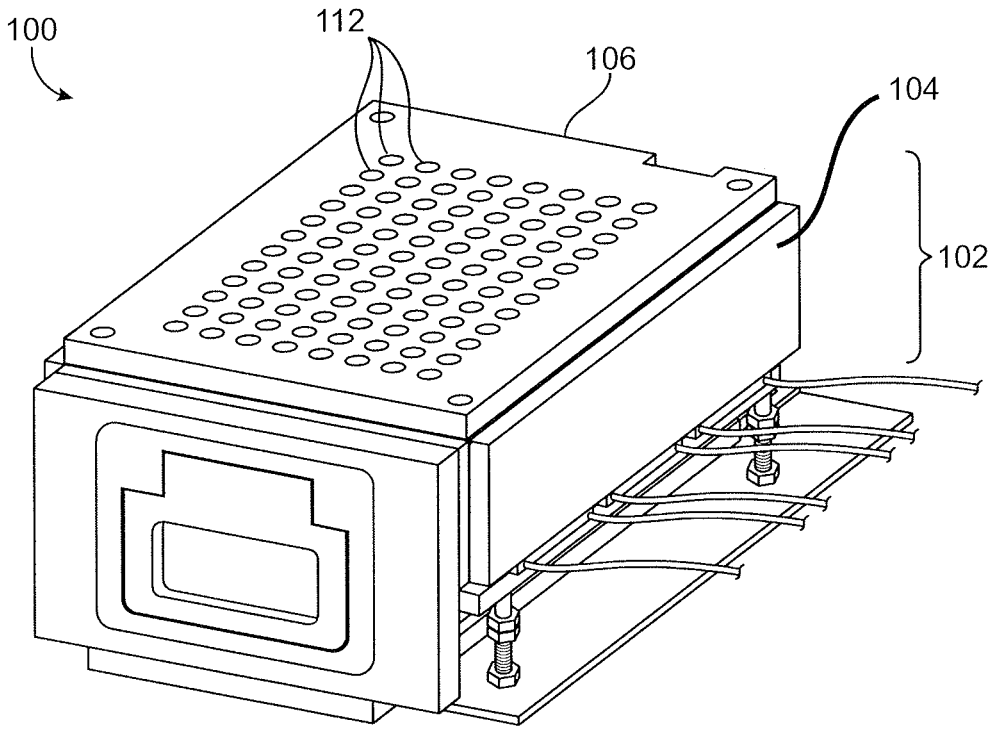


FIG. 1A

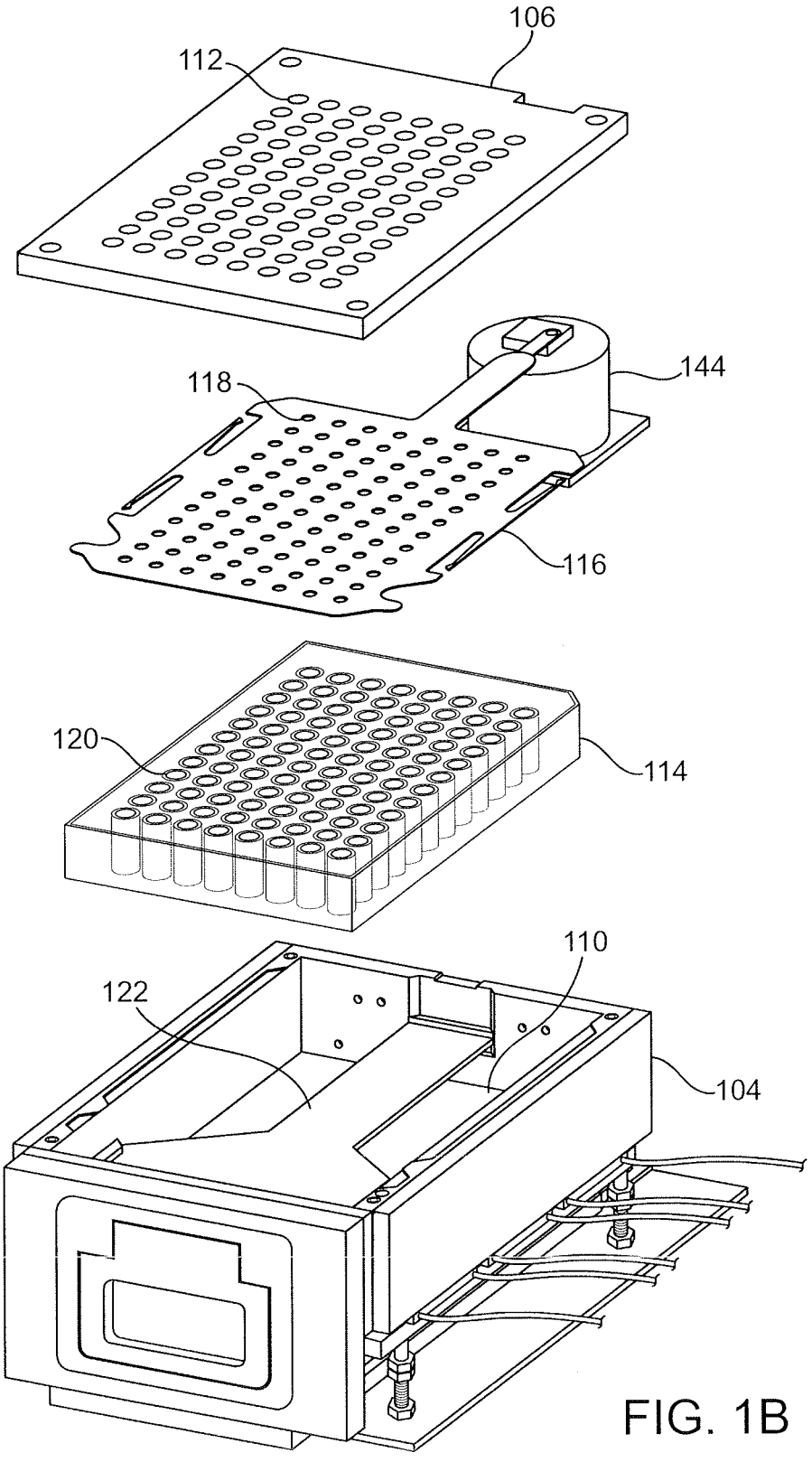


FIG. 1B

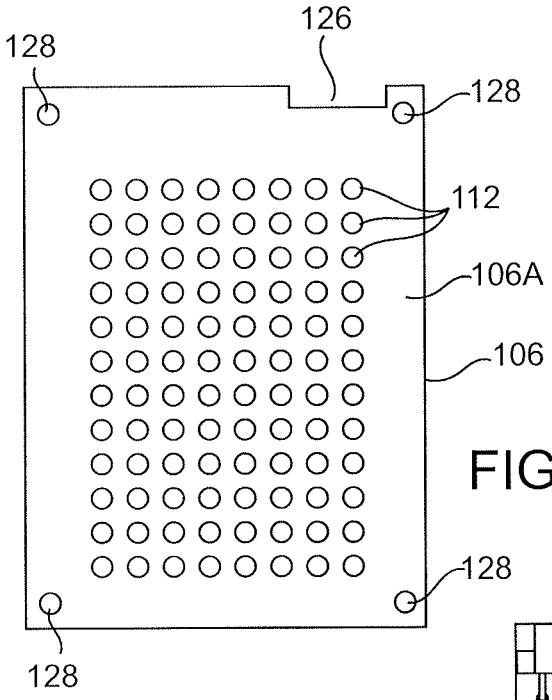


FIG. 2A

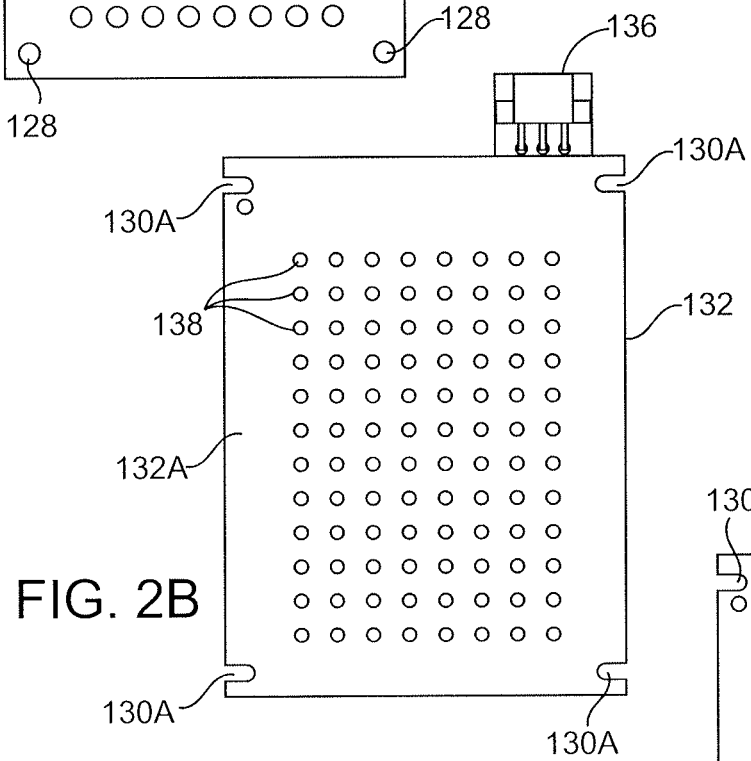


FIG. 2B

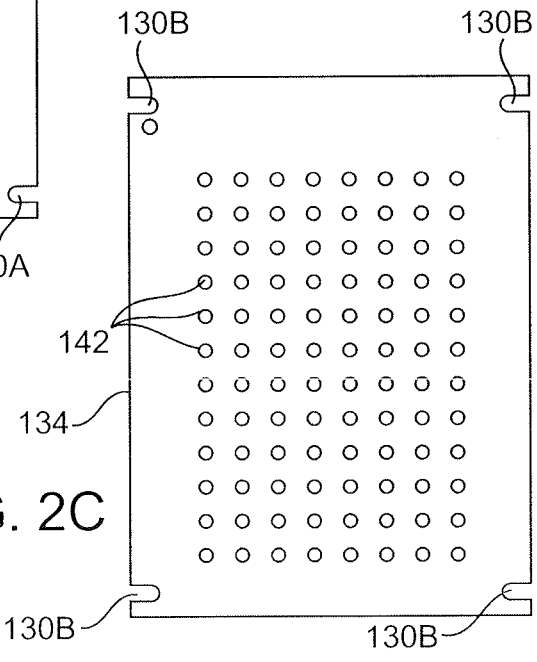


FIG. 2C

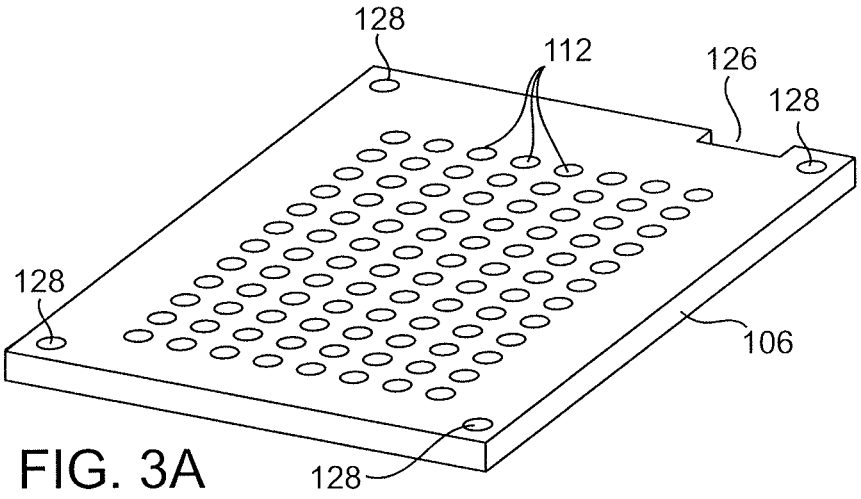


FIG. 3A

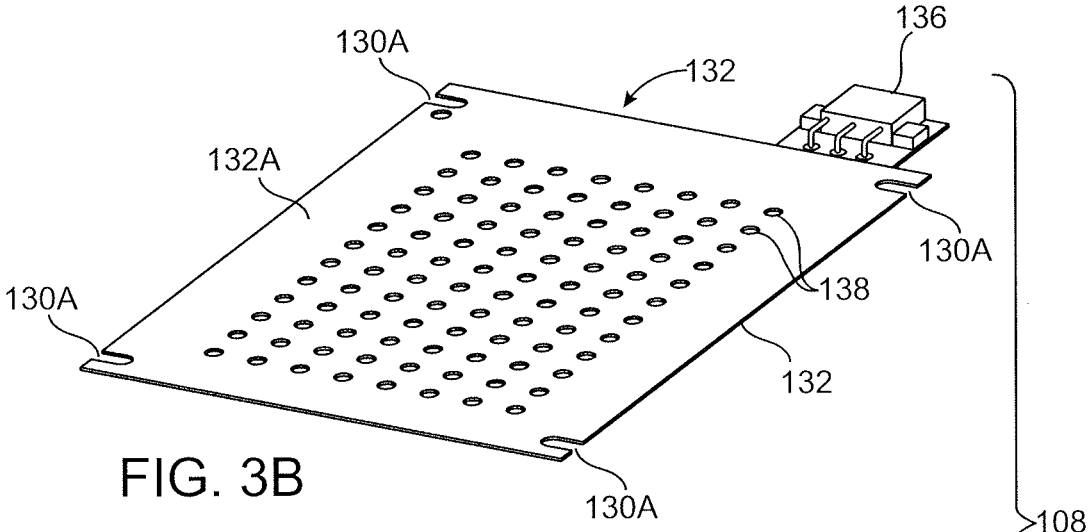


FIG. 3B

