FIG. 1A

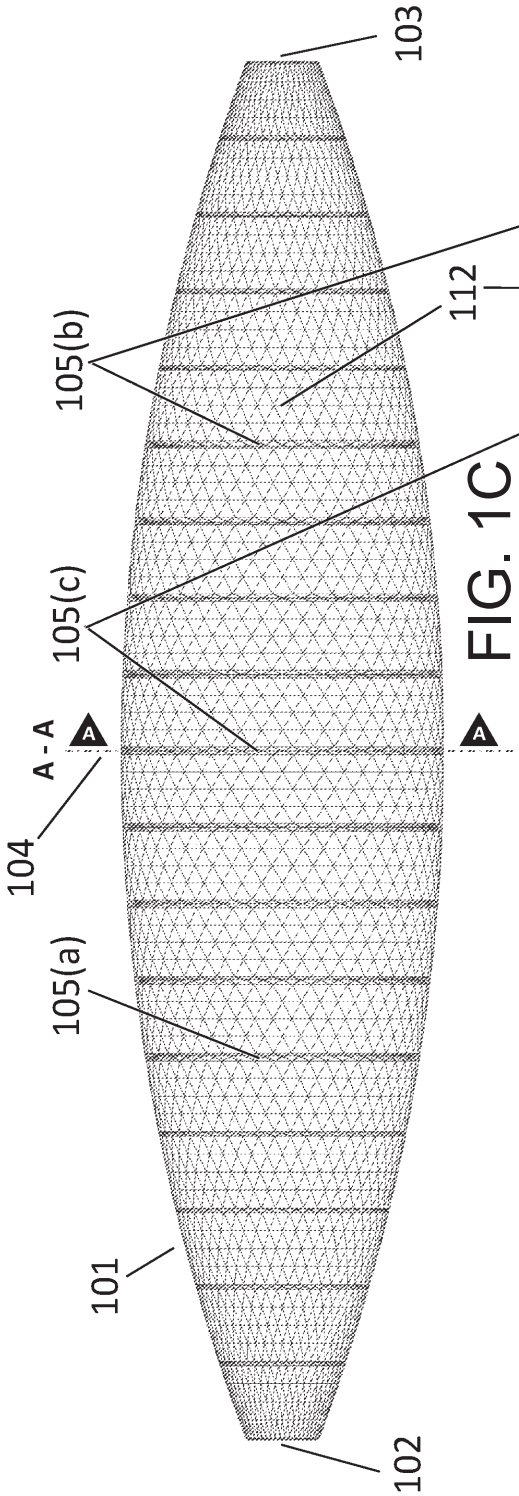


FIG. 1C

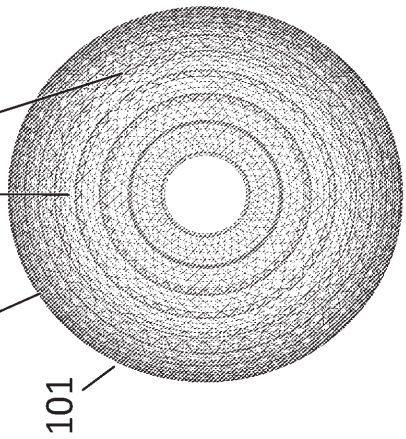
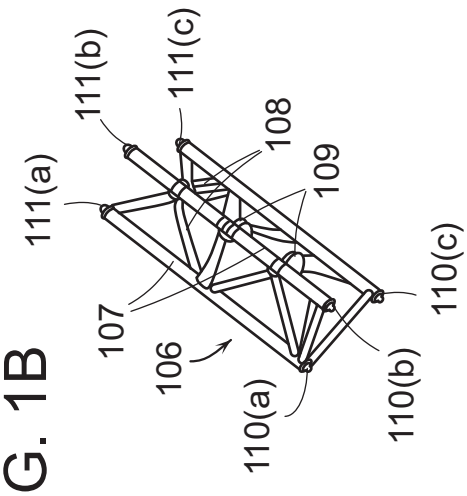


