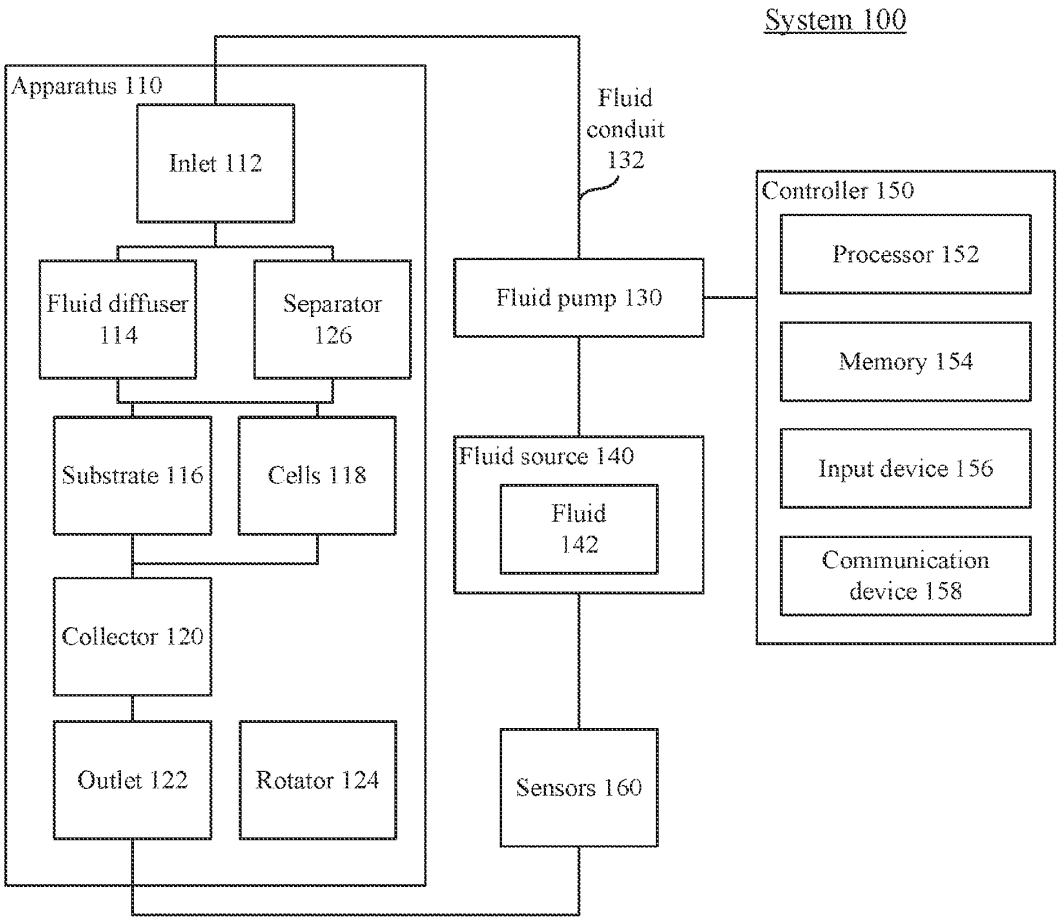

System 100
Apparatus 110
Inlet 112
Fluid diffuser 114
Separator 126
Substrate 116
Cells 118
Collector 120
Outlet 122
Rotator 124
Fluid conduit 132
Fluid pump 130
Fluid source 140
Fluid 142
Sensors 160
Controller 150
Processor 152
Memory 154
Input device 156
Communication device 158