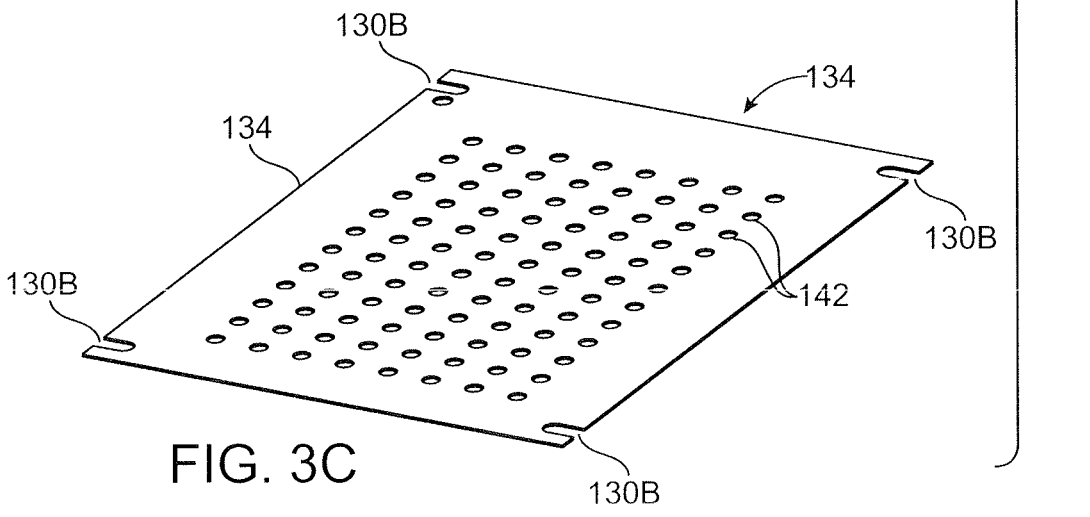


FIG. 3C

108

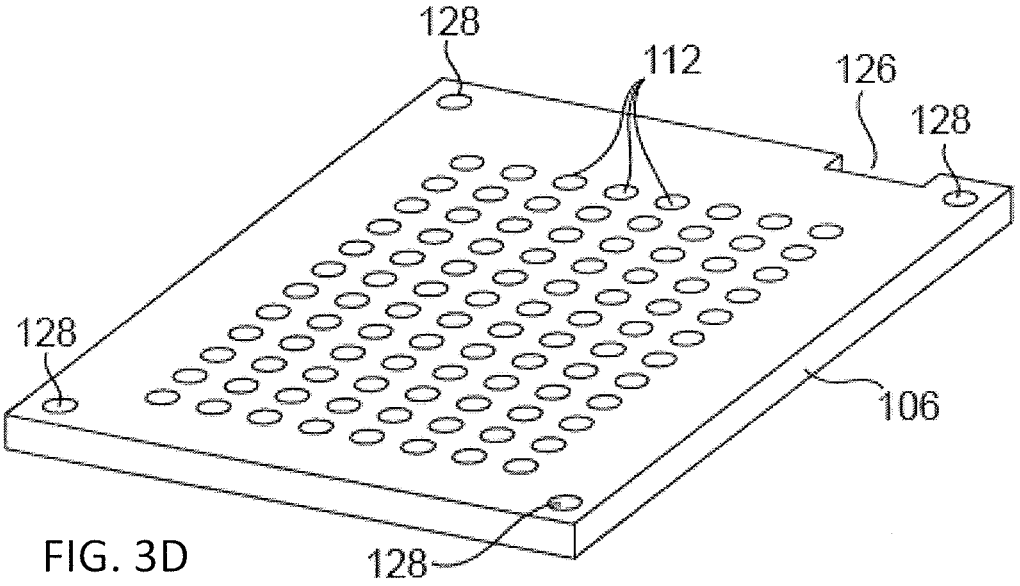


FIG. 3D

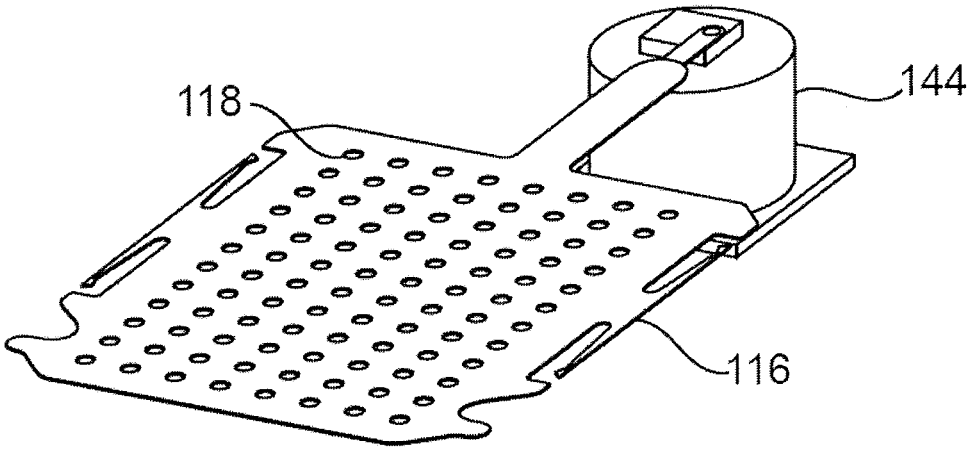


FIG. 3E

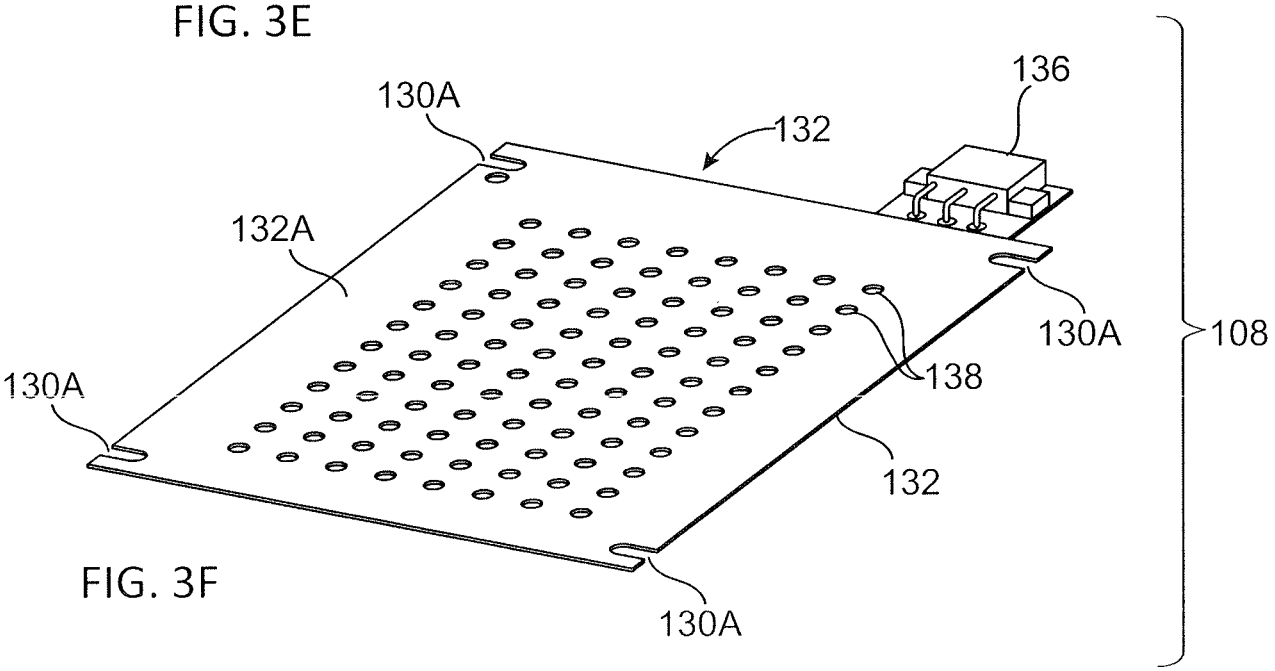


FIG. 3F

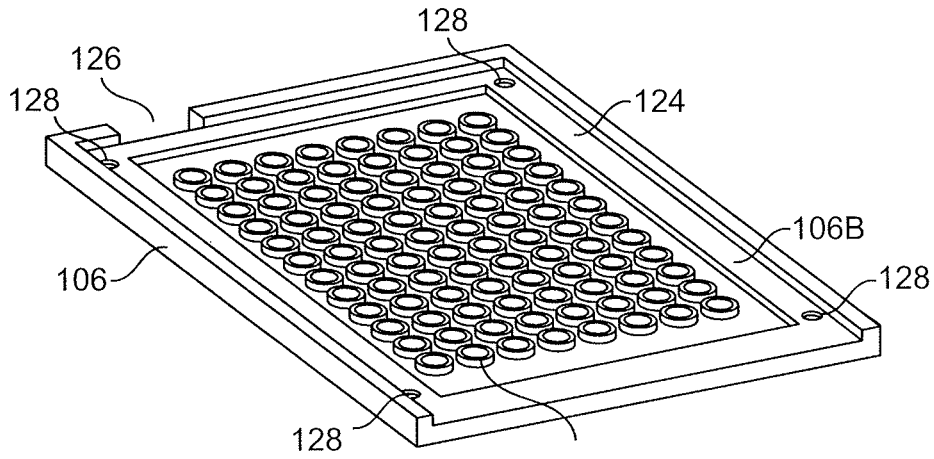

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FIG. 4A

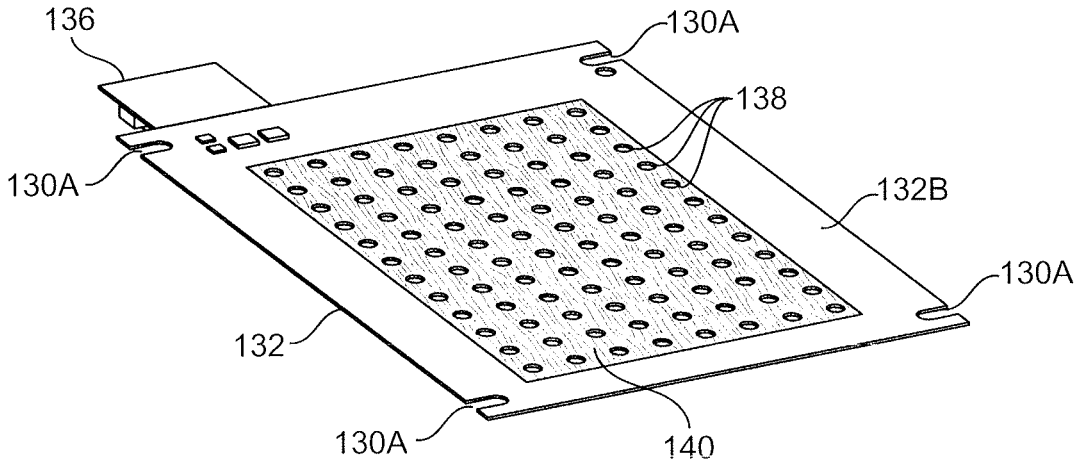