FIG. 1B



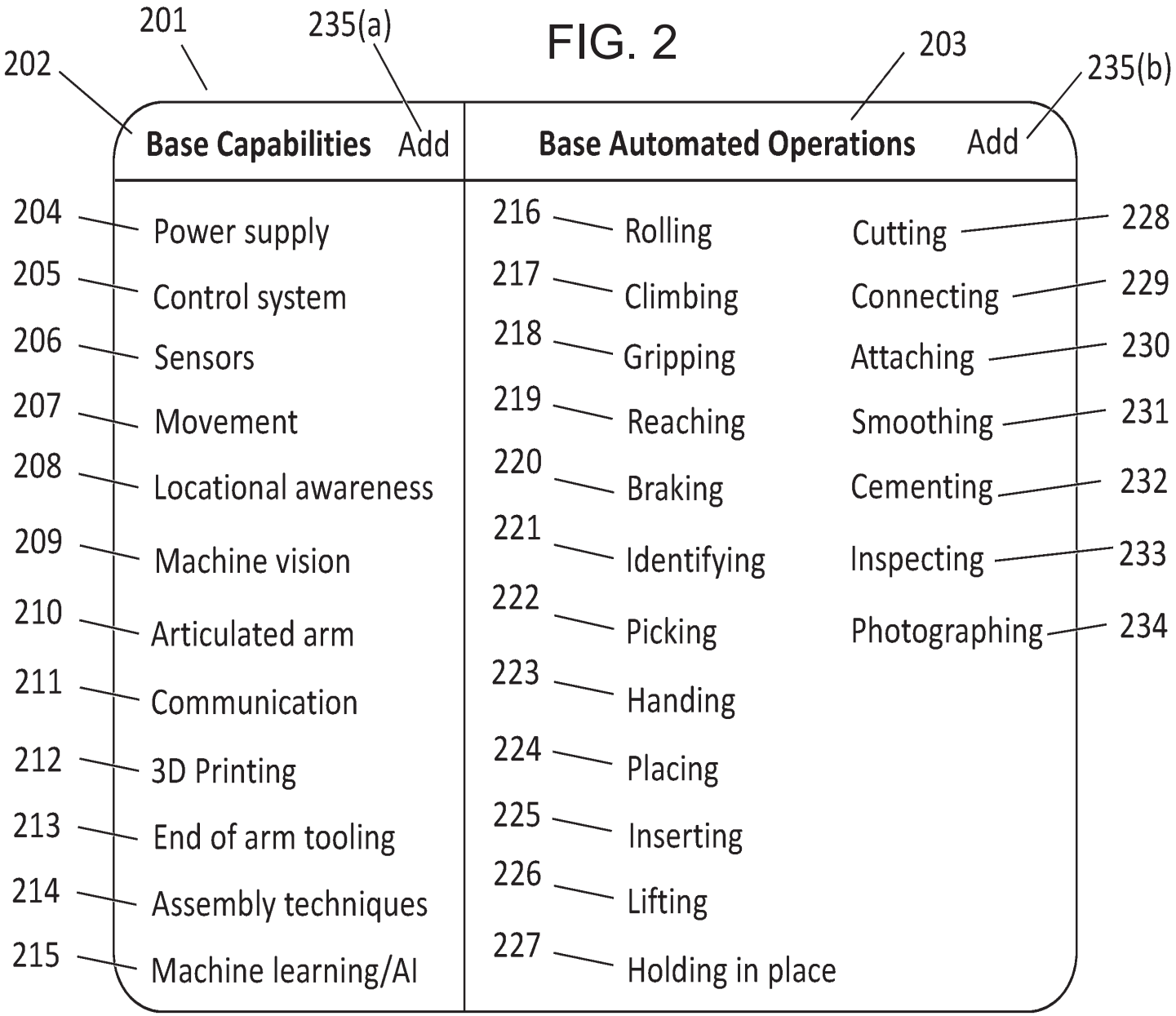

FIG. 2
201
202
235(a)
203
235(b)
Base Capabilities
Add
Base Automated Operations
Add
204
Power supply
205
Control system
206
Sensors
207
Movement
208
Locational awareness
209
Machine vision
210
Articulated arm
211
Communication
212
3D Printing
213
End of arm tooling
214
Assembly techniques
215
Machine learning/AI
216
Rolling
217
Climbing
218
Gripping
219
Reaching
220
Braking
221
Identifying
222
Picking
223
Handing
224
Placing
225
Inserting
226
Lifting
227
Holding in place
228
Cutting
229
Connecting
230
Attaching
231
Smoothing
232
Cementing
233
Inspecting
234
Photographing