FIG. 1

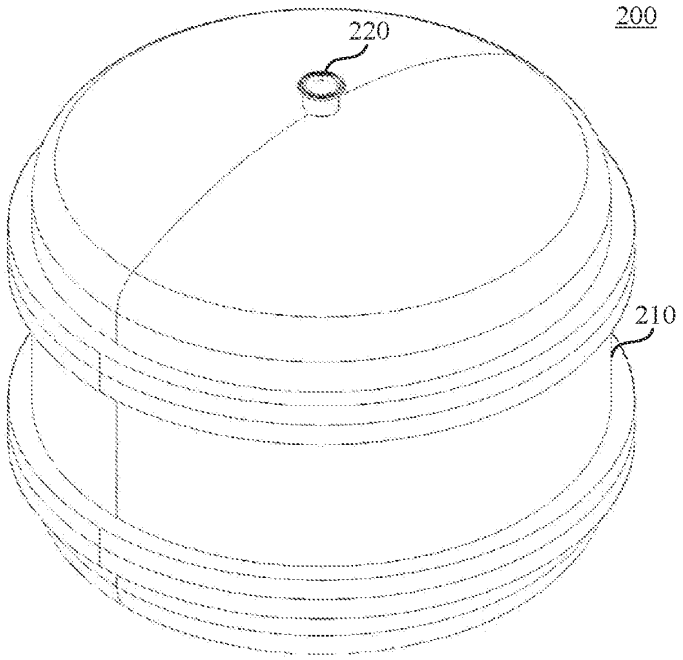


FIG. 2A

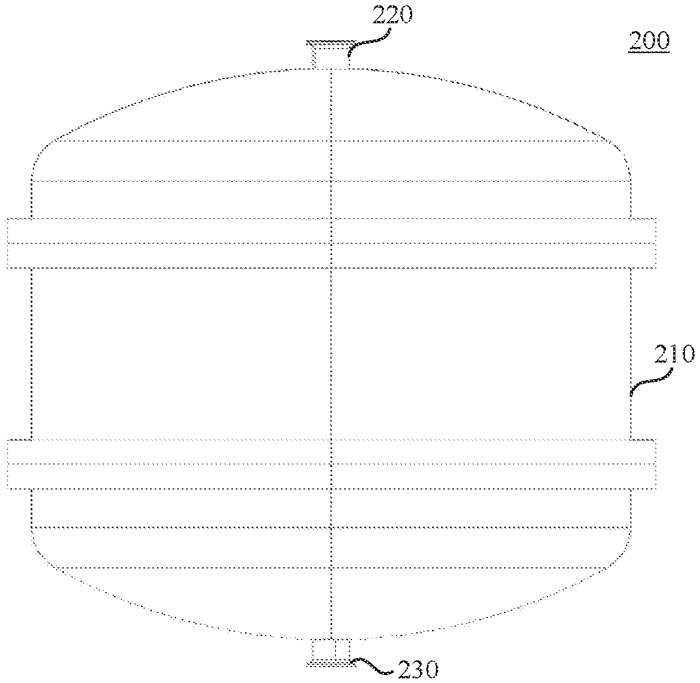


FIG. 2B

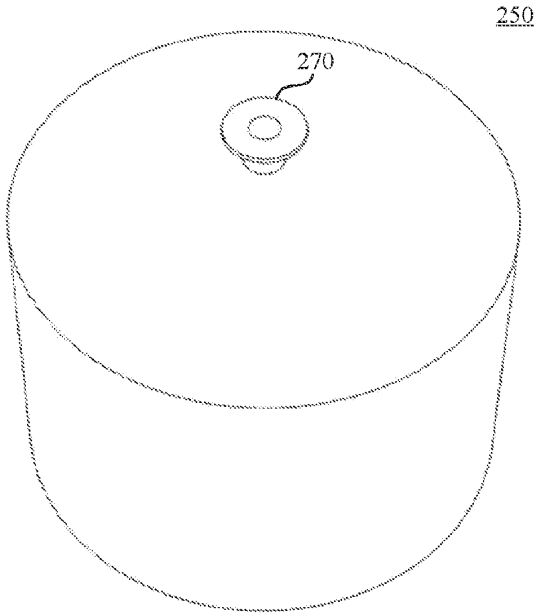


FIG. 2C

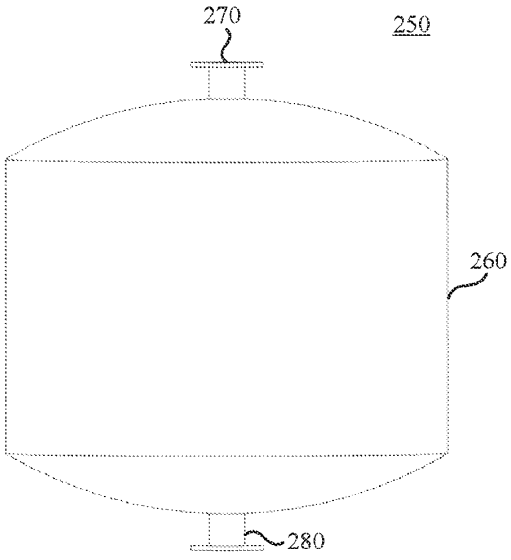


FIG. 2D

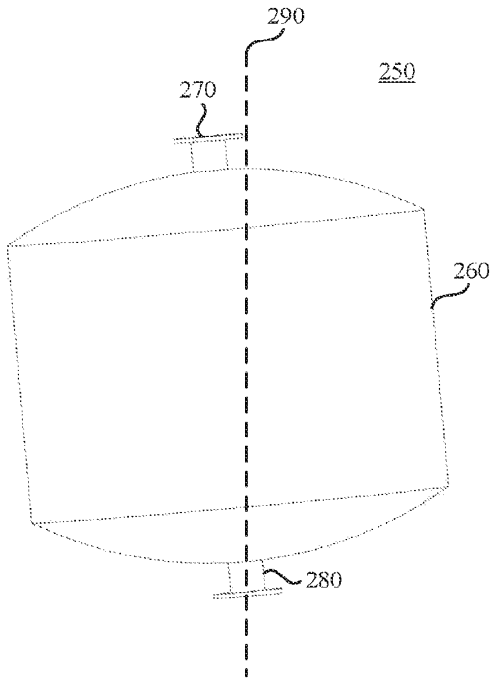


FIG. 2E

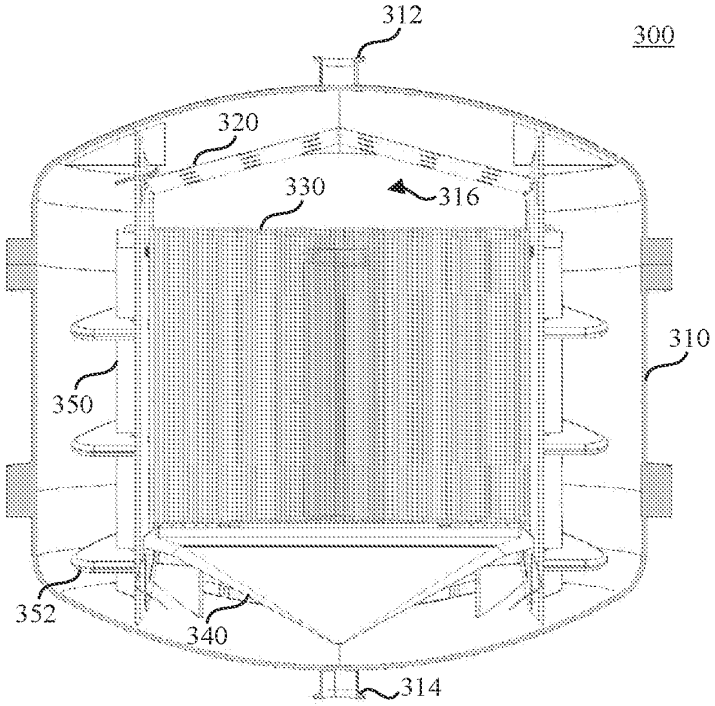


FIG. 3A

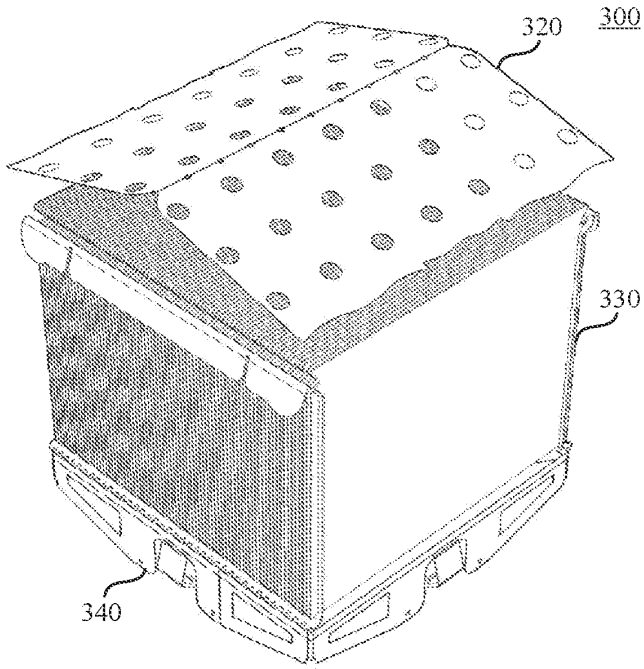


FIG. 3B

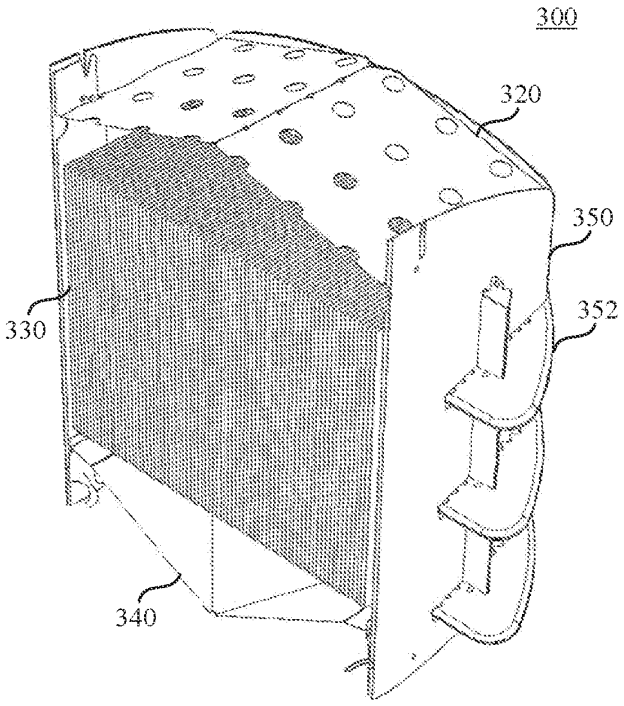


FIG. 3C

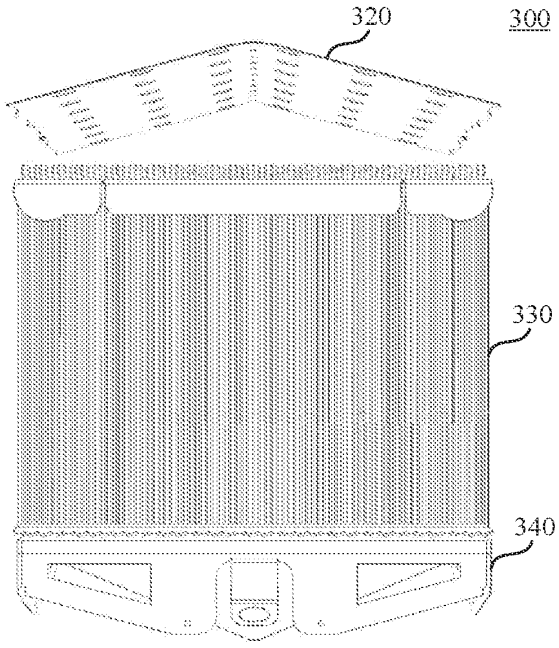


FIG. 3D