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130A
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130A
132B
130A
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130A
140

FIG. 4B

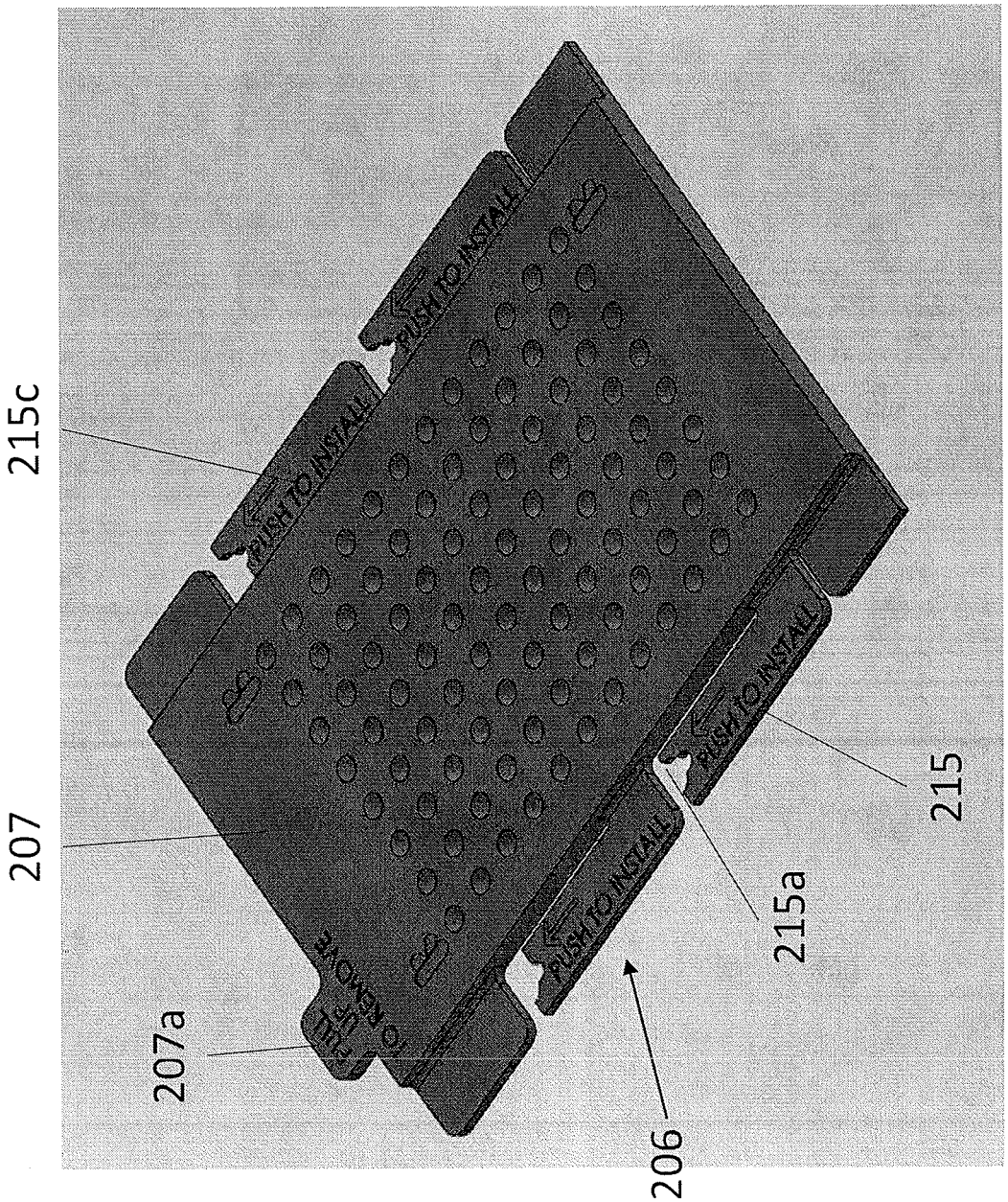

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207a
206
215a
215
PUSH TO INSTALL
PUSH TO INSTALL
PUSH TO INSTALL
PUSH TO INSTALL
PULL TO REMOVE