FIG. 3A

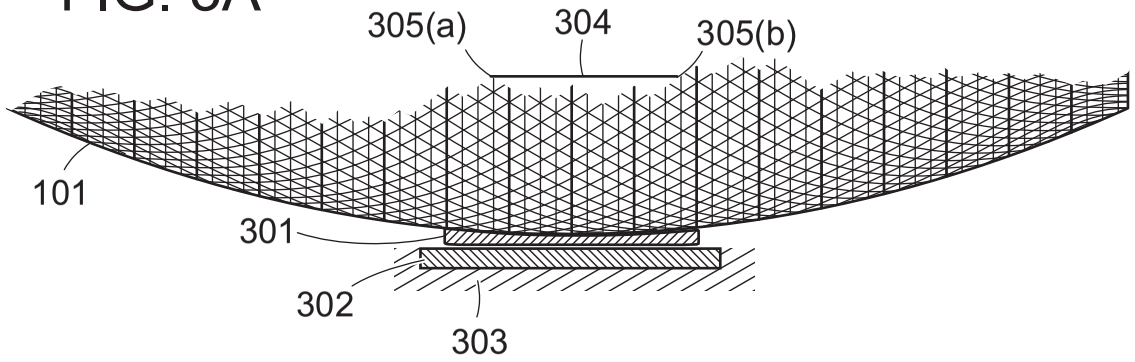
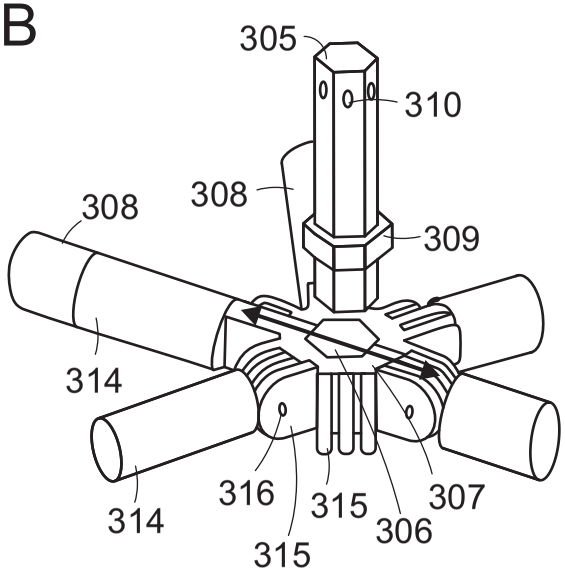


FIG. 3B



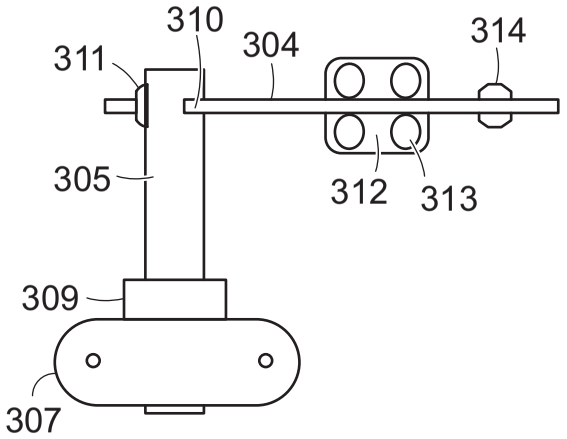


FIG. 3C
(A-A detail)