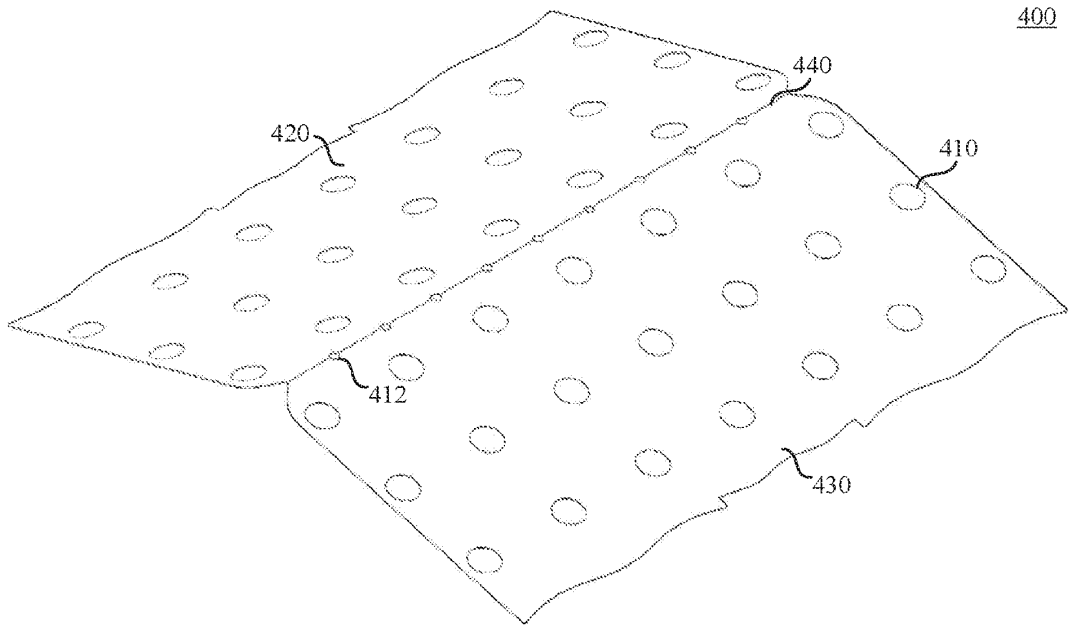


FIG. 4A

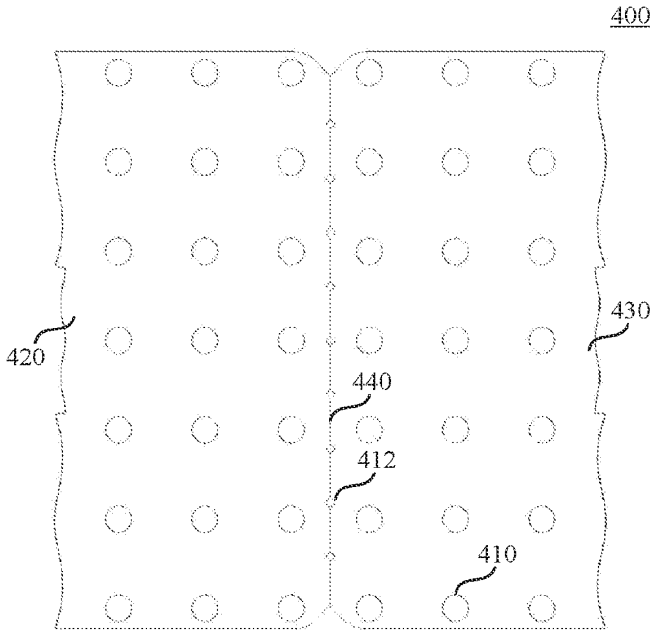


FIG. 4B

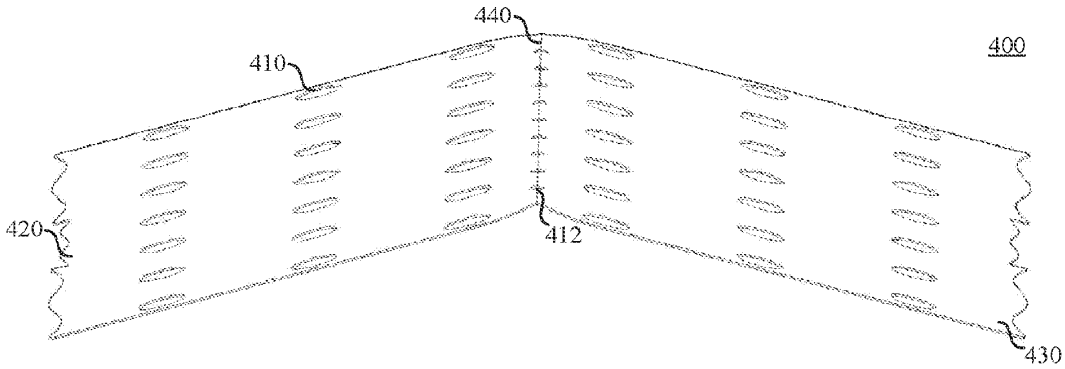


FIG. 4C

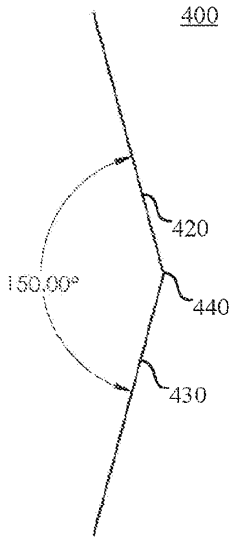


FIG. 4D

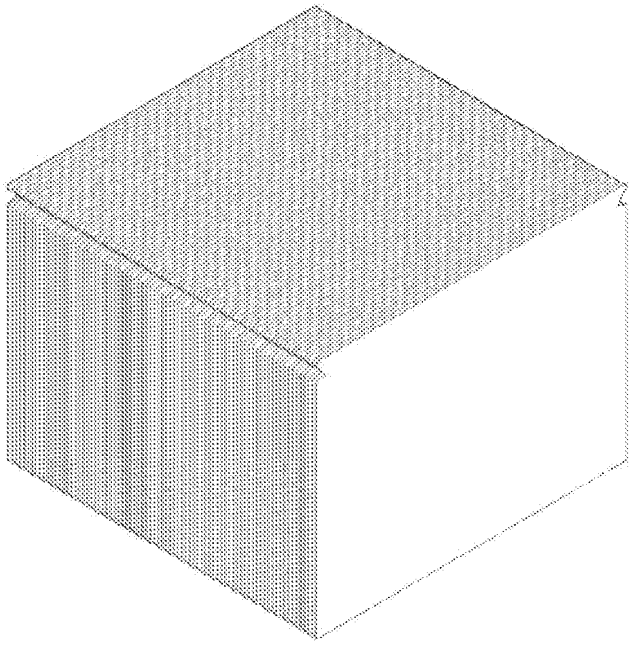


FIG. 5A

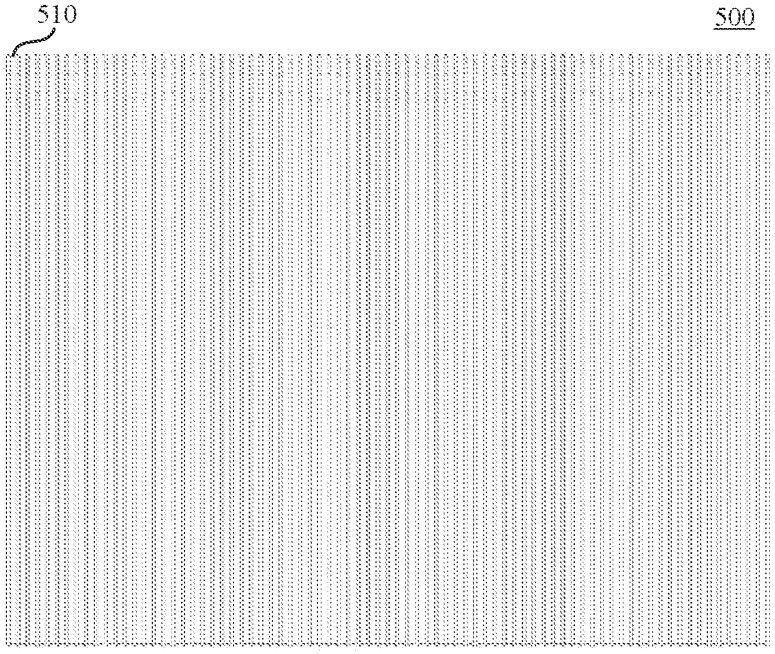


FIG. 5B

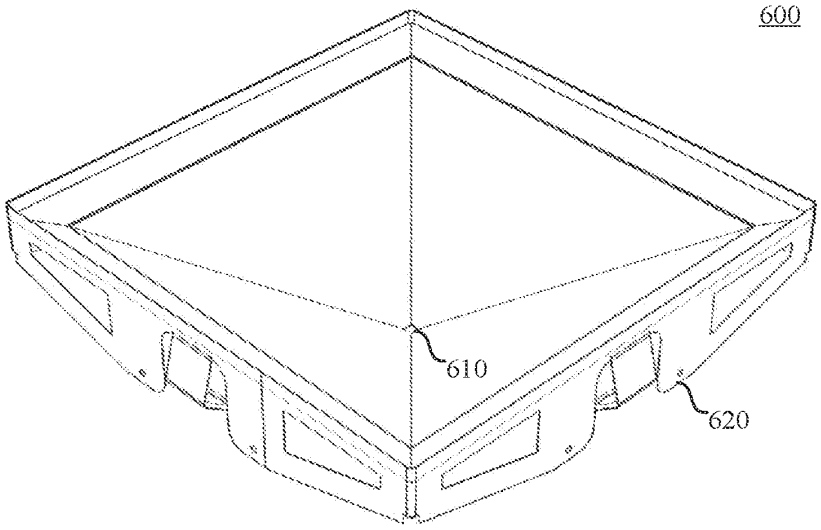


FIG. 6A

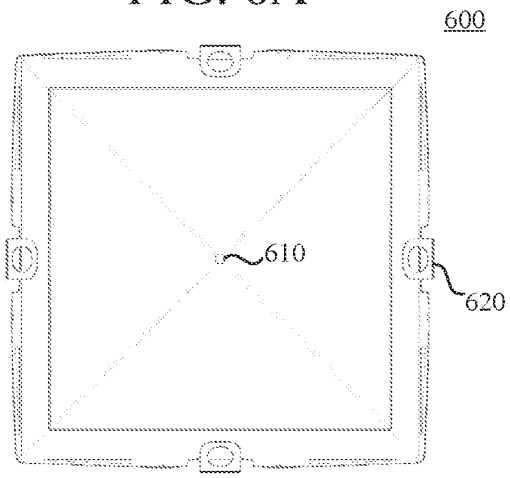


FIG. 6B

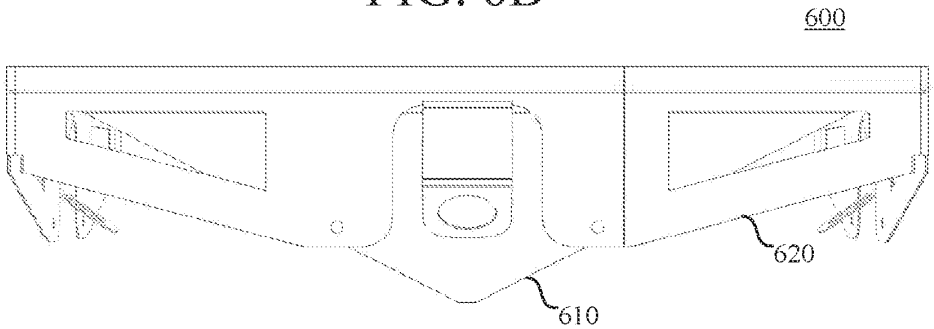


FIG. 6C

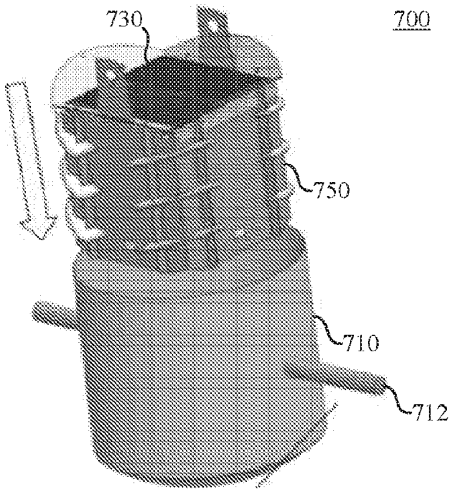