FIG. 5A



FIG. 5B

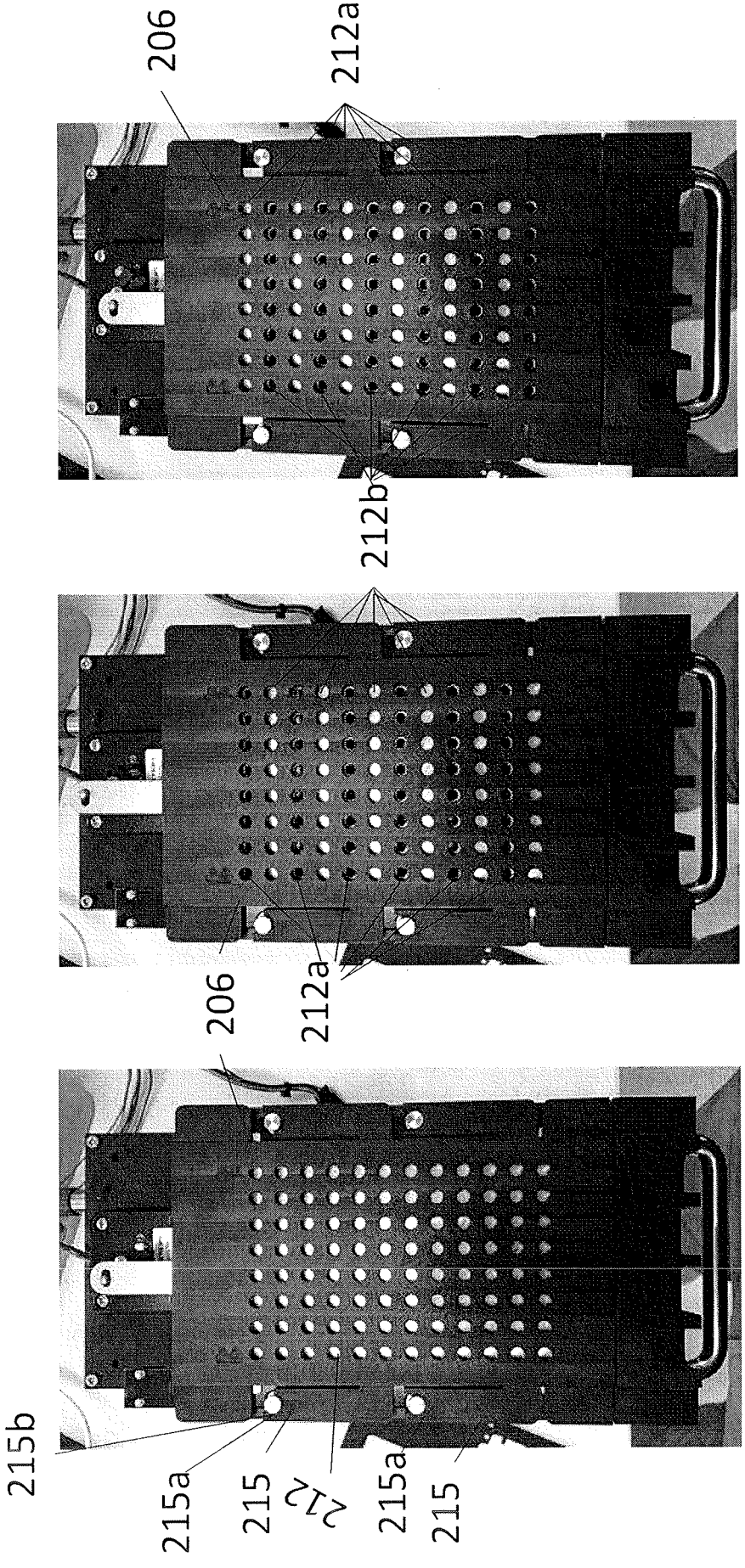


FIG. 5E

FIG. 5D

FIG. 5C

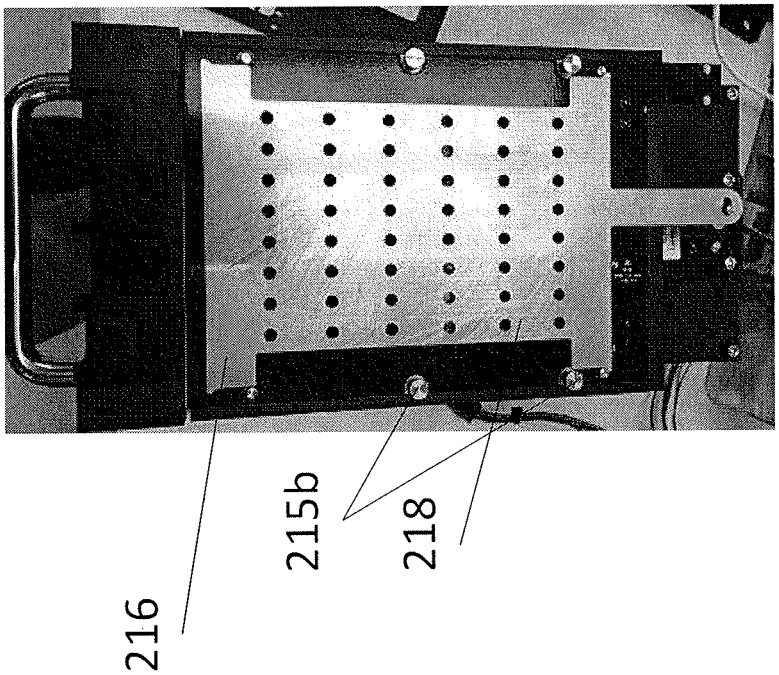


FIG. 5G

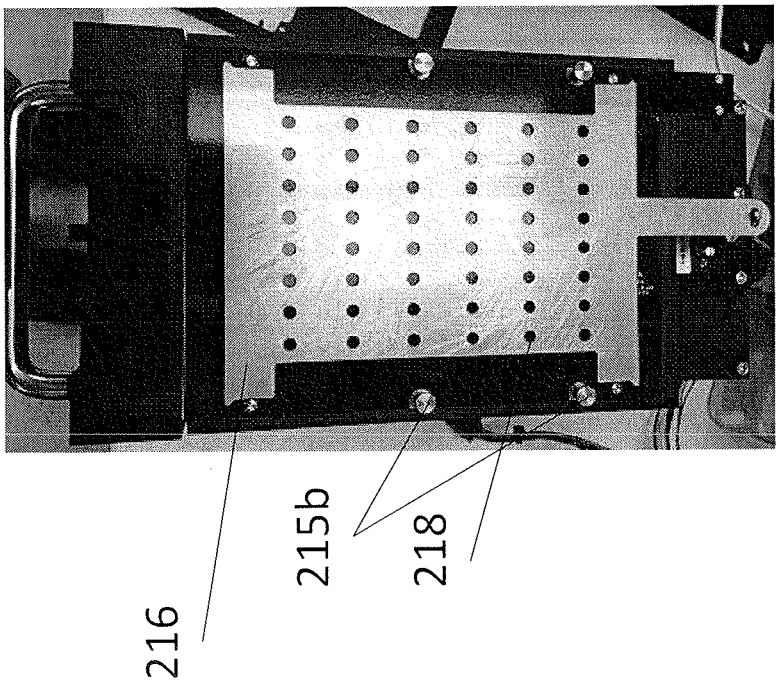


FIG. 5F

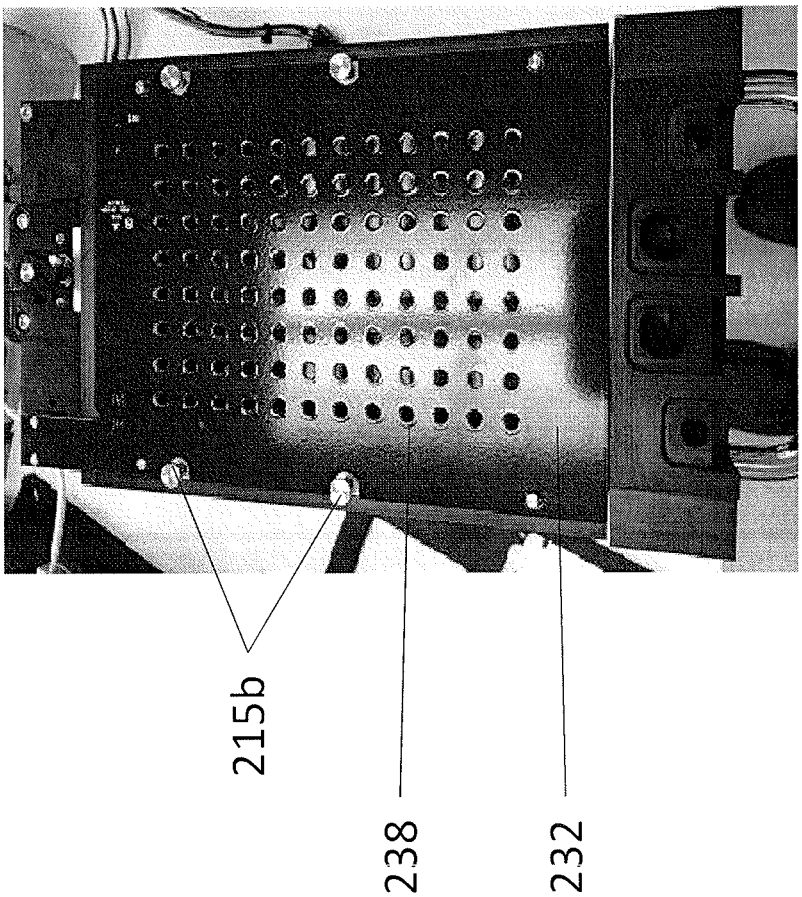


FIG. 5H

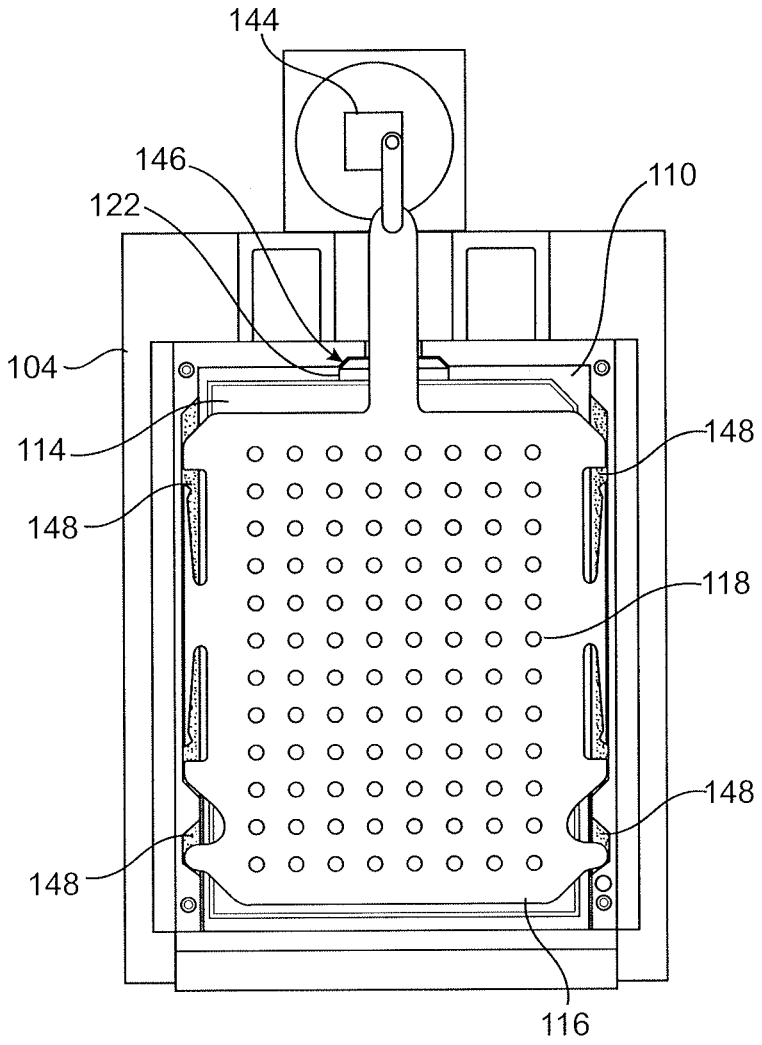


FIG. 6A

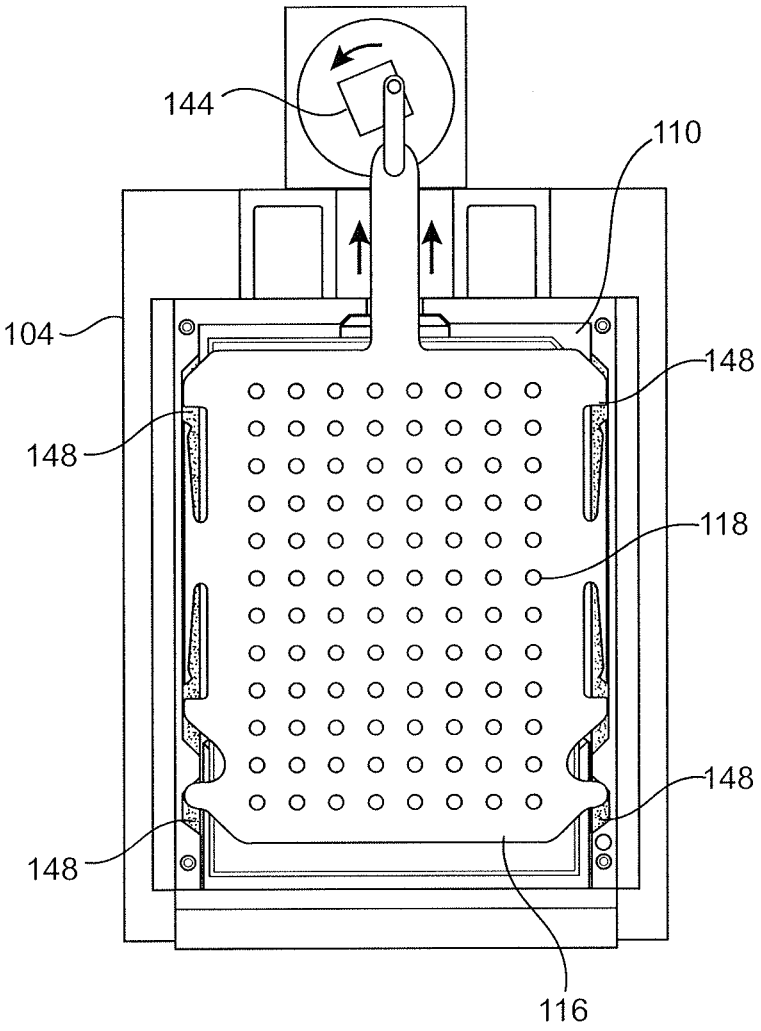


FIG. 6B