FIG. 4A

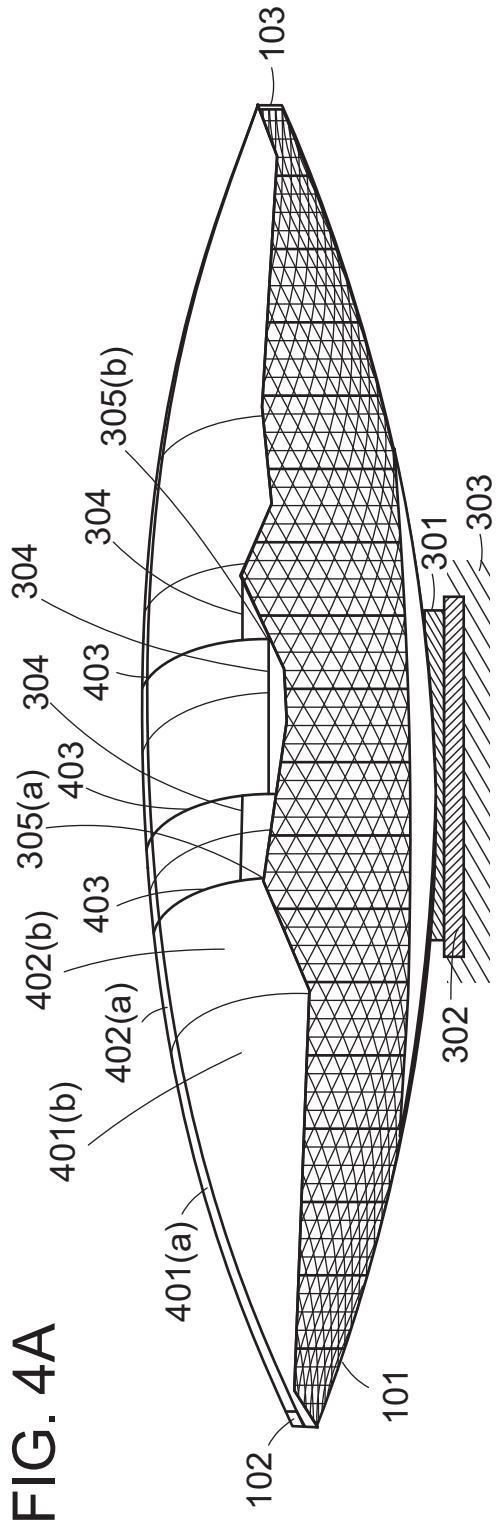


FIG. 4B

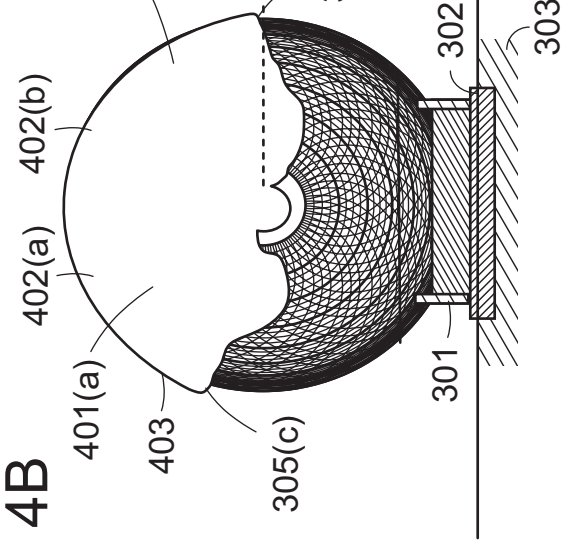


FIG. 4C

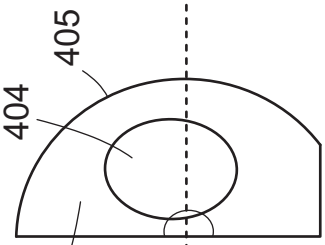