FIG. 7A

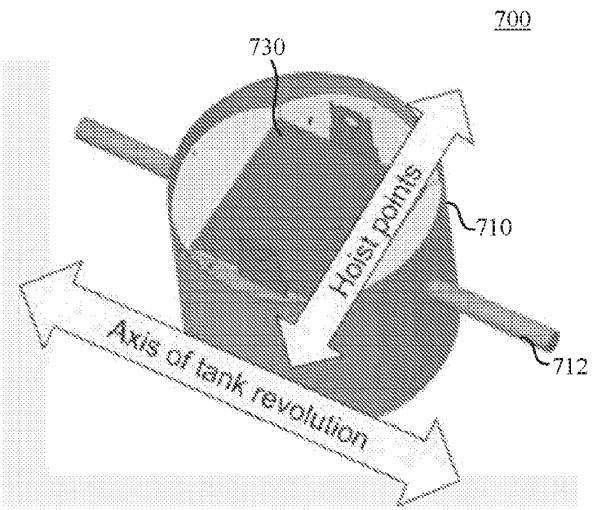


FIG. 7B

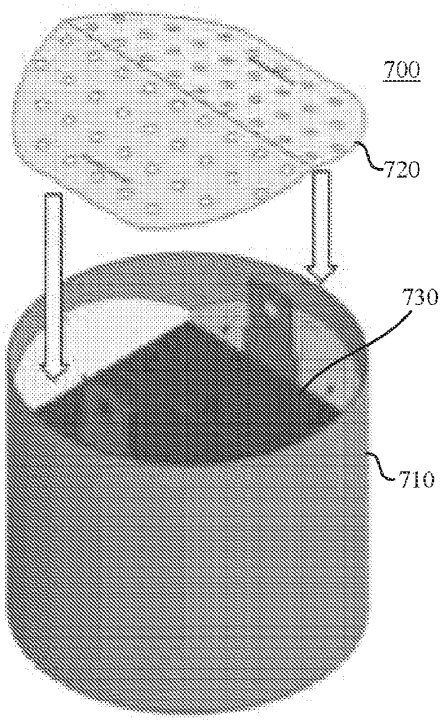


FIG. 7C

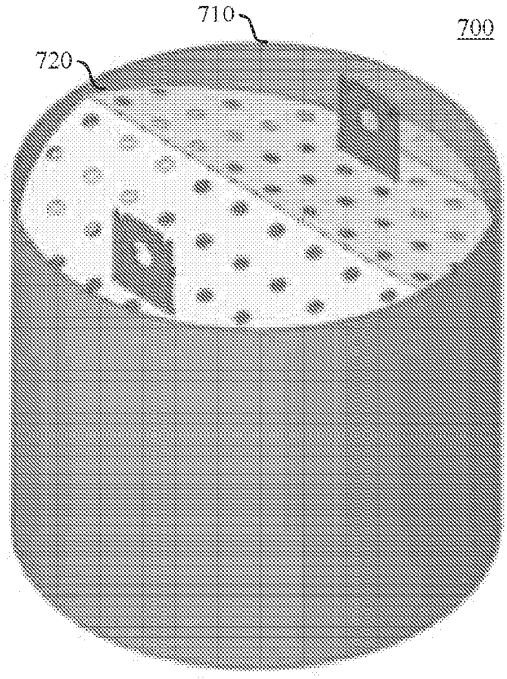


FIG. 7D

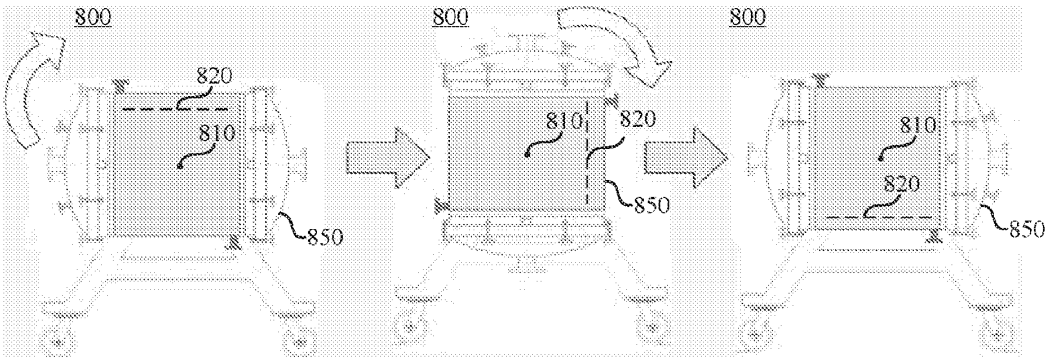


FIG. 8A FIG. 8B FIG. 8C

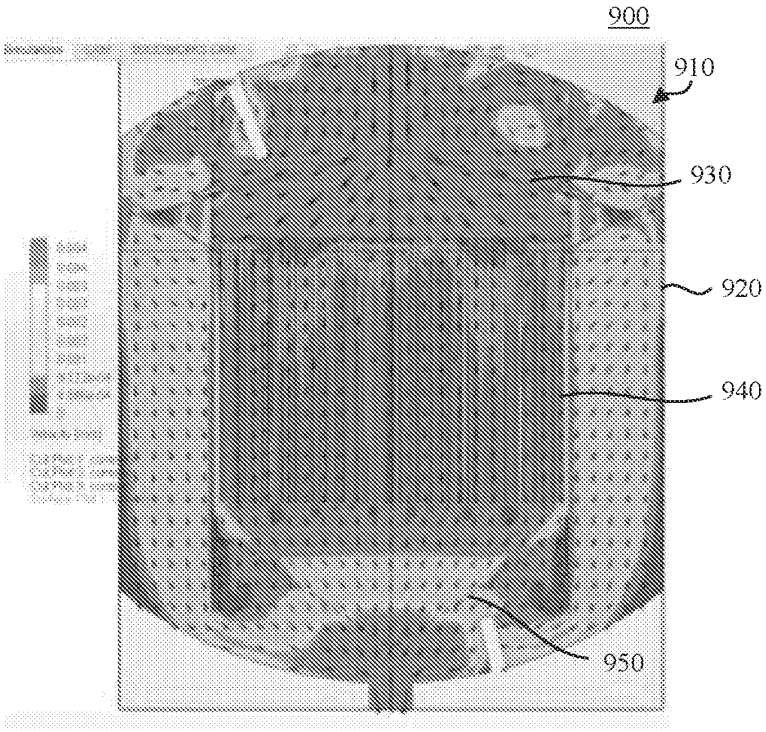


FIG. 9A

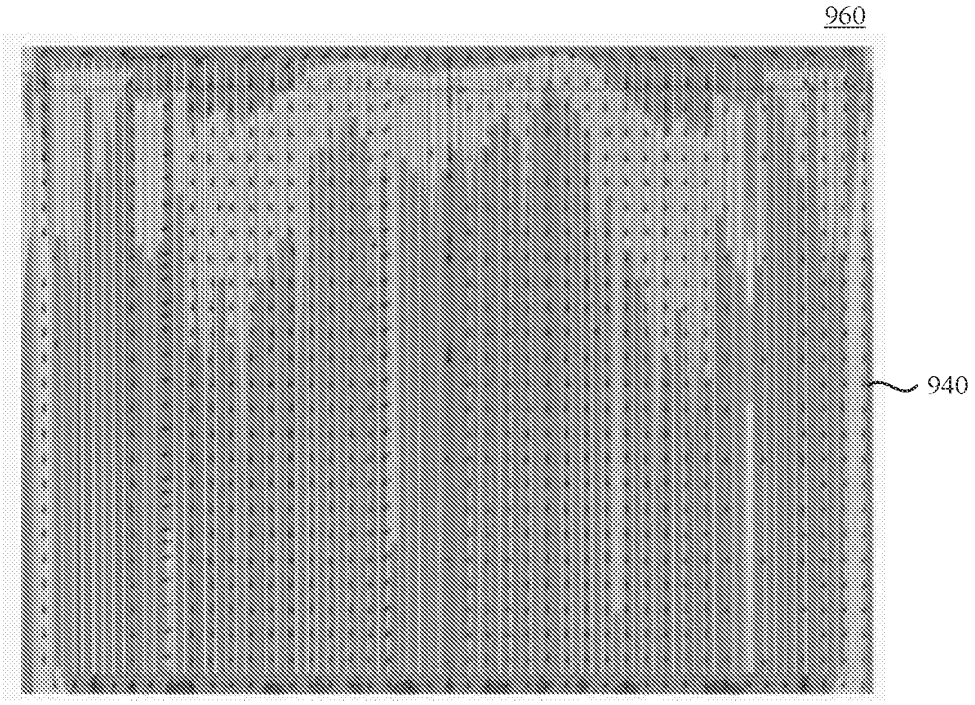


FIG. 9B

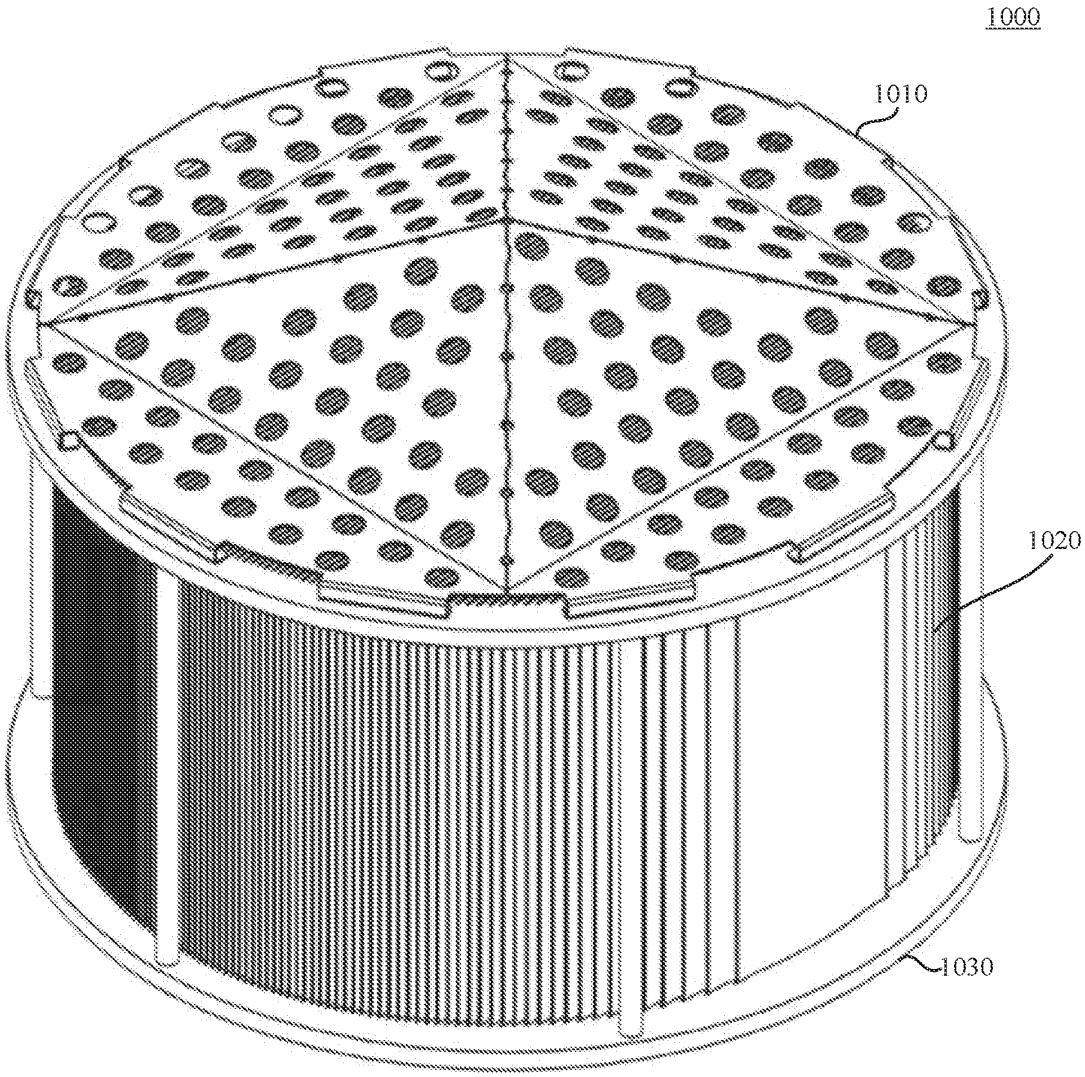


FIG. 10A

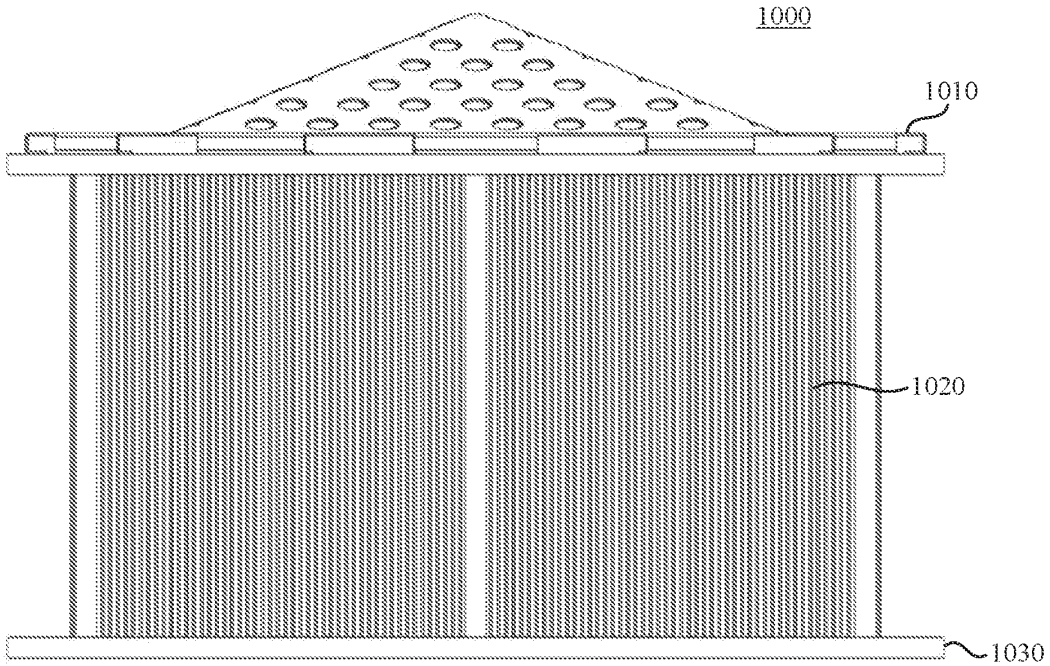


FIG. 10B

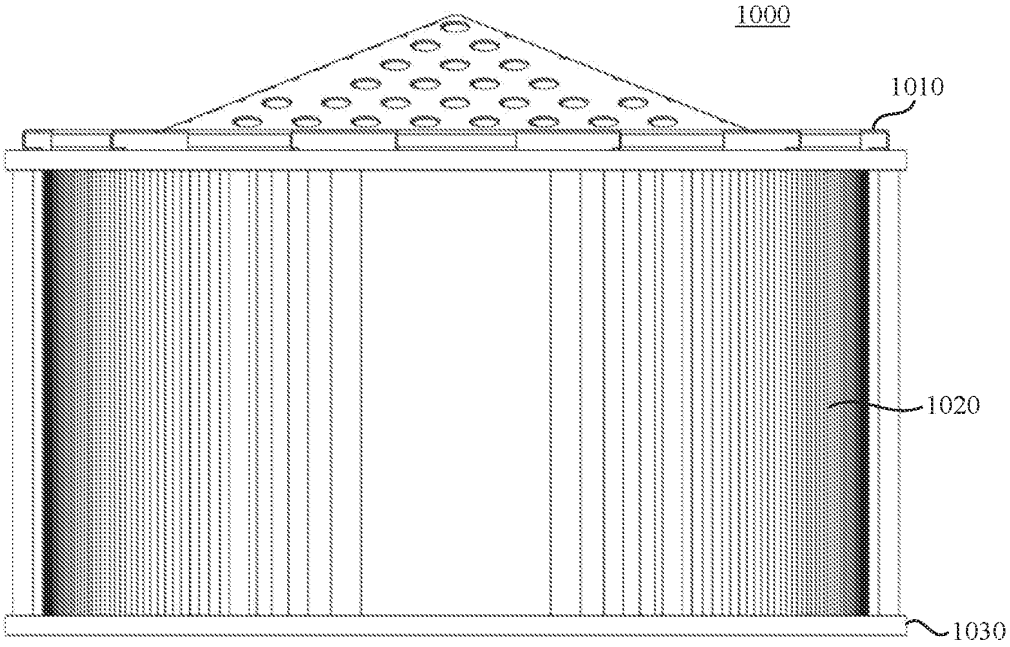