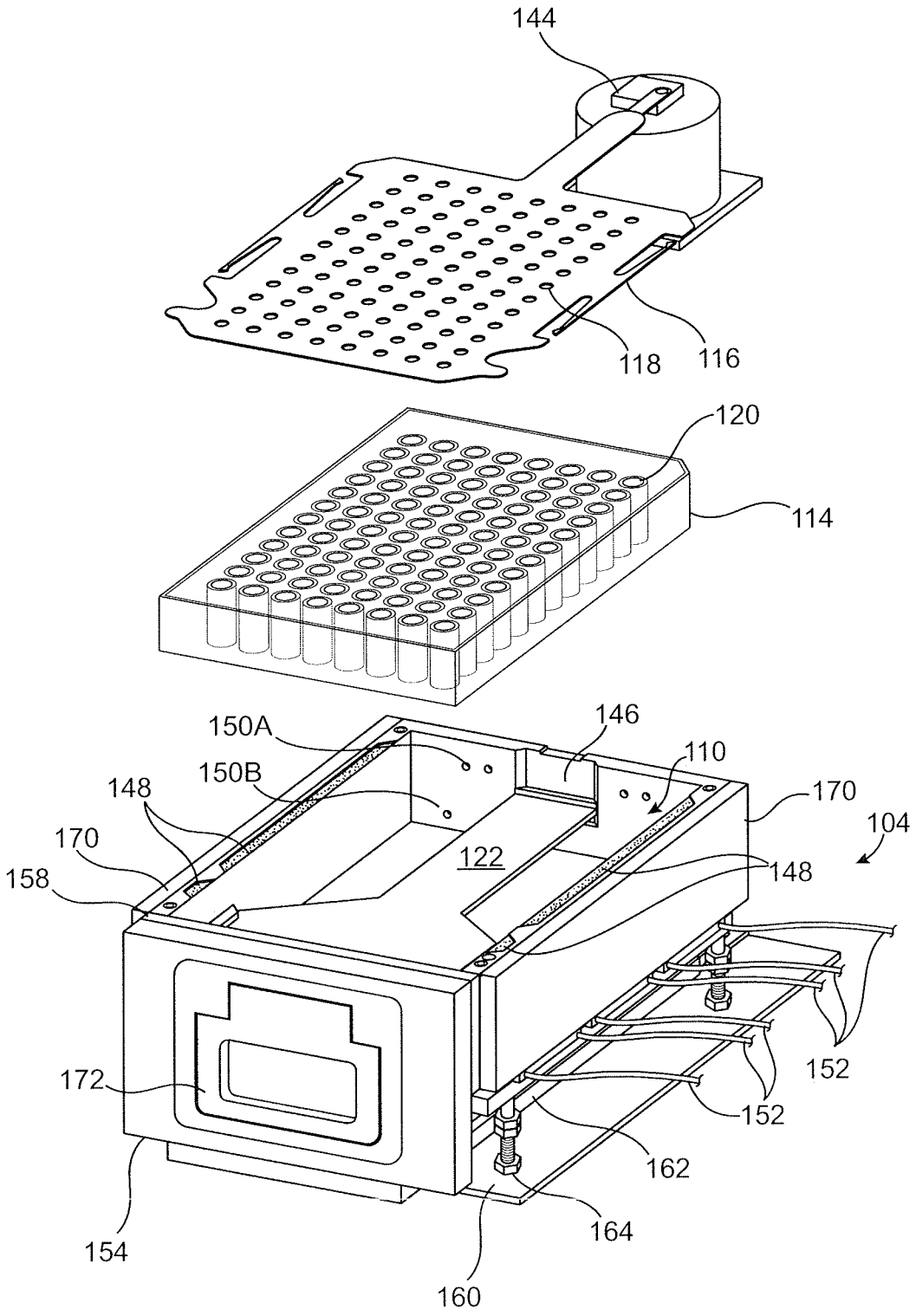

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FIG. 7

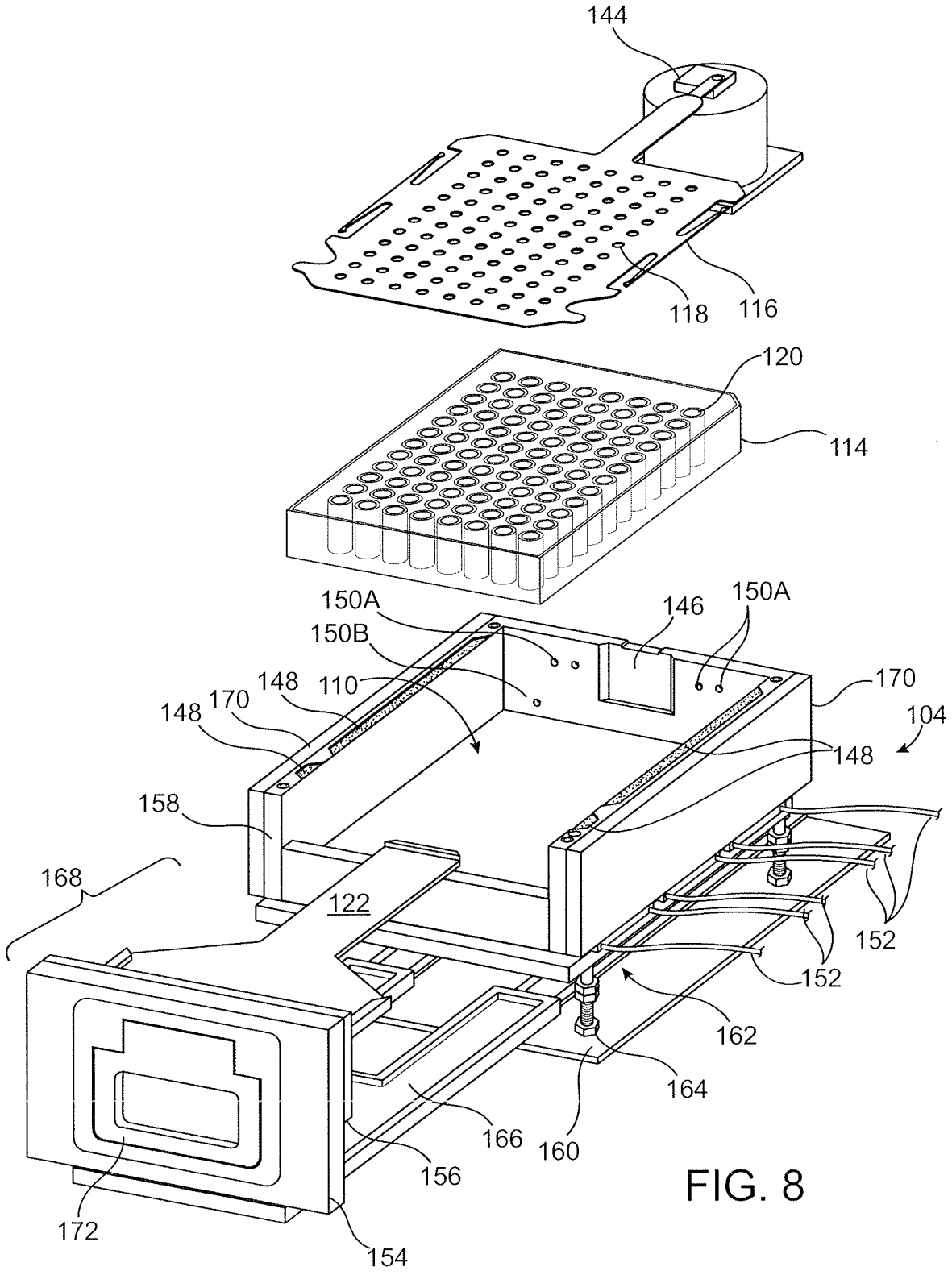

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FIG. 8

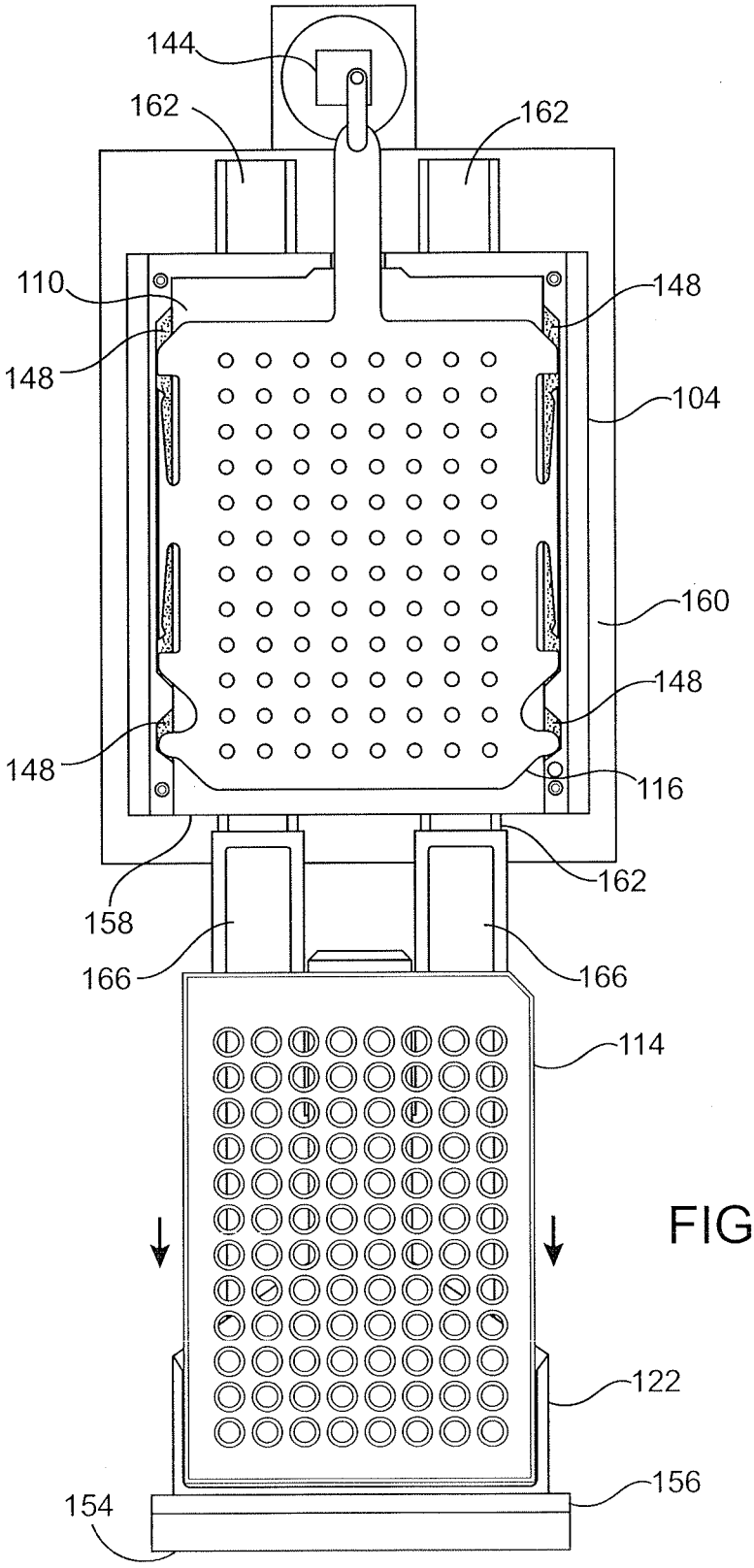

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FIG. 9

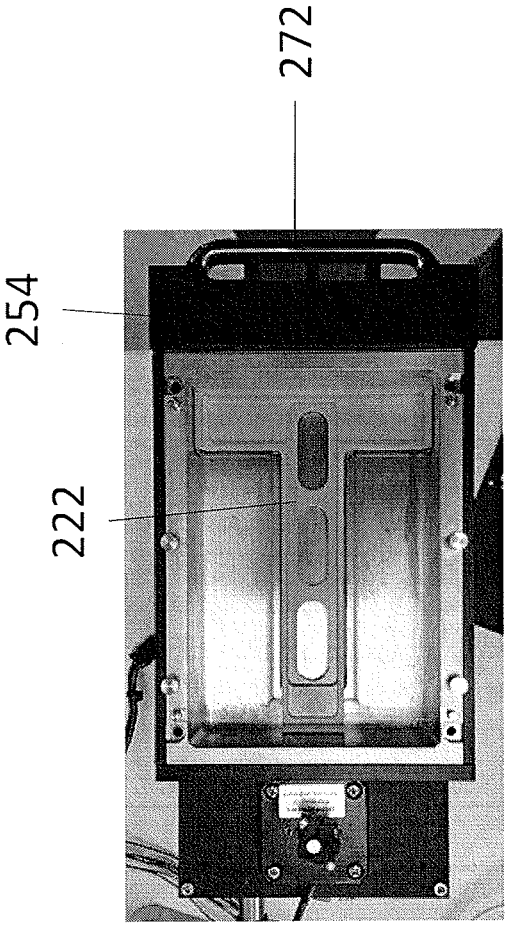