FIG. 4D

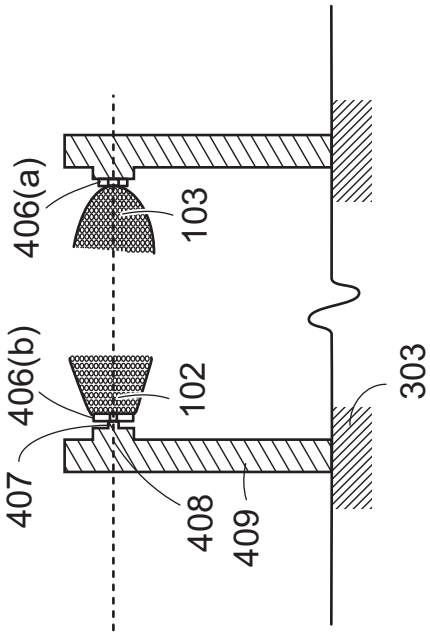


FIG. 5A

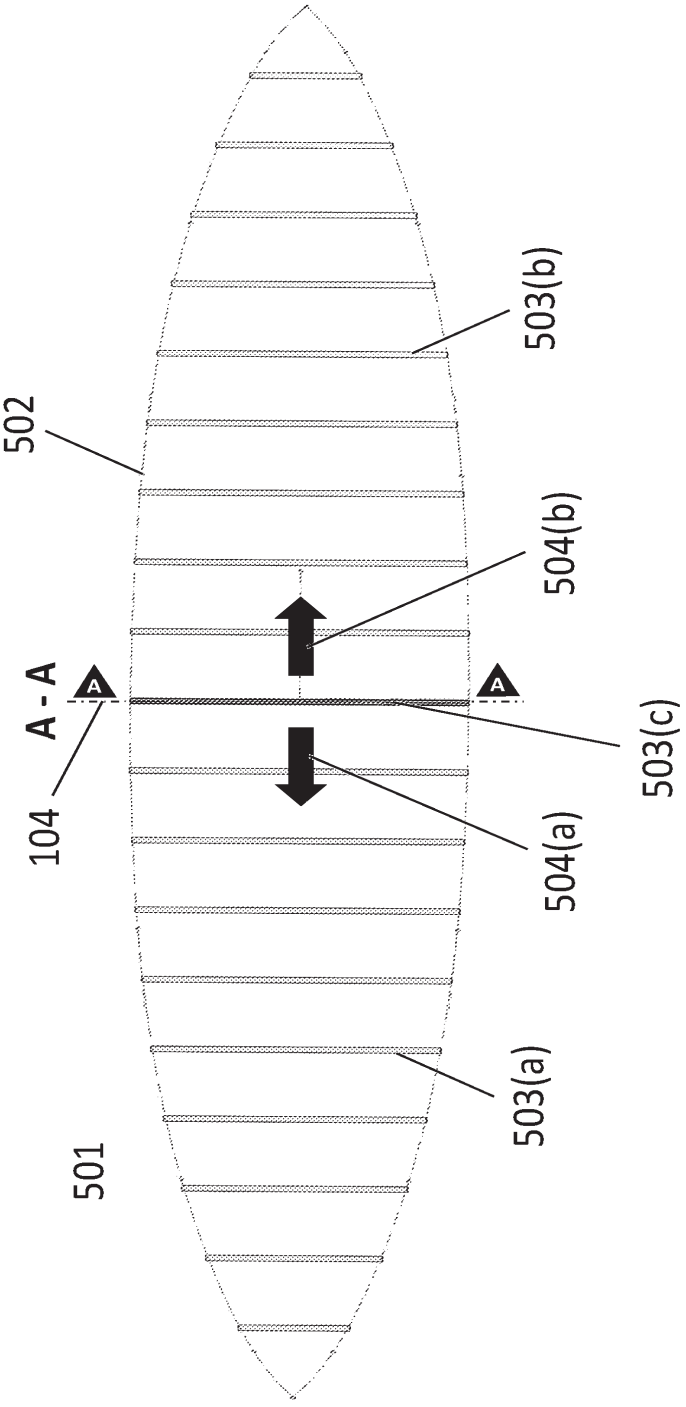


FIG. 5B

(A-A detail)