FIG. 10C

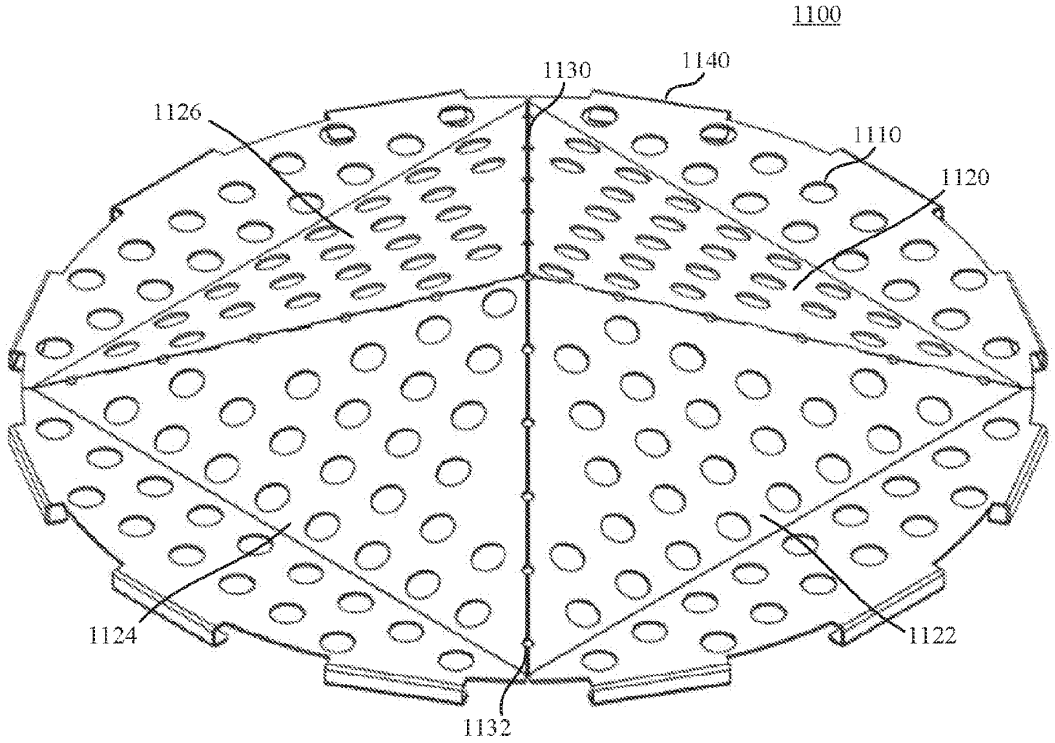


FIG. 11A

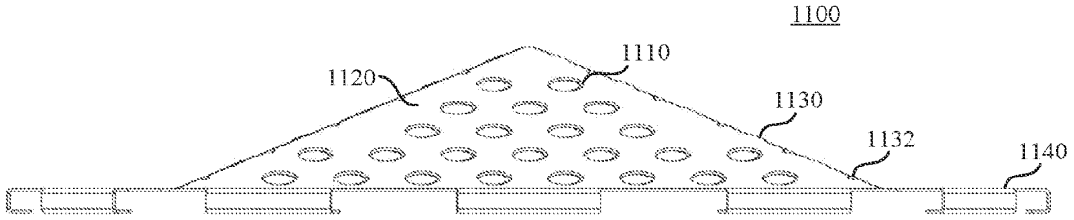


FIG. 11B

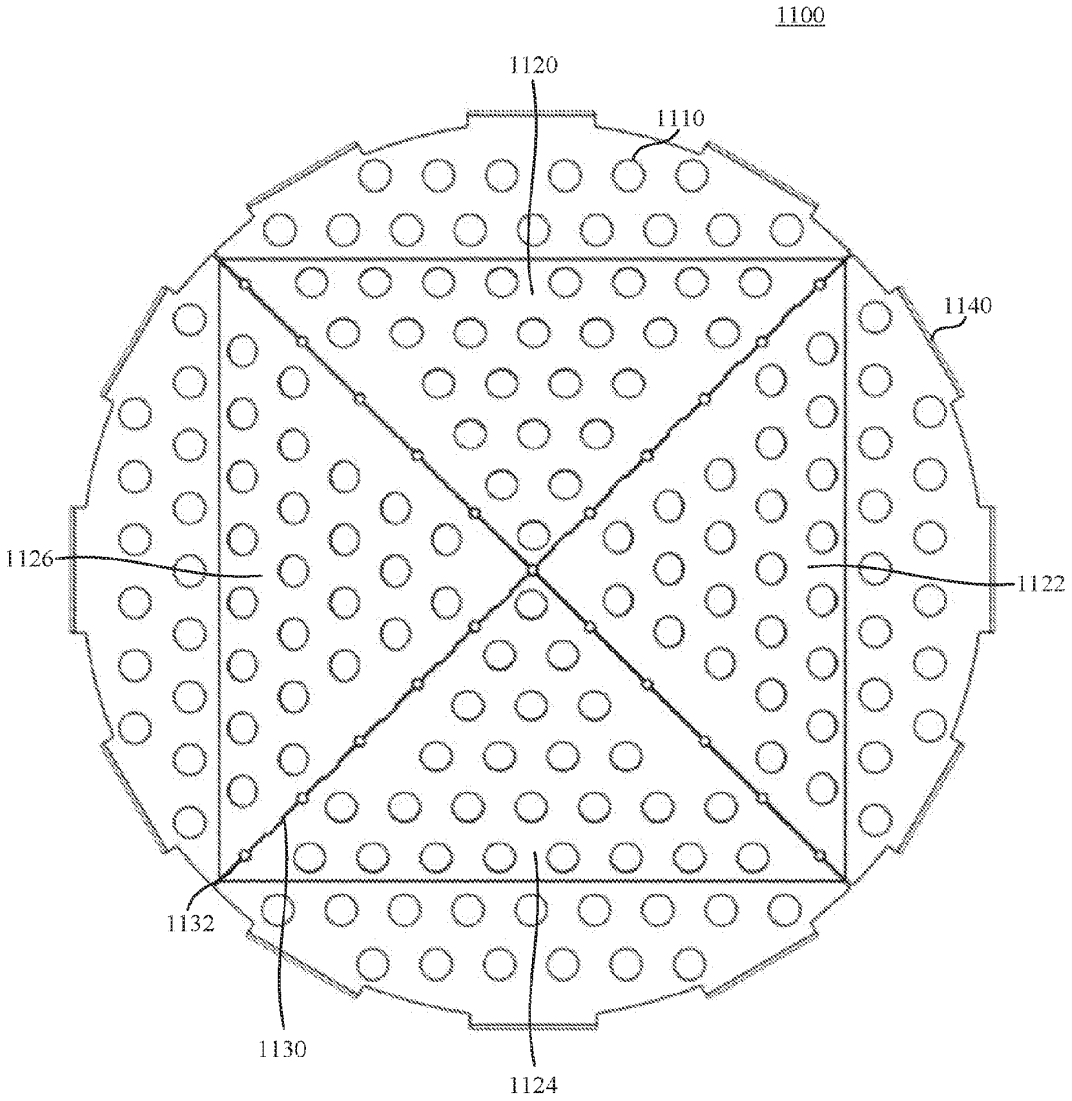


FIG. 11C

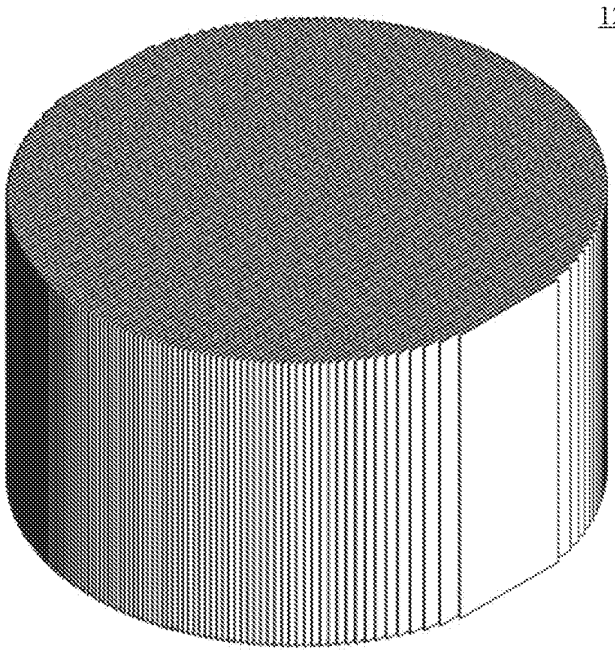


FIG. 12A

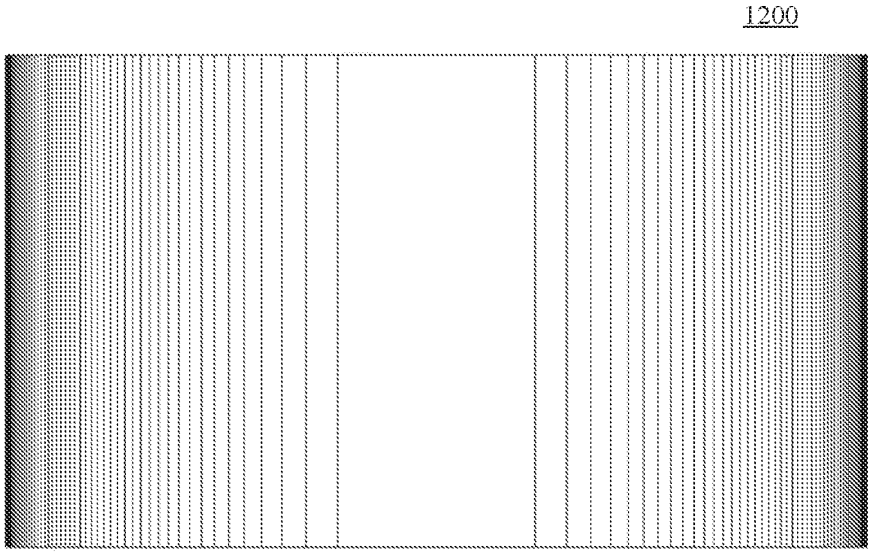


FIG. 12B

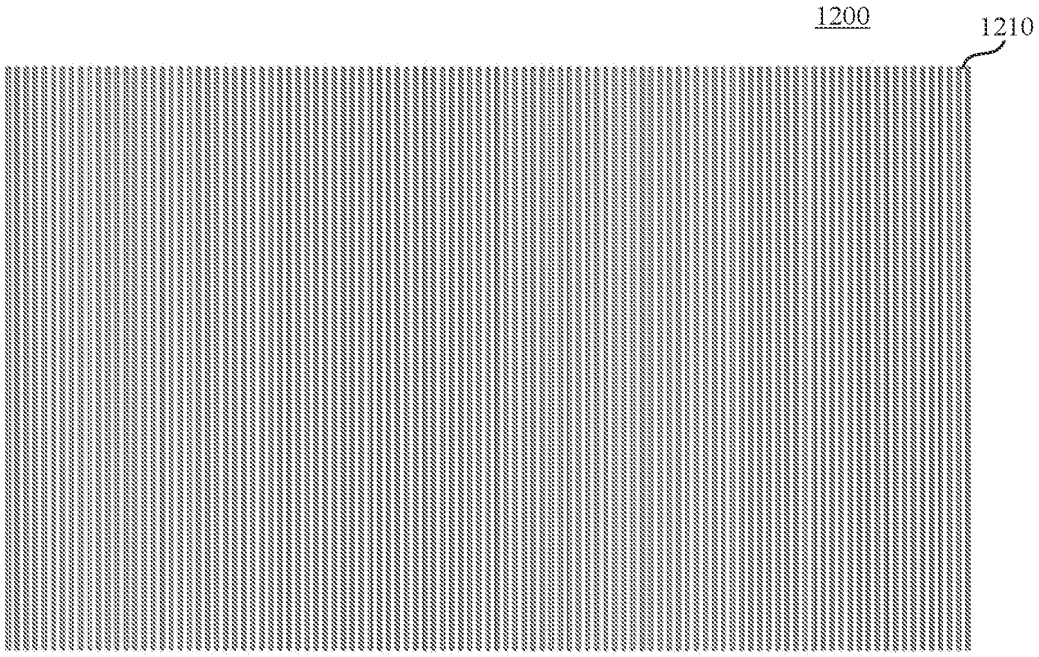


FIG. 12C

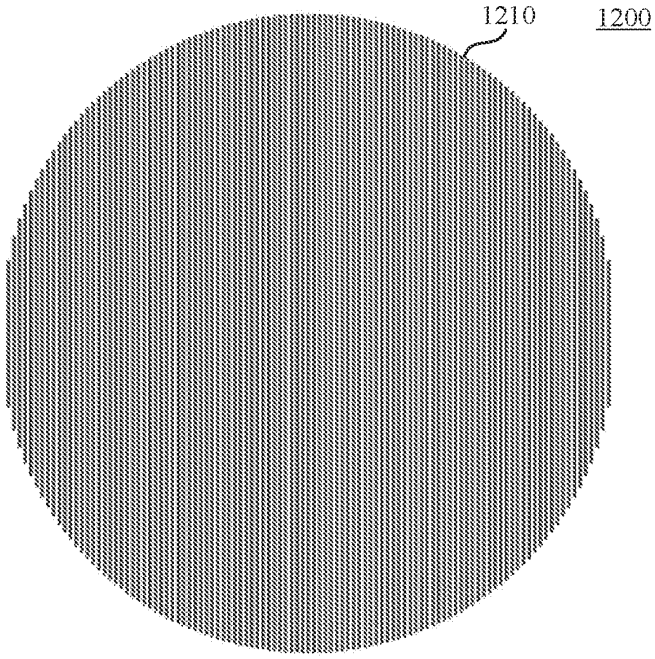


FIG. 12D

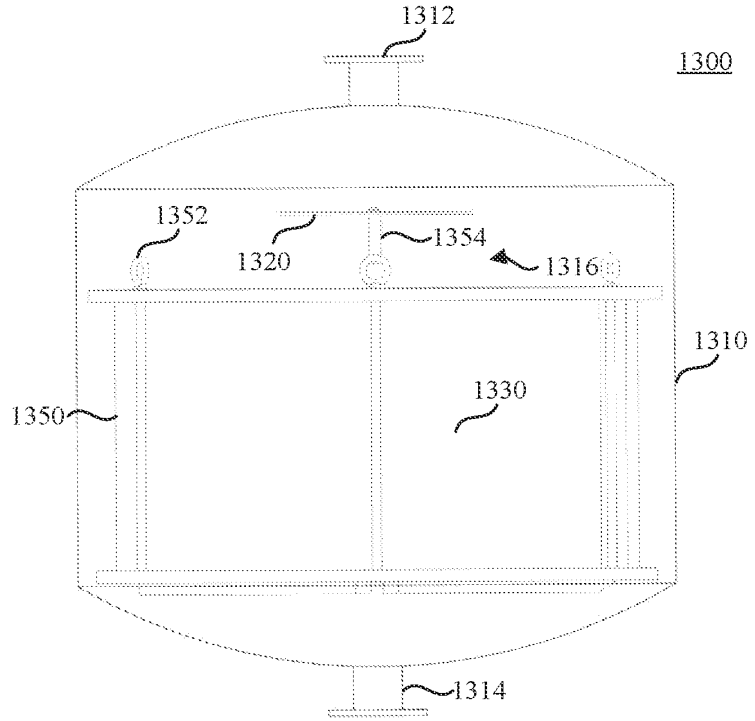


FIG. 13A

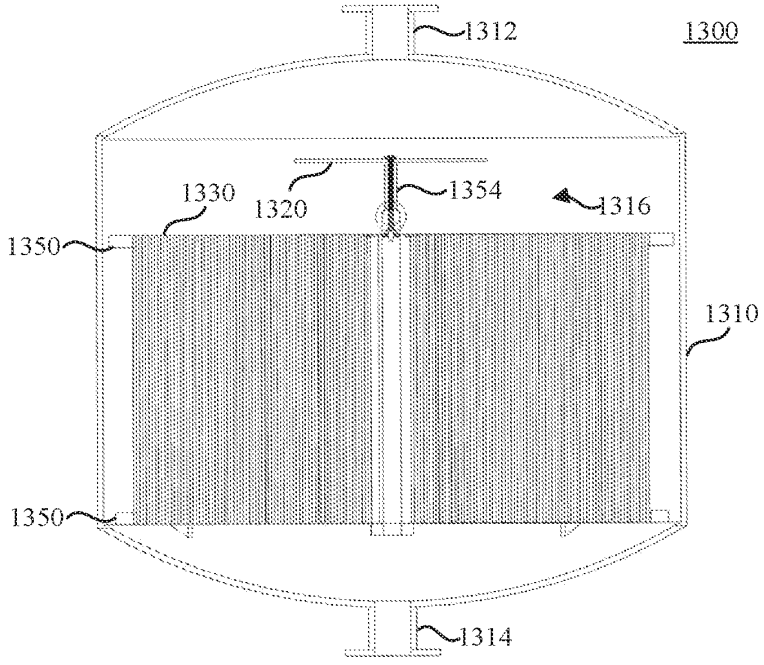


FIG. 13B