FIG. 10A

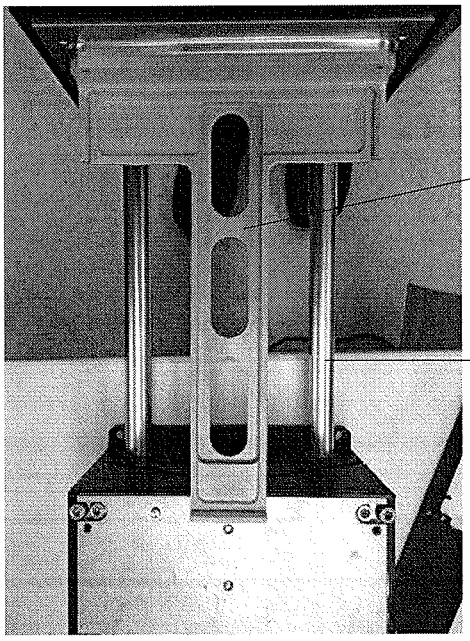


FIG. 10B

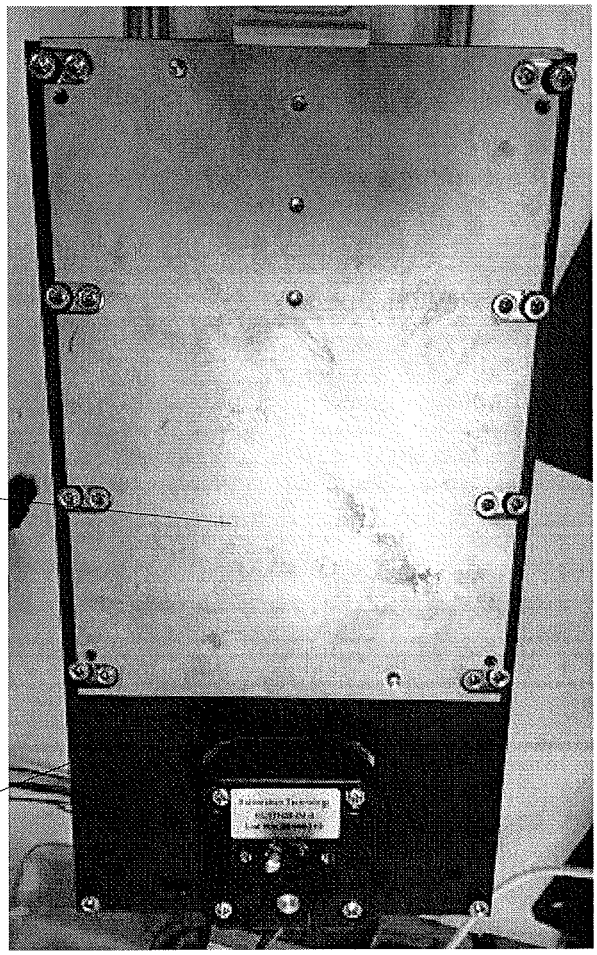


FIG. 10C

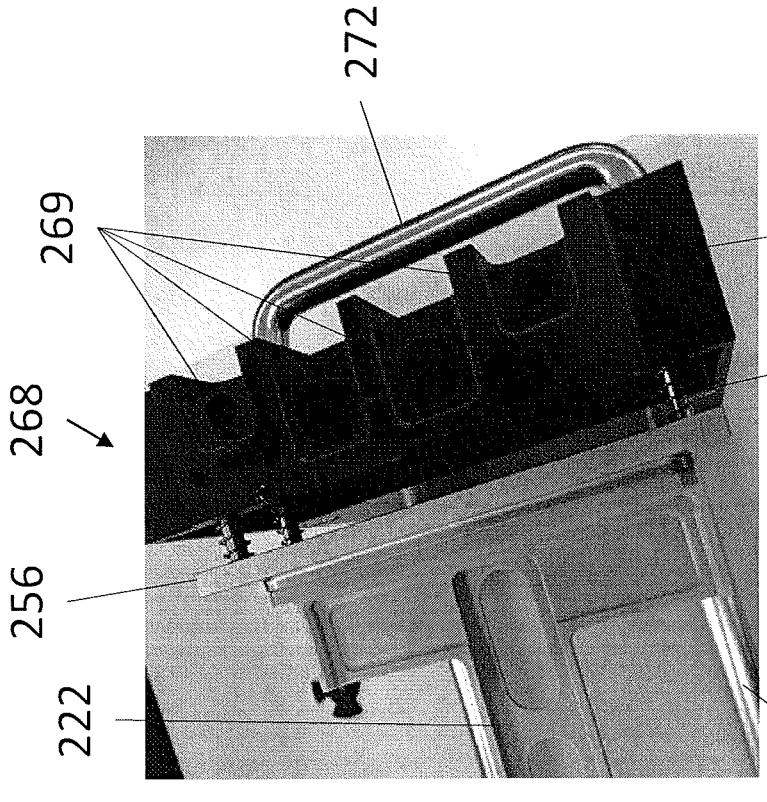


FIG. 11B

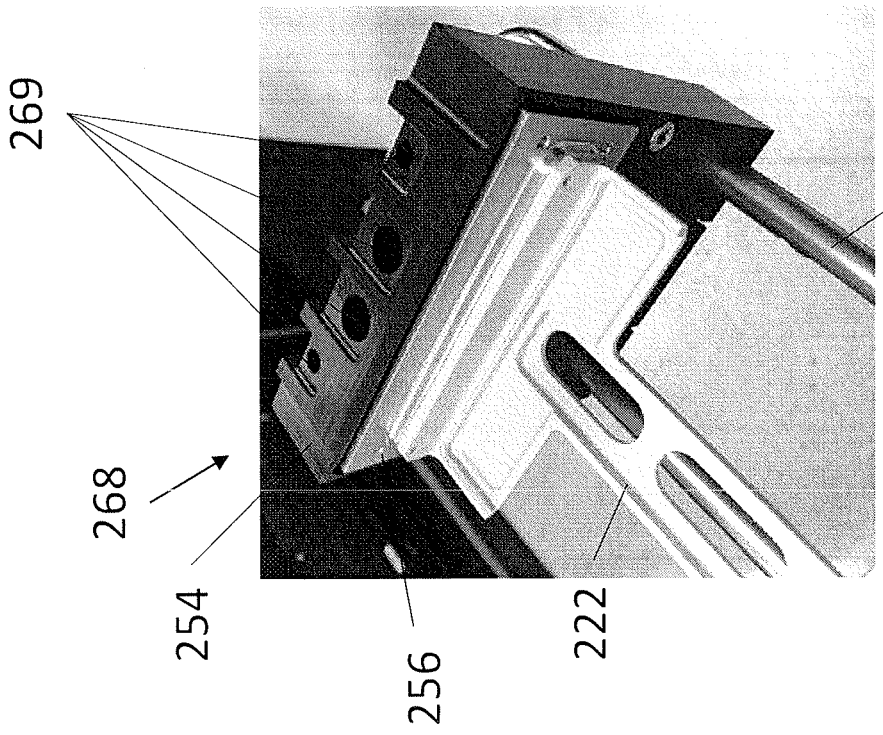


FIG. 11A

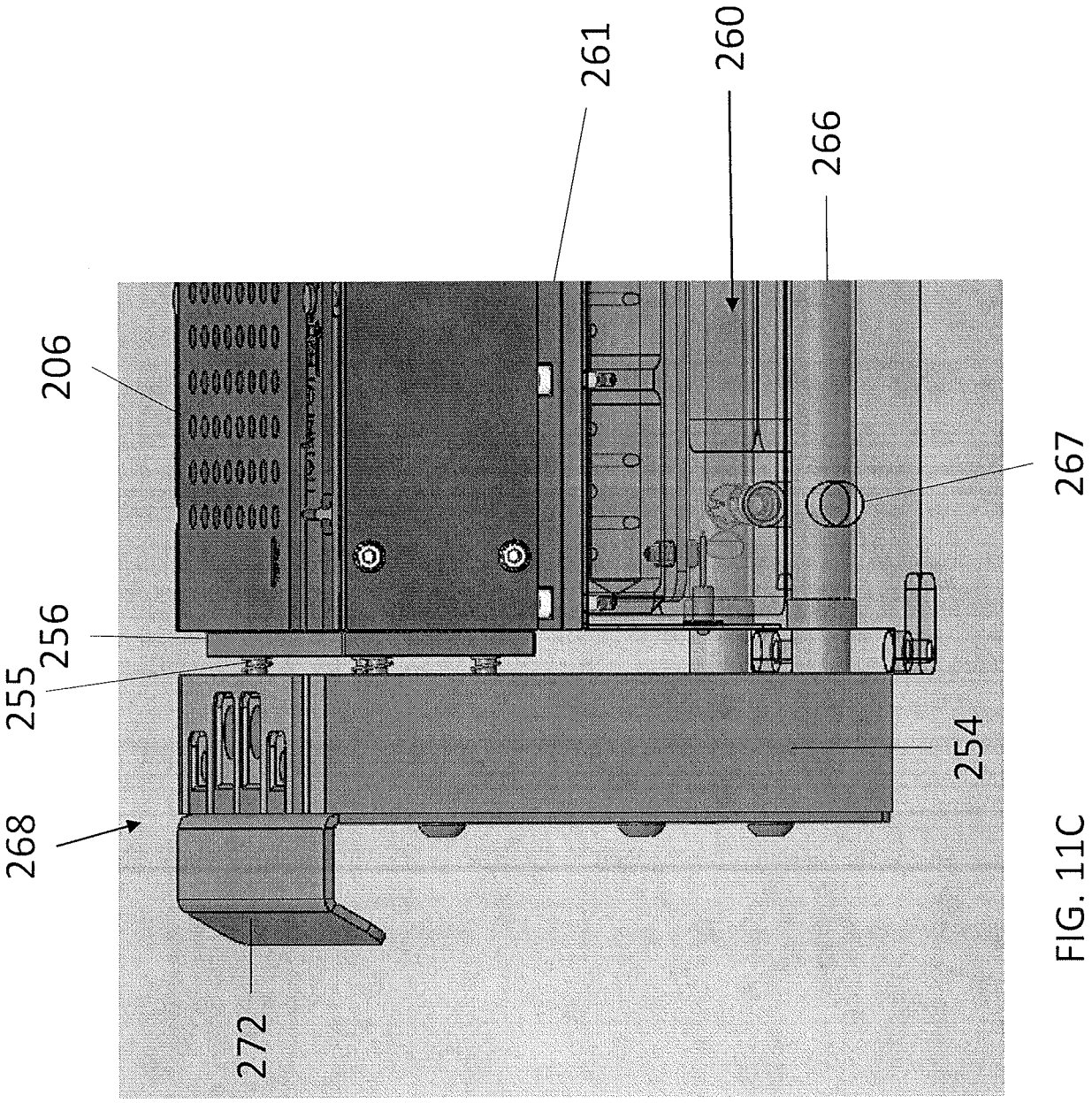


FIG. 11C

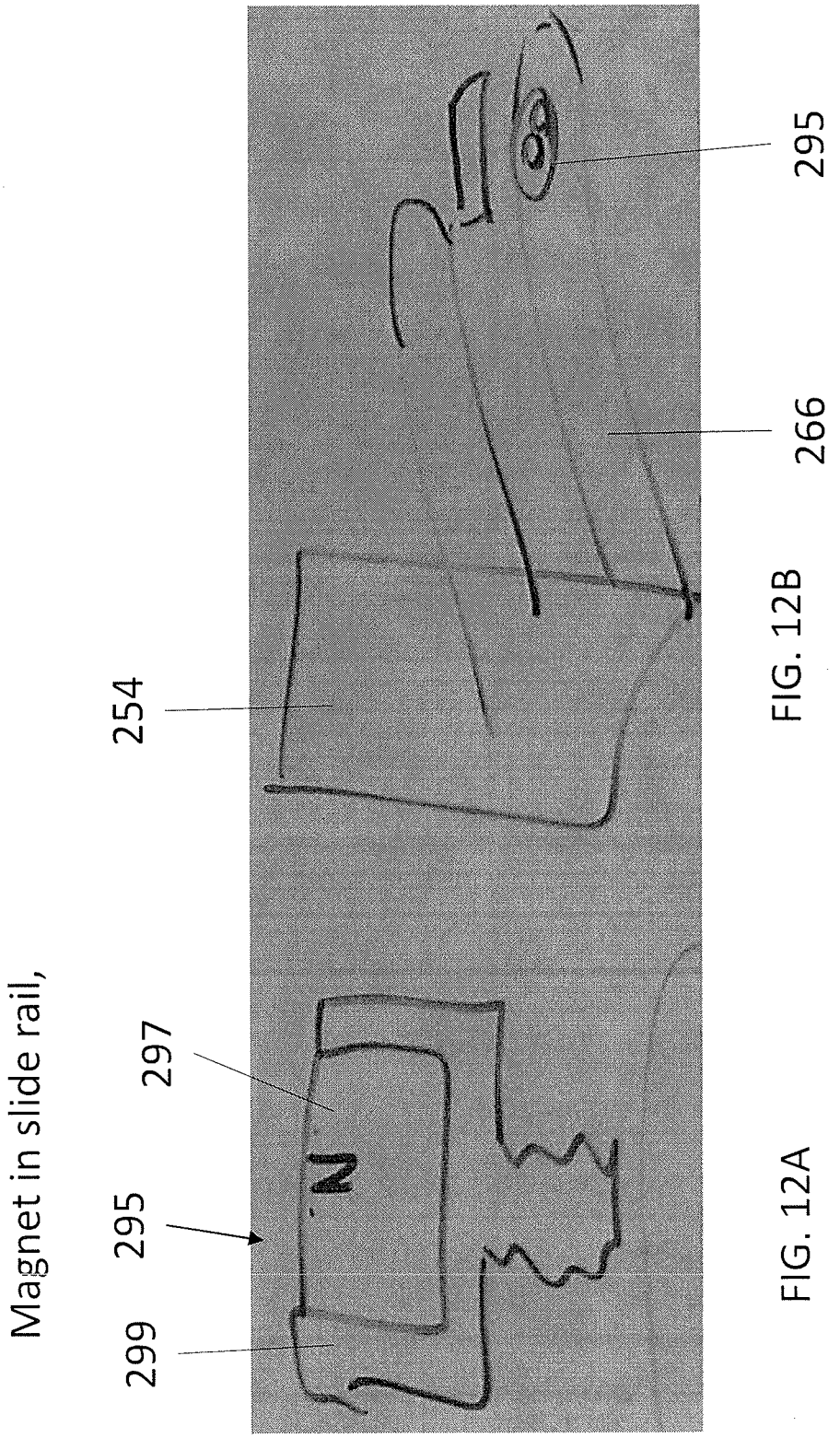


FIG. 12A

FIG. 12B