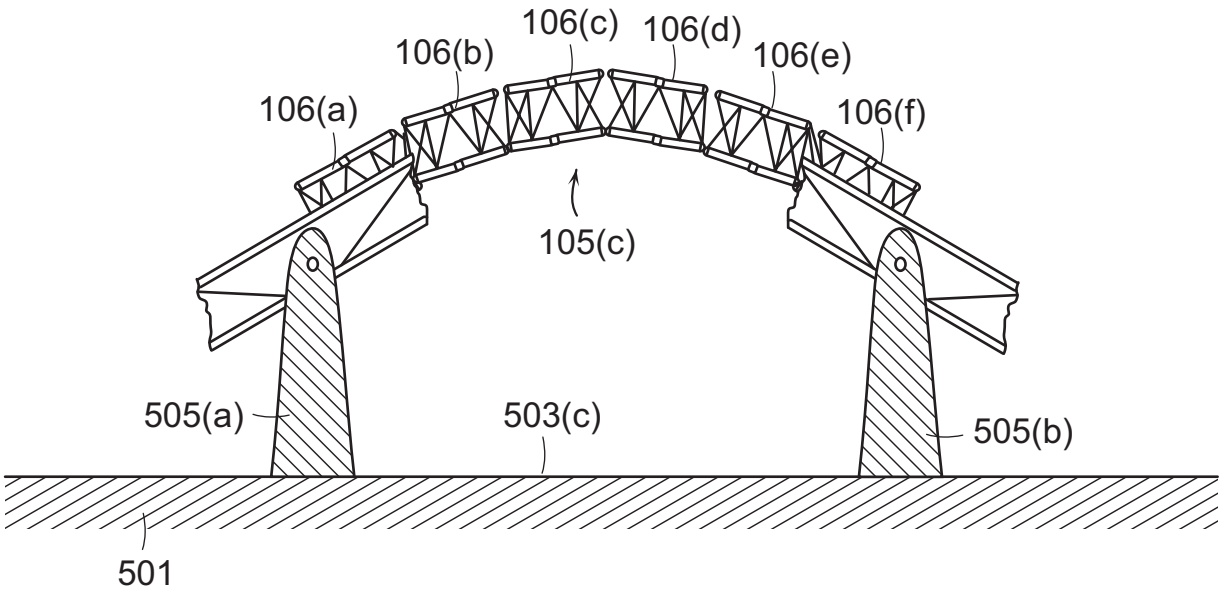
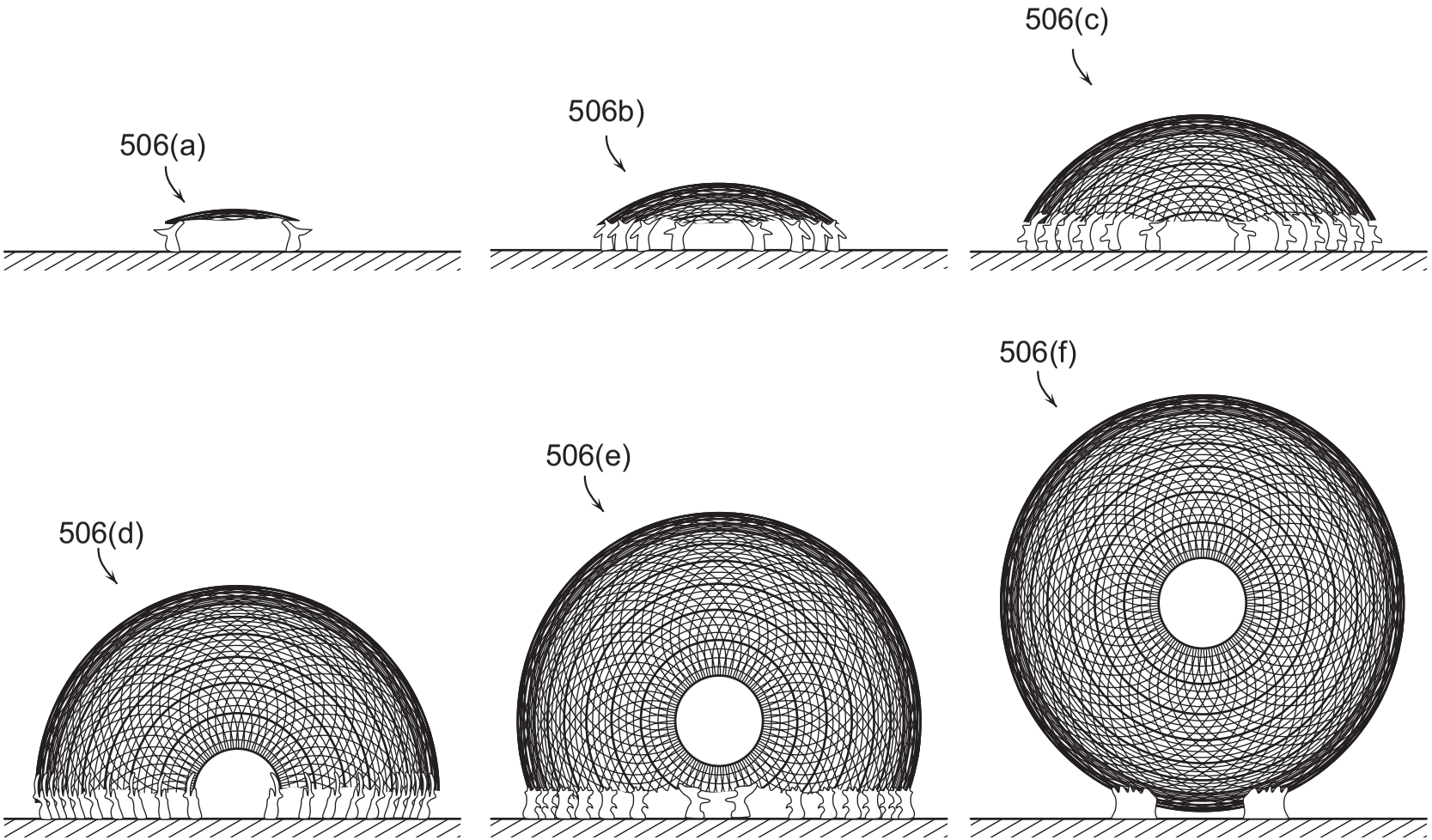