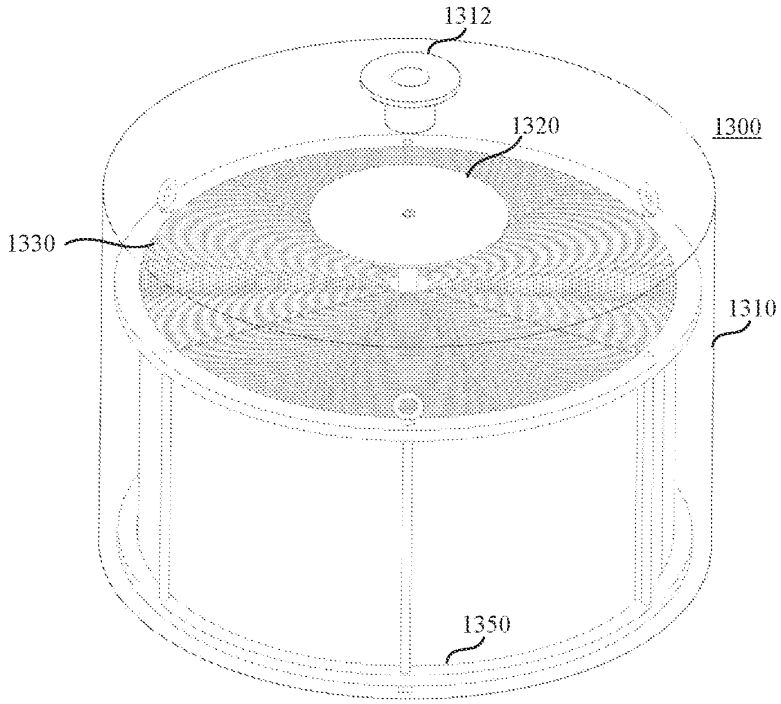


FIG. 13C

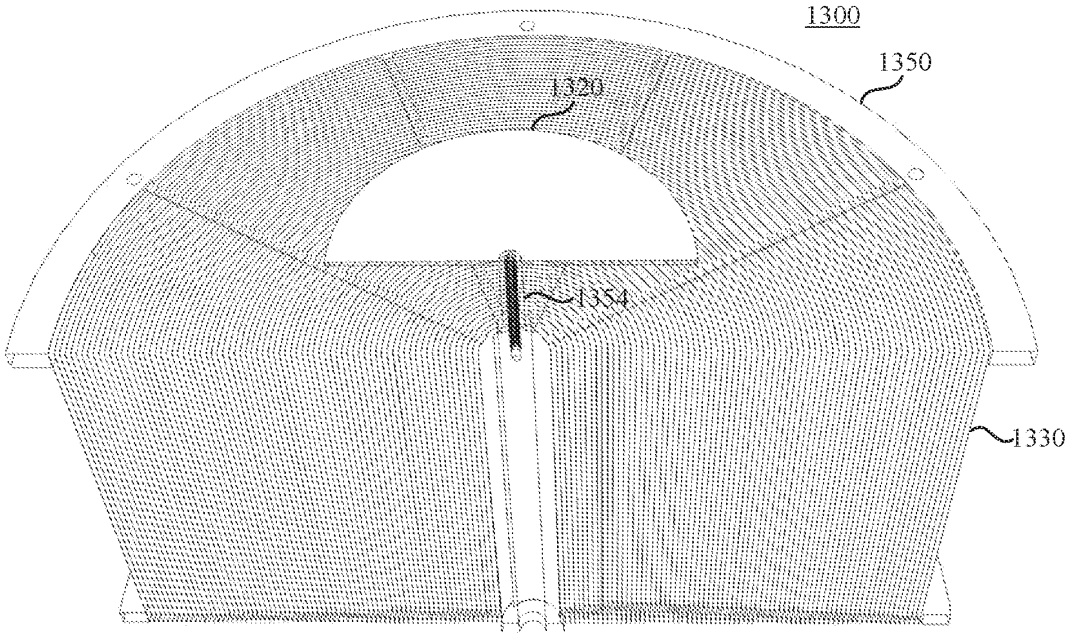


FIG. 13D

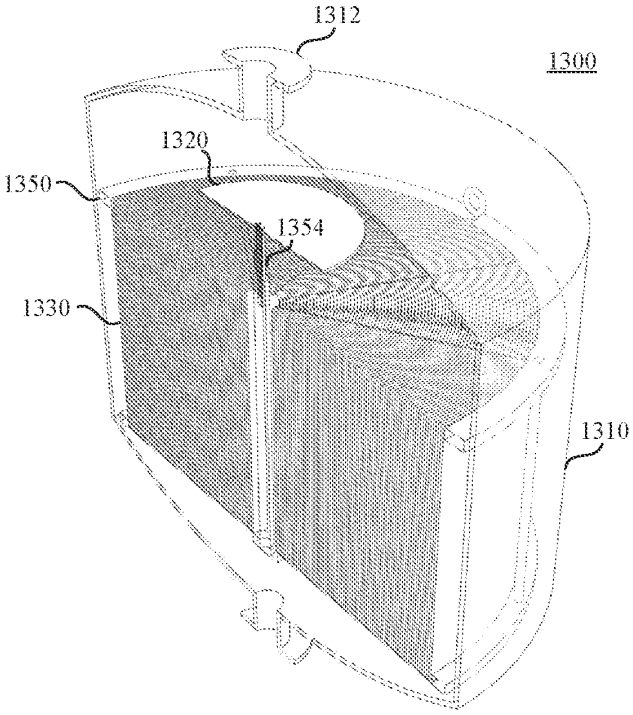


FIG. 13E

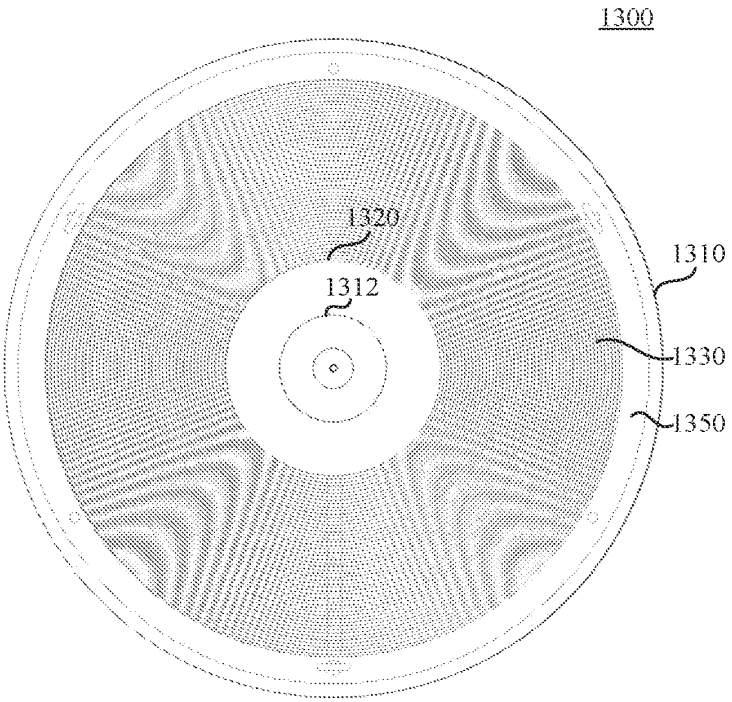


FIG. 13F

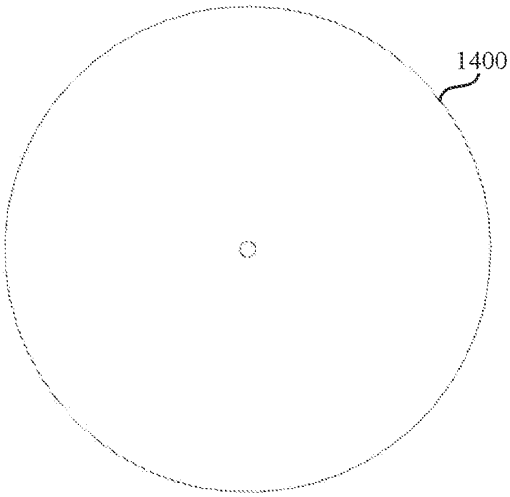


FIG. 14A

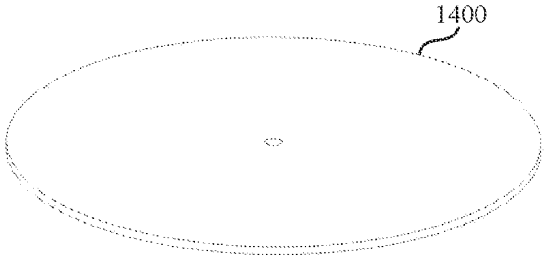


FIG. 14B

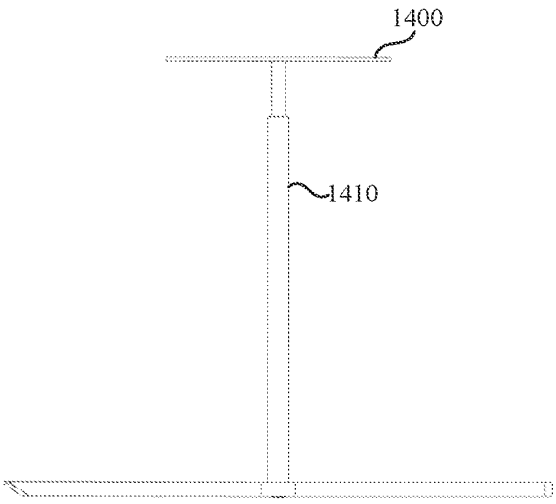


FIG. 14C

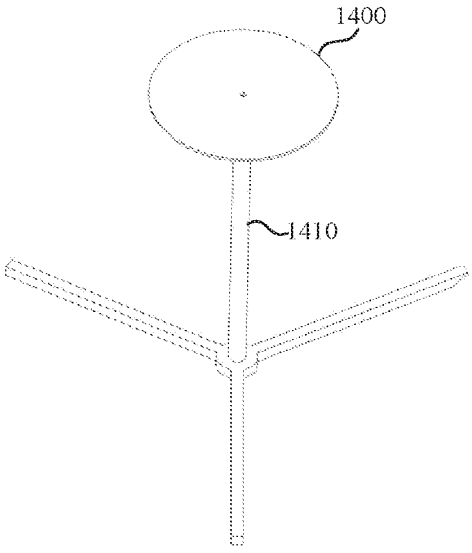


FIG. 14D

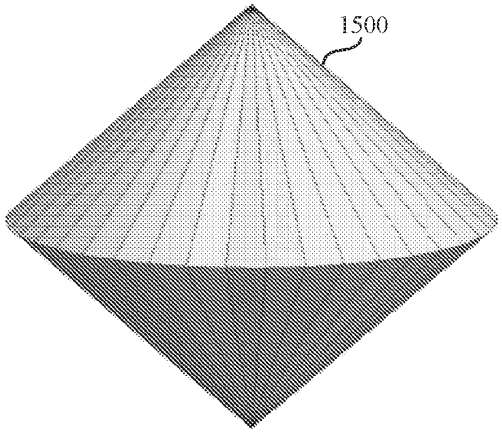


FIG. 15A

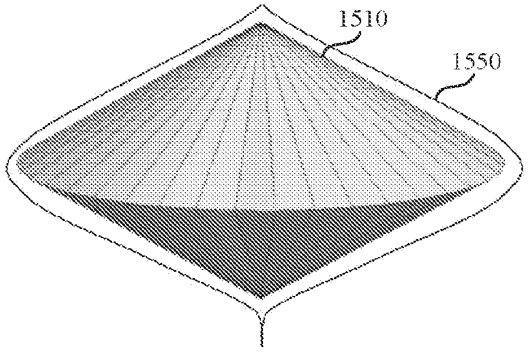


