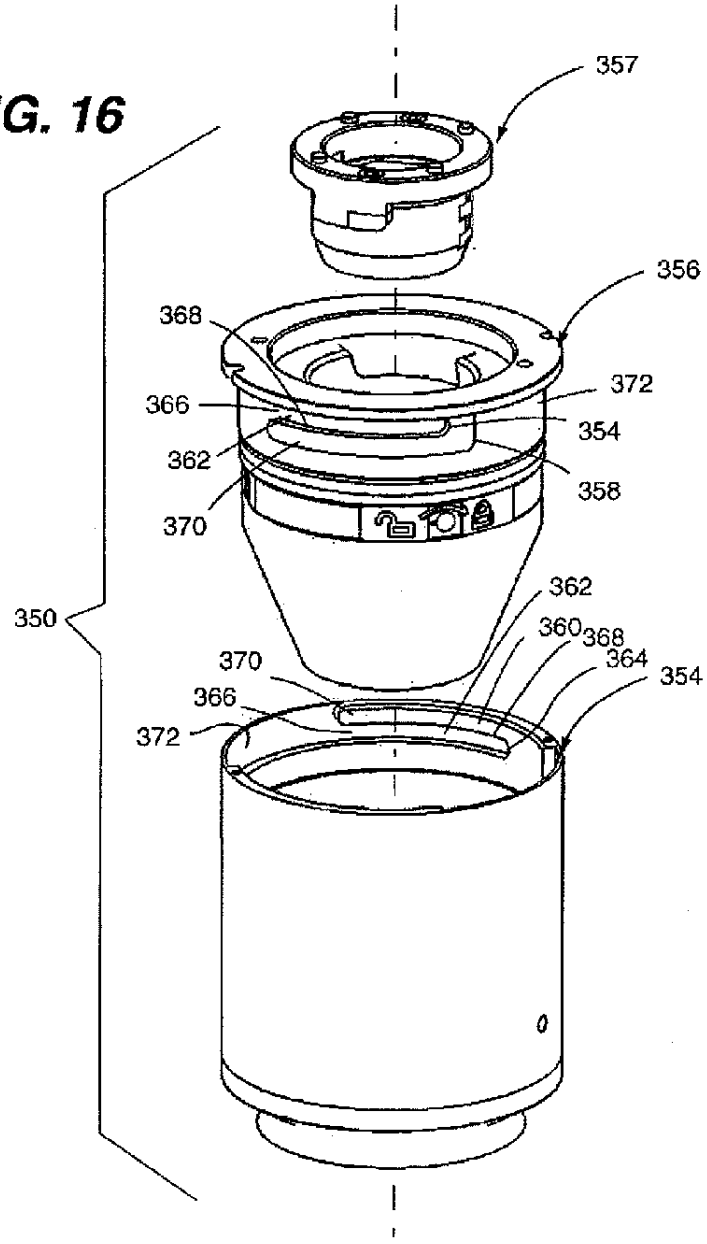


FIG. 16


357
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366
372

FIG. 17

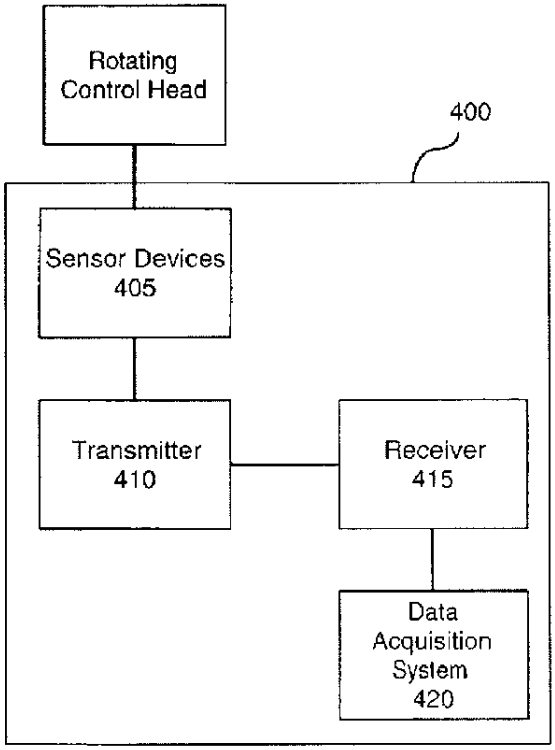
Rotating Control Head
400
Sensor Devices 405
Transmitter 410
Receiver 415
Data Acquisition System 420

FIG. 18