FIG. 5C

(A-A detail)



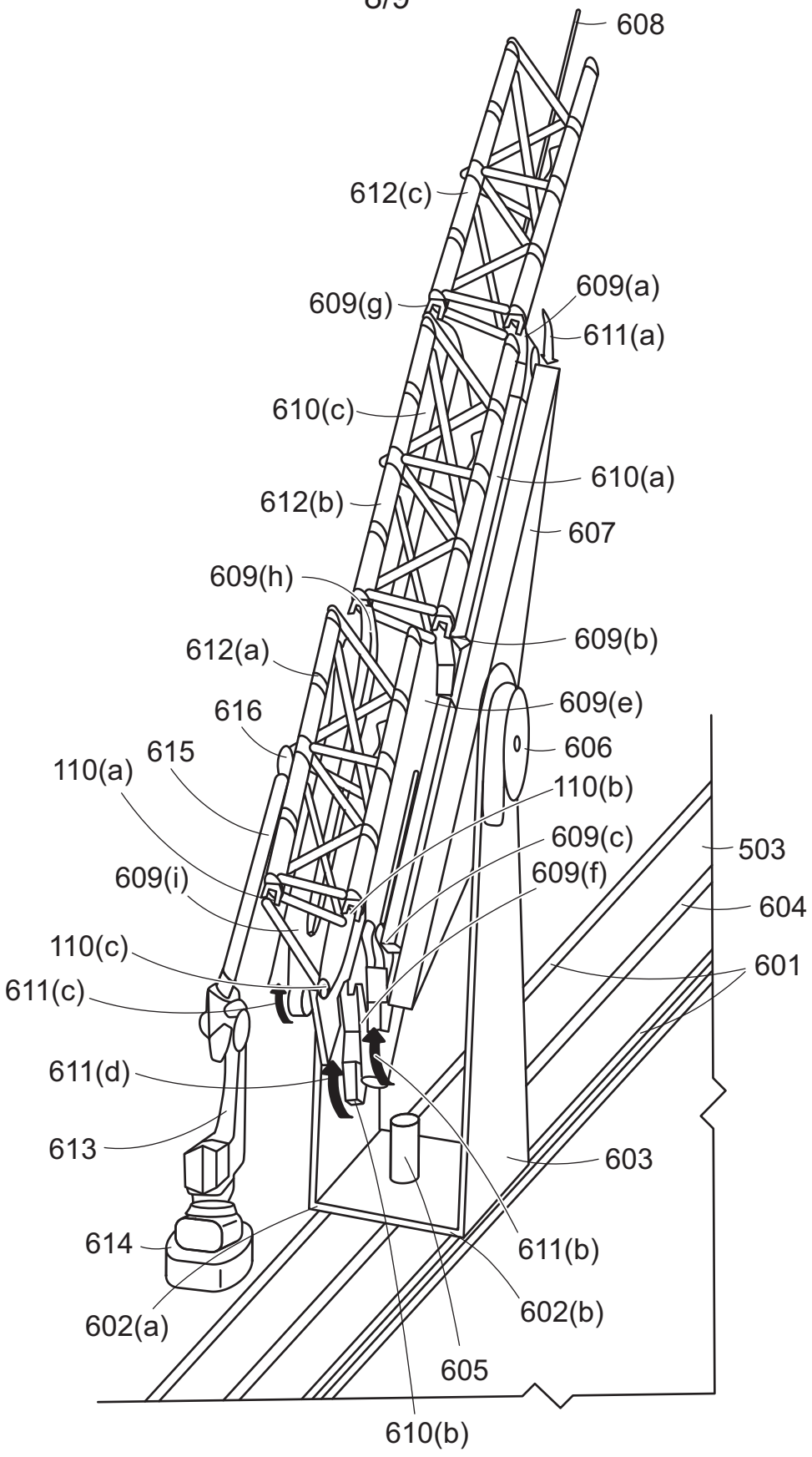

608
612(c)
609(g)
609(a)
611(a)
610(c)
610(a)
612(b)
607
609(h)
609(b)
612(a)
609(e)
616
606
615
110(a)
110(b)
609(c)
503
609(i)
609(f)
604
110(c)
601
611(c)
611(d)
613
603
614
611(b)
602(a)
602(b)
605
610(b)