FIG. 15B

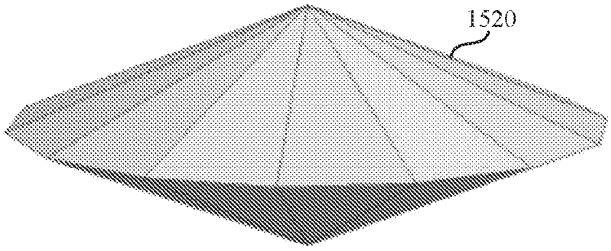


FIG. 15C

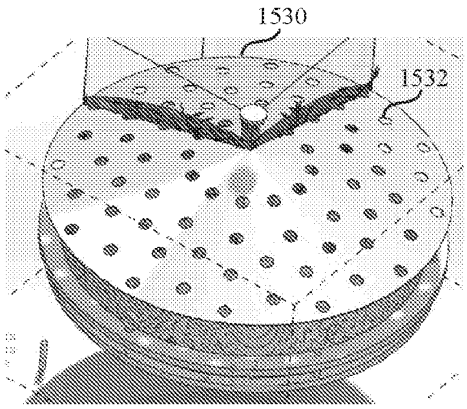


FIG. 15D

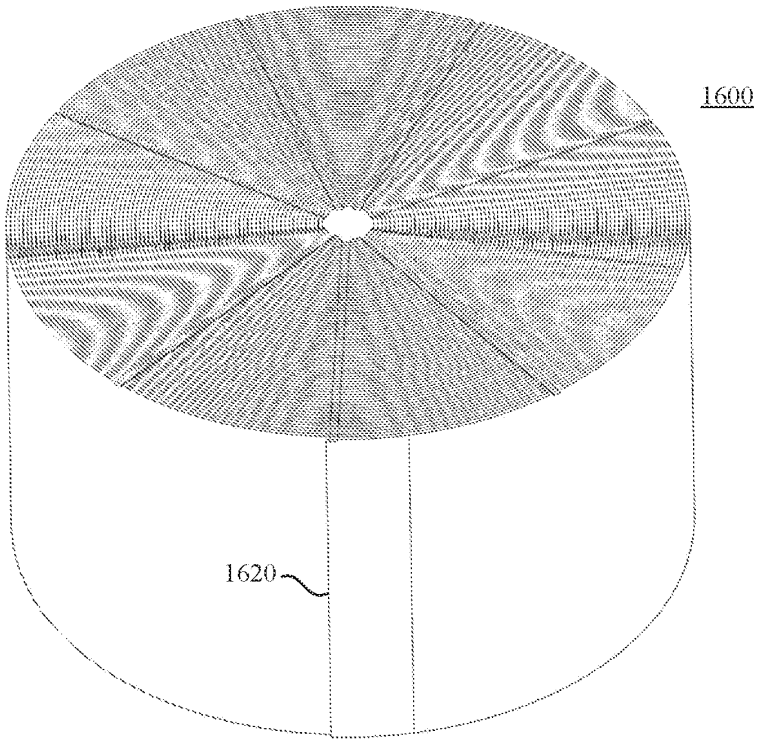


FIG. 16A

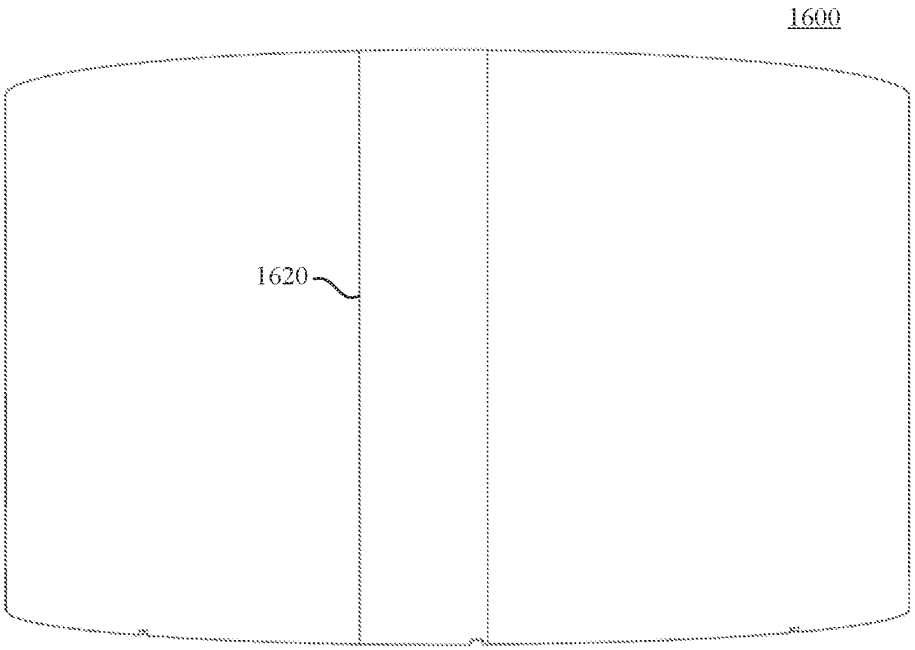


FIG. 16B

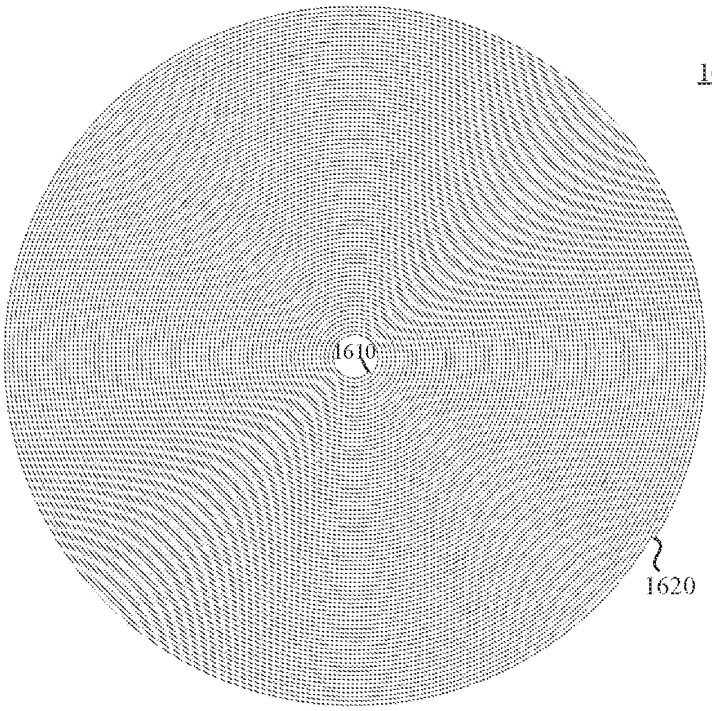


FIG. 16C

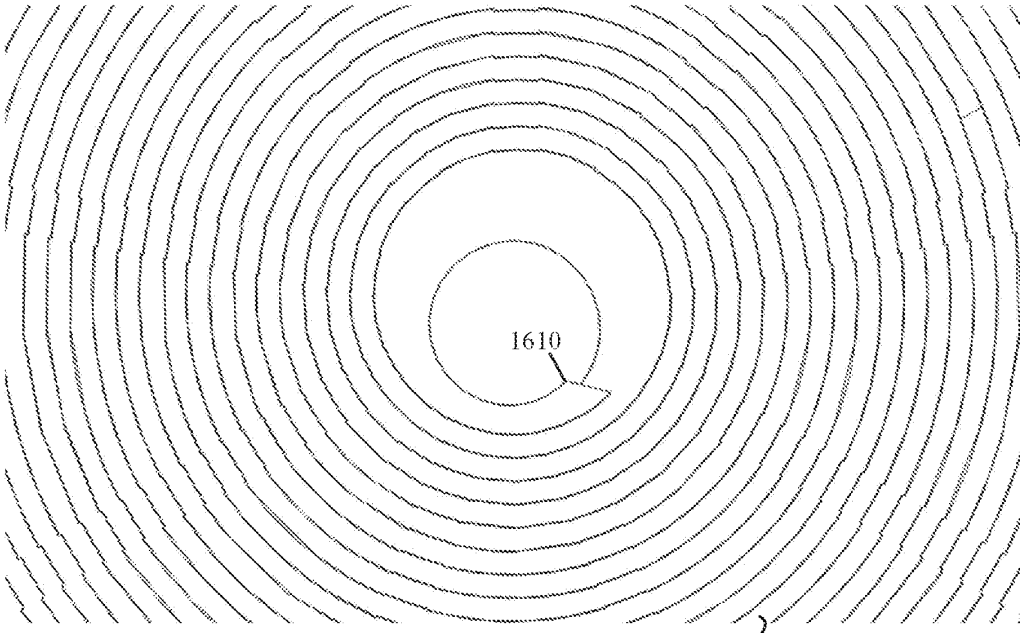


FIG. 16D

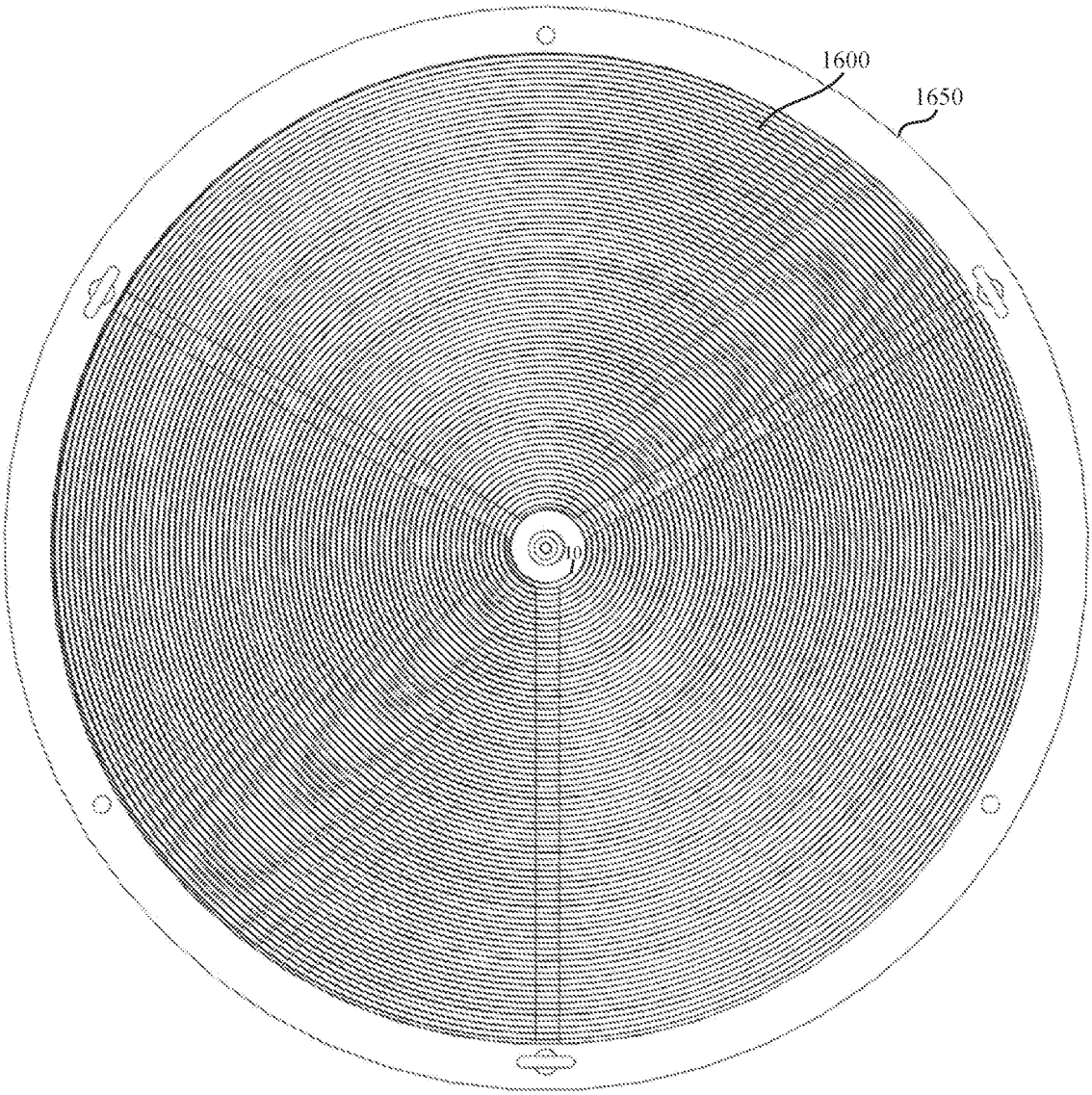


FIG. 16E

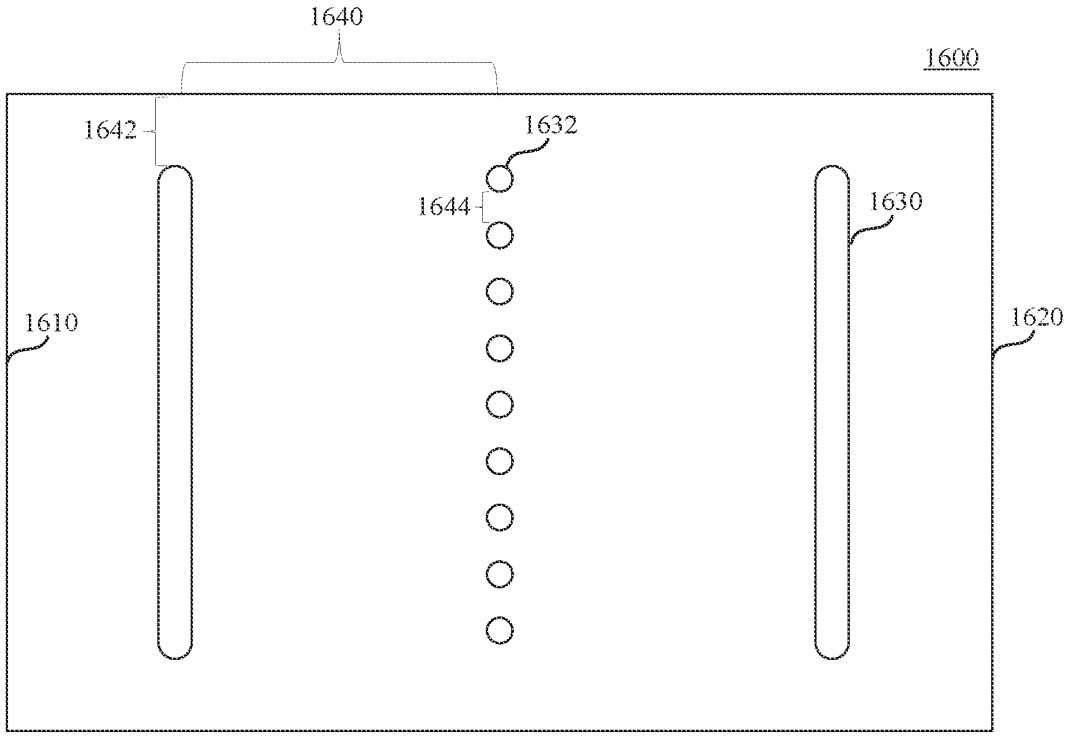


FIG. 16F

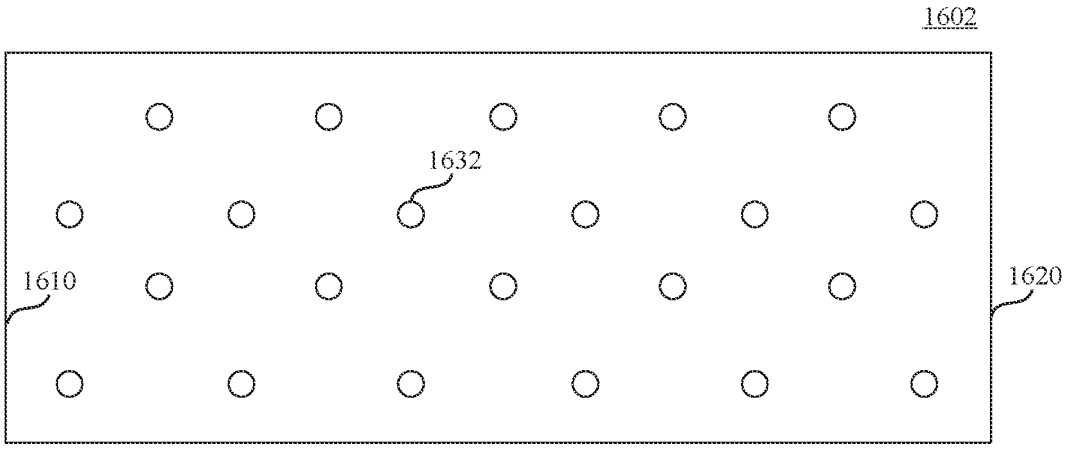