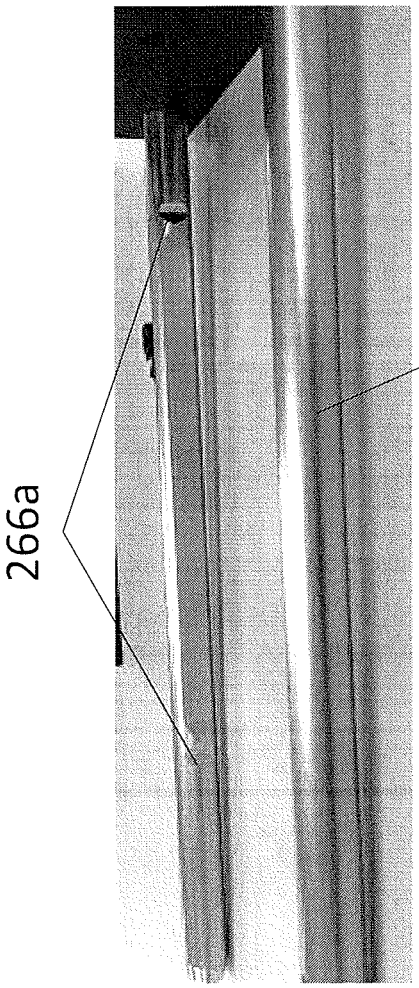


FIG. 13

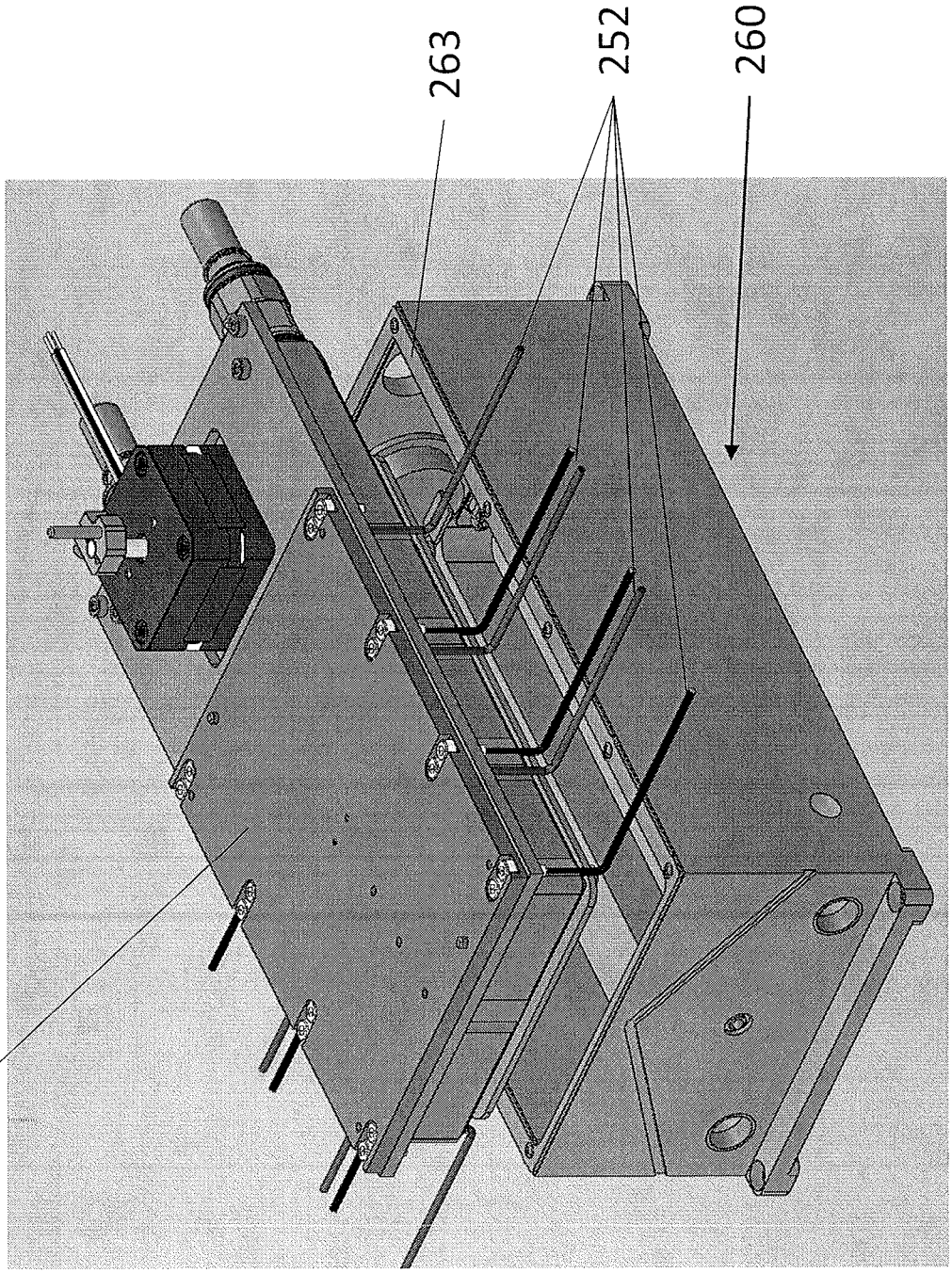


FIG. 14

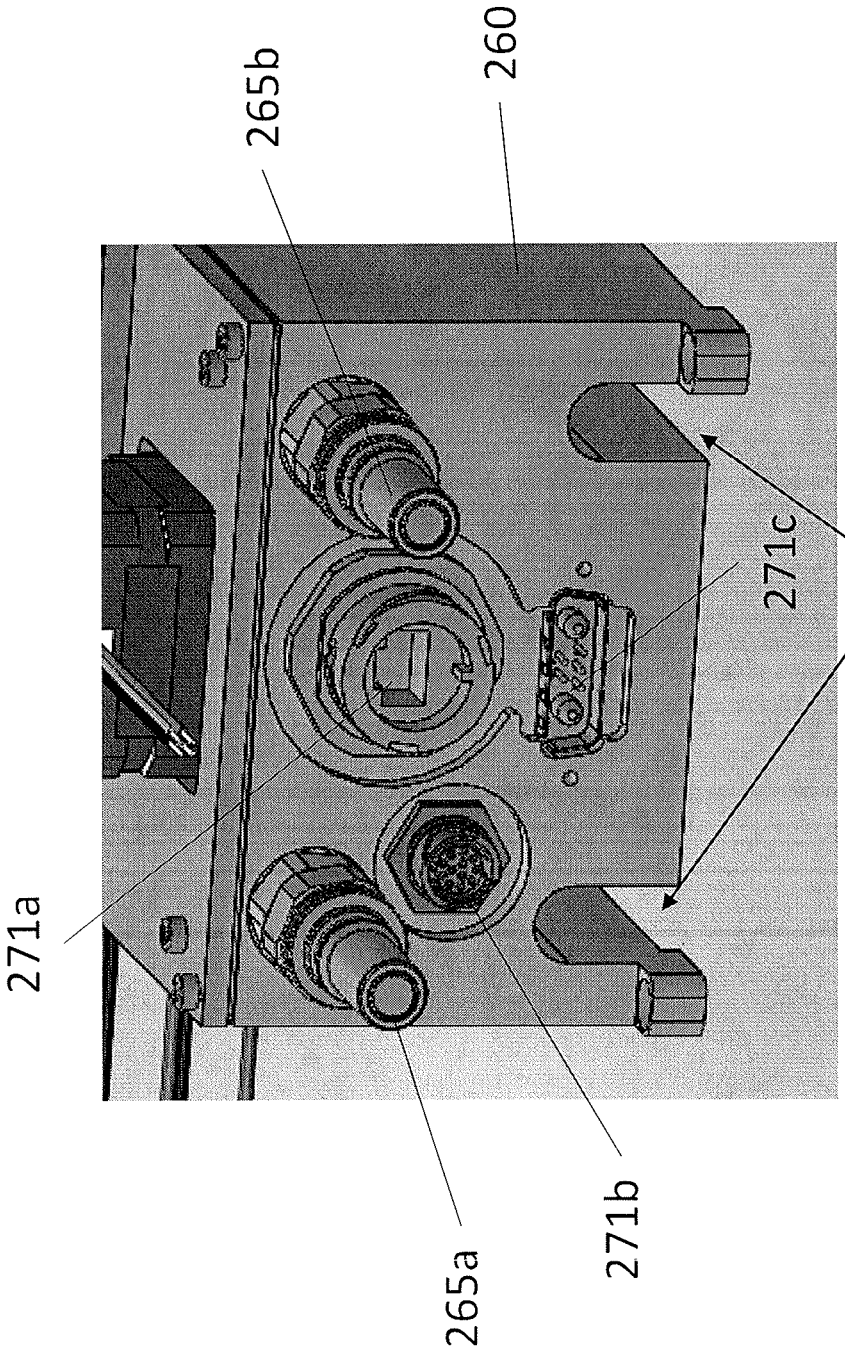


FIG. 15

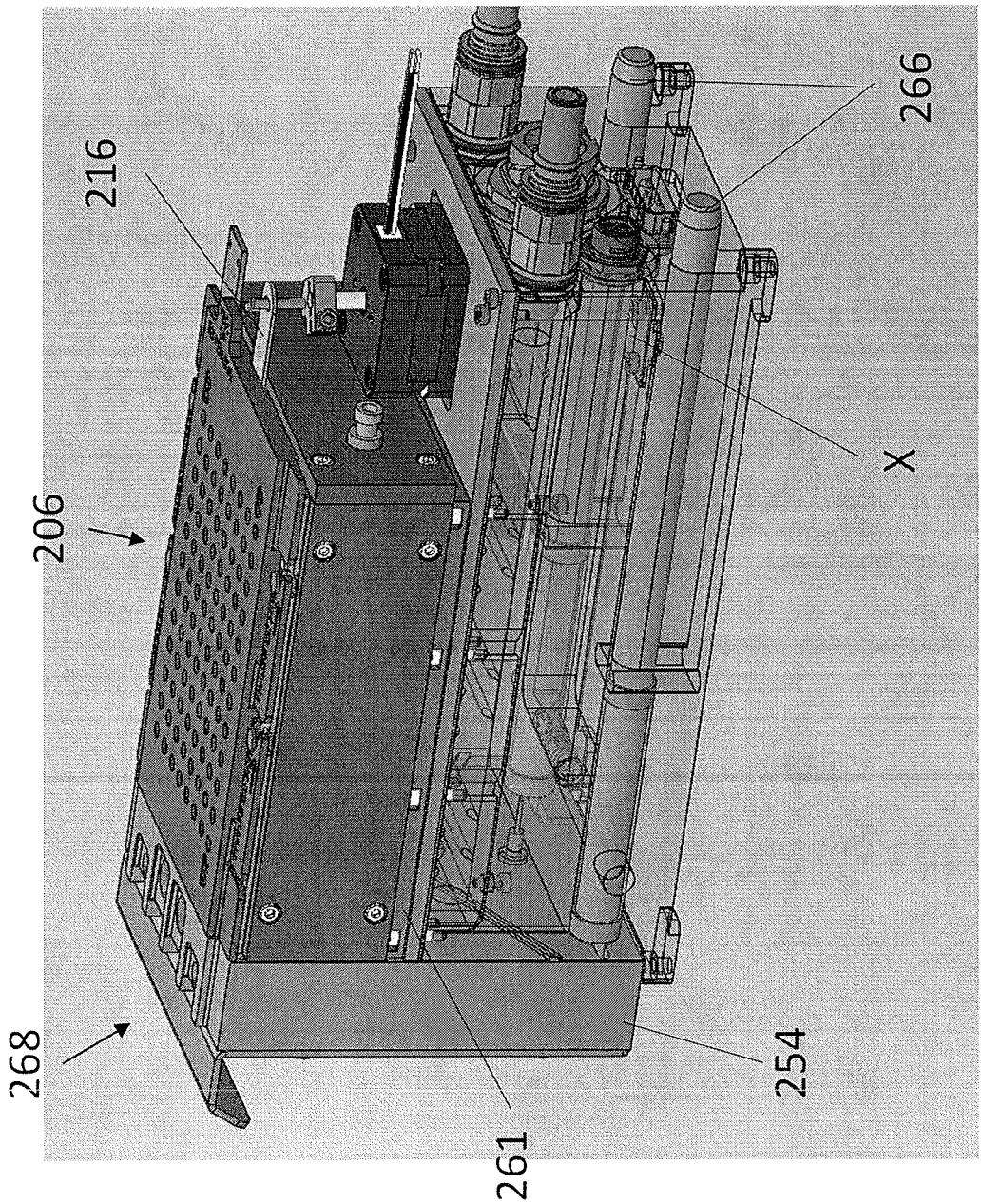


FIG. 16

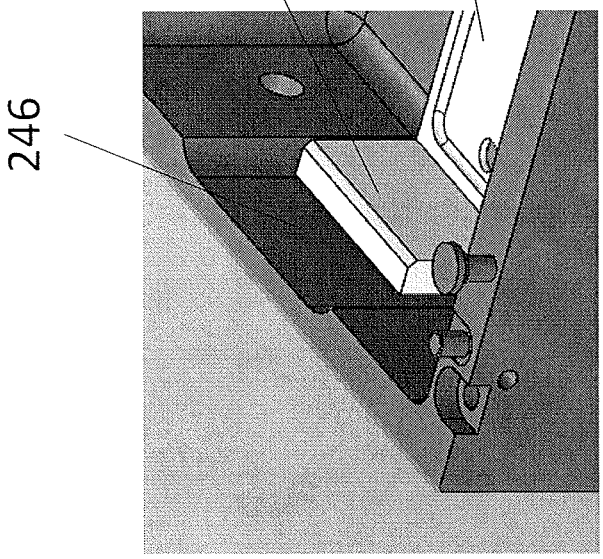


FIG. 17B

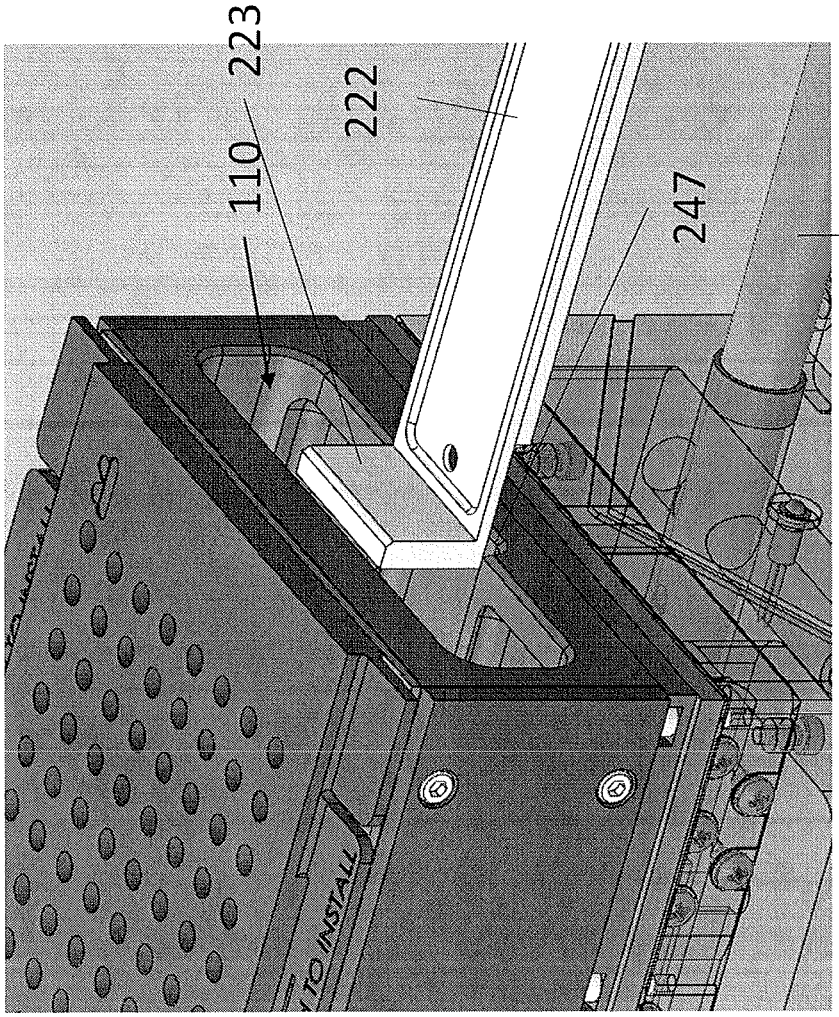


FIG. 17A

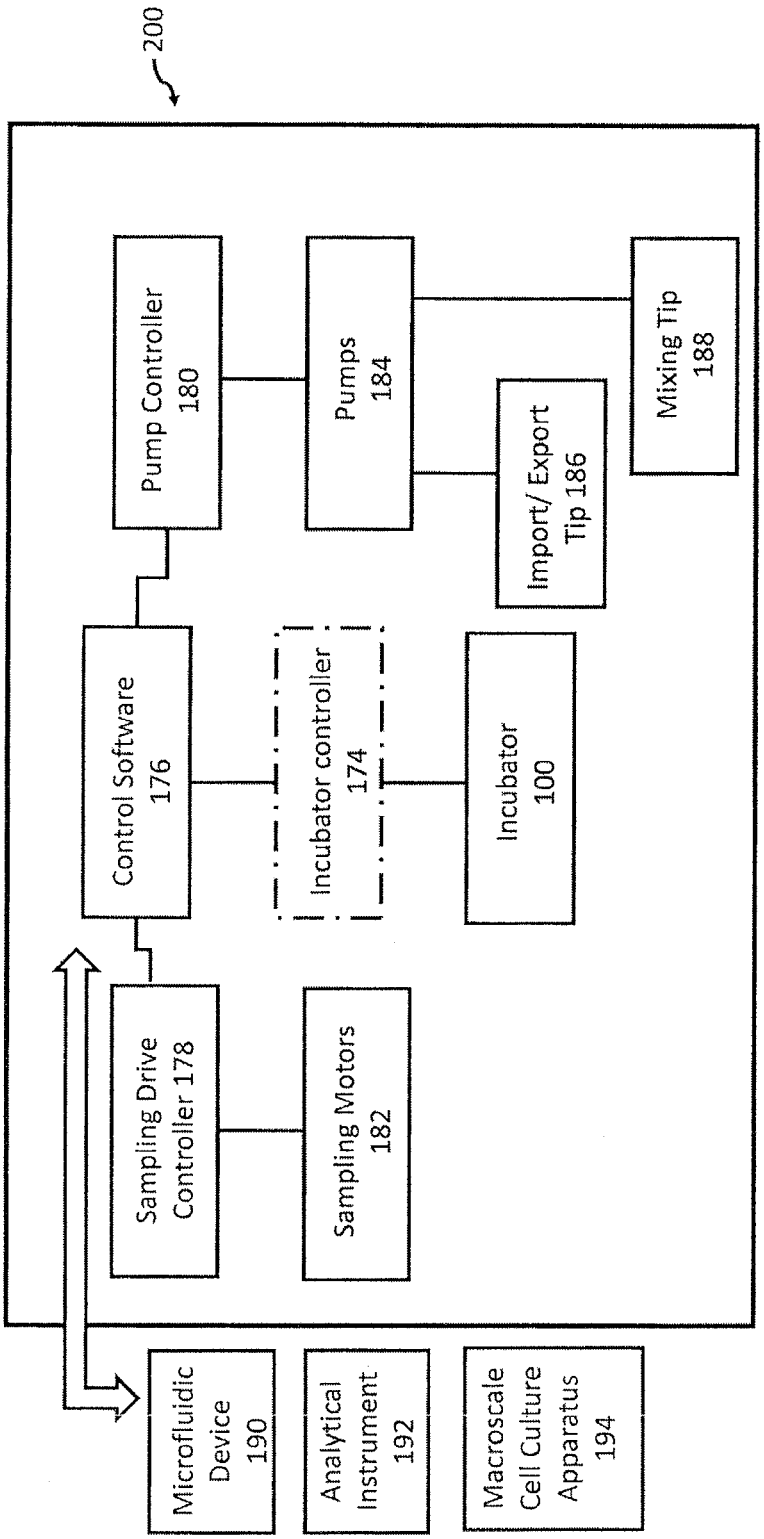

200
Pump Controller 180
Pumps 184
Mixing Tip 188
Import/ Export Tip 186
Control Software 176
Incubator controller 174
Incubator 100
Sampling Drive Controller 178
Sampling Motors 182
Microfluidic Device 190
Analytical Instrument 192
Macroscale Cell Culture Apparatus 194

FIG. 18


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FIG. 19