FIG. 6A

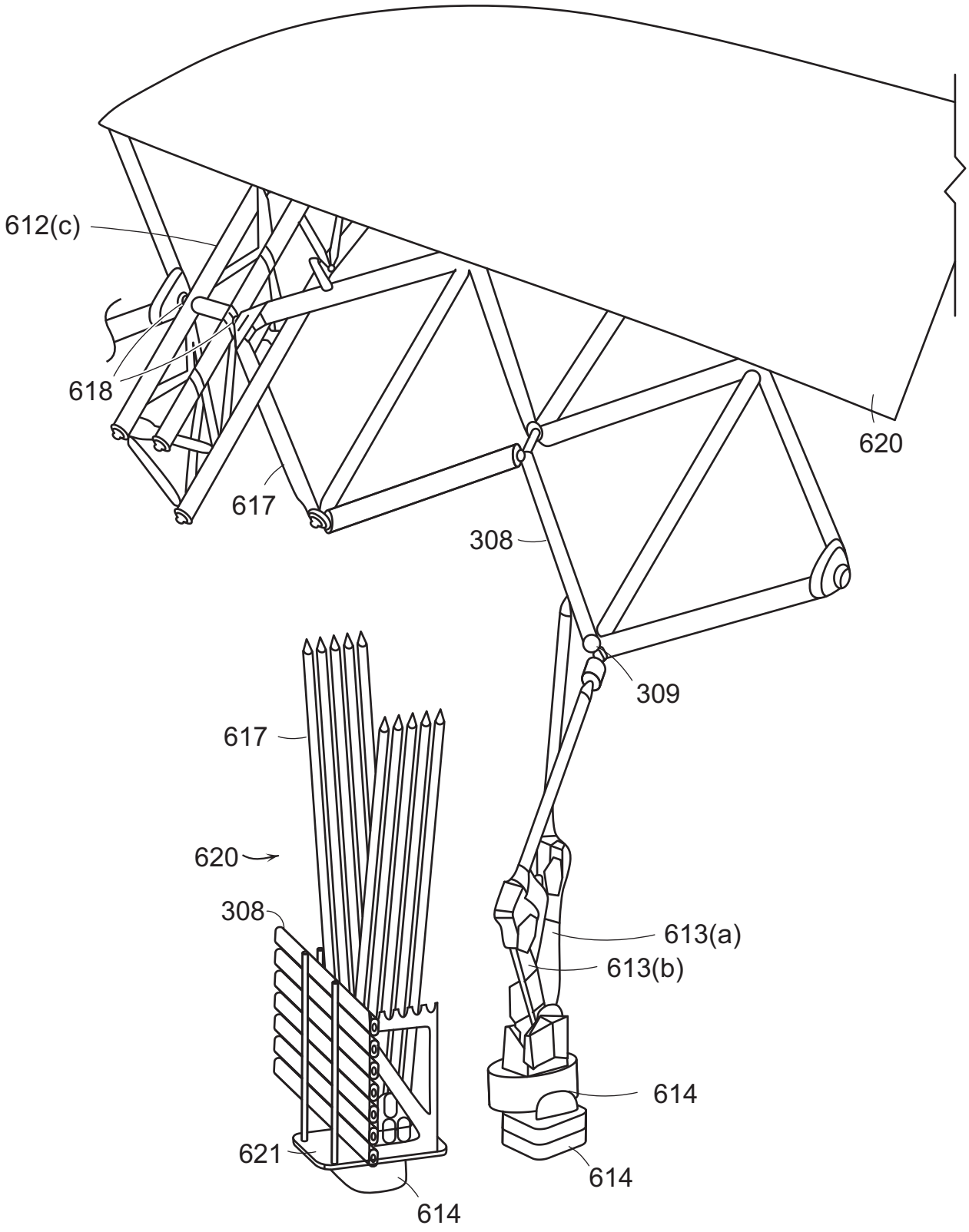


FIG. 6B