FIG. 16G

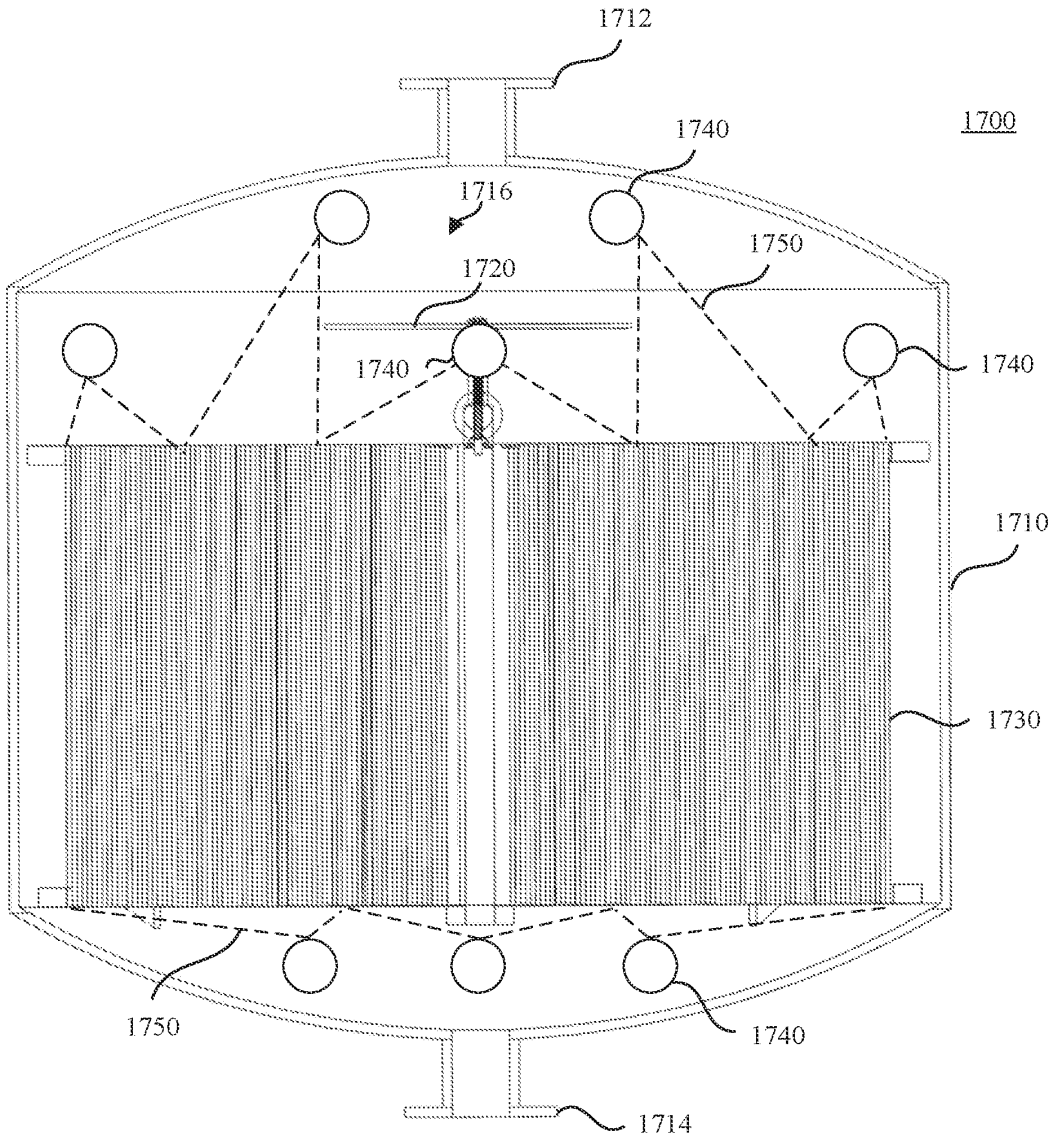

1712
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FIG. 17A

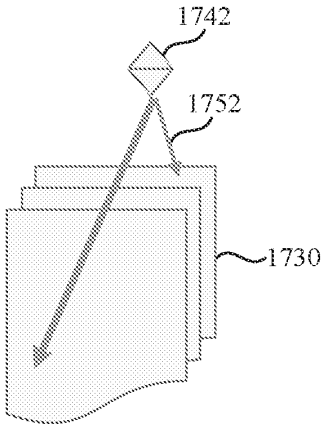


FIG. 17B

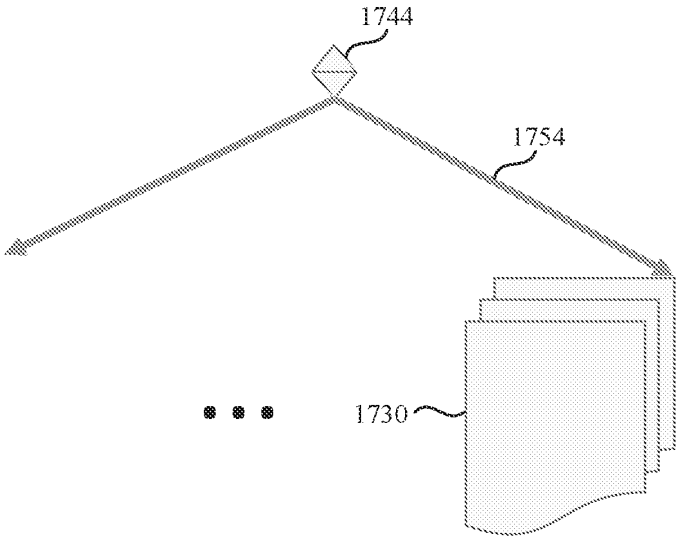


FIG. 17C

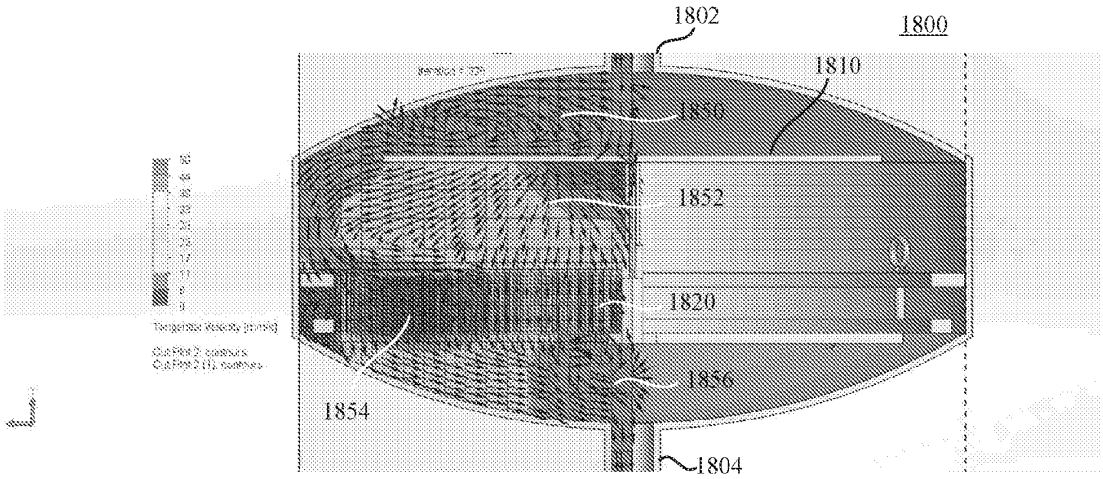


FIG. 18A

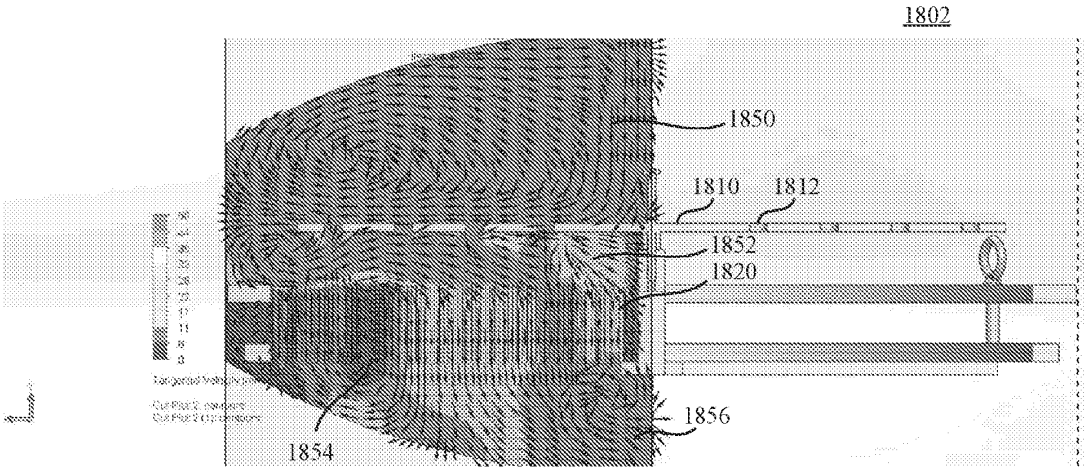


FIG. 18B

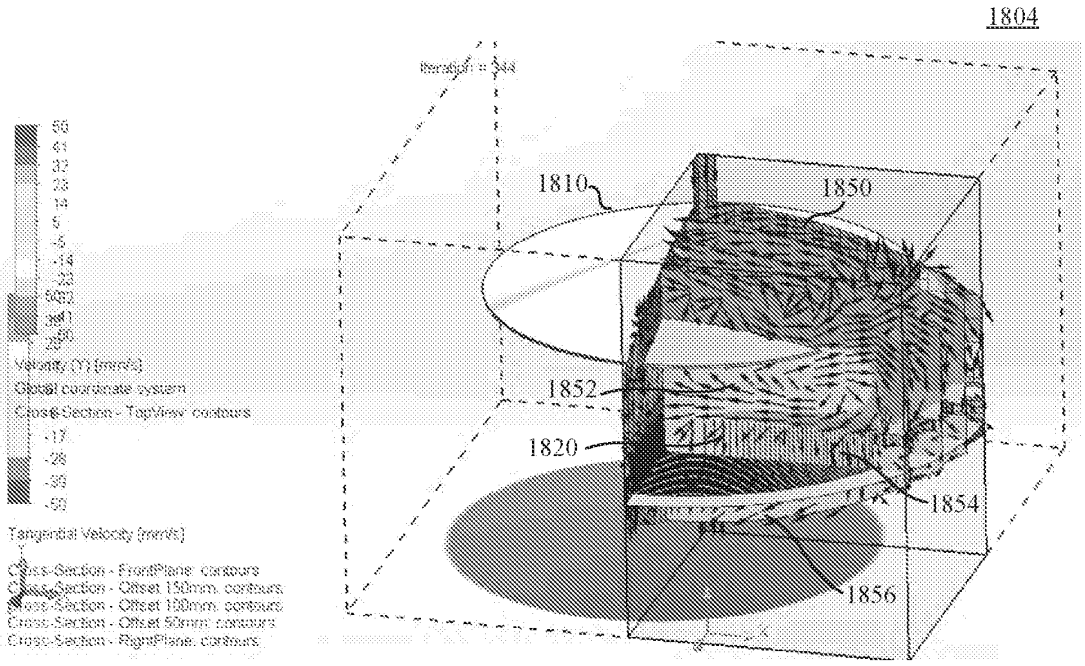


FIG. 18C

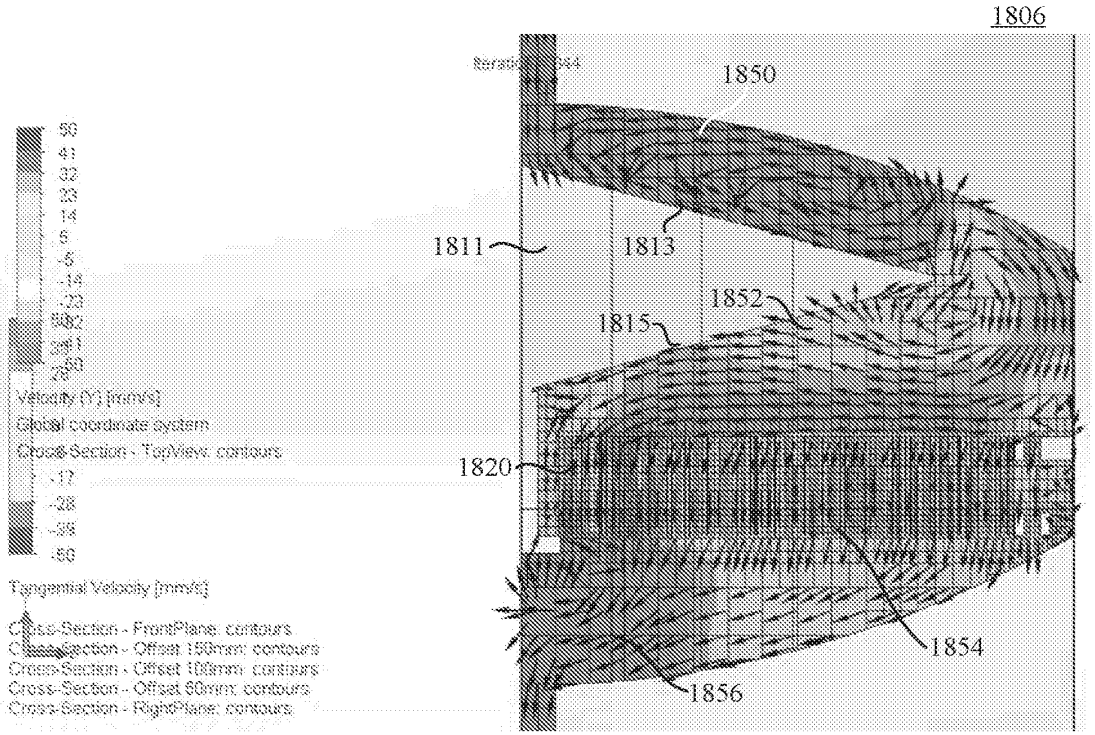


FIG. 18D

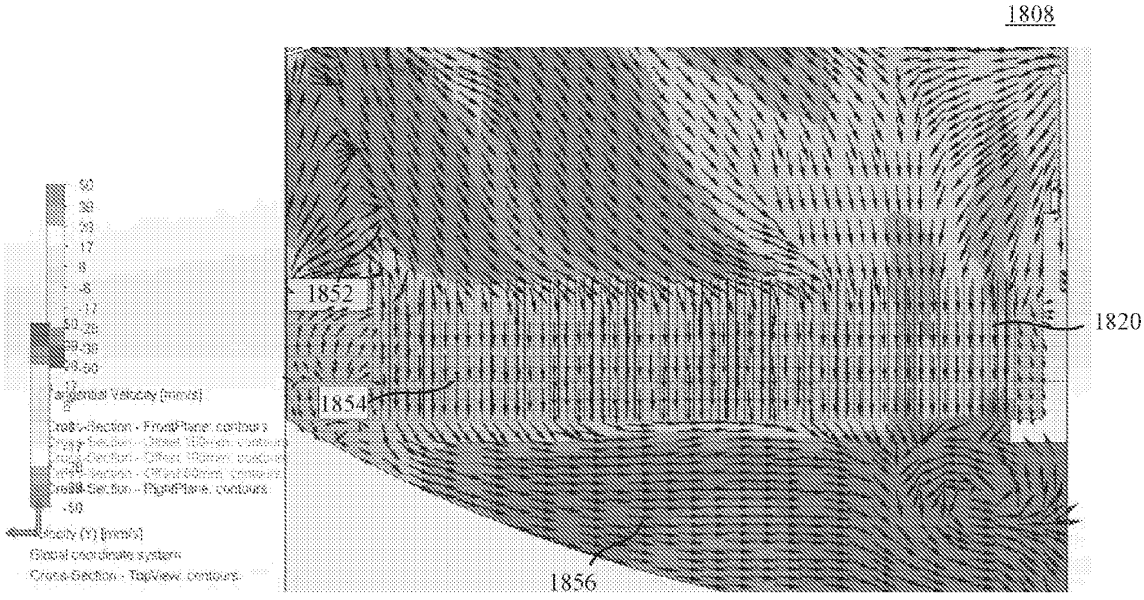


FIG. 18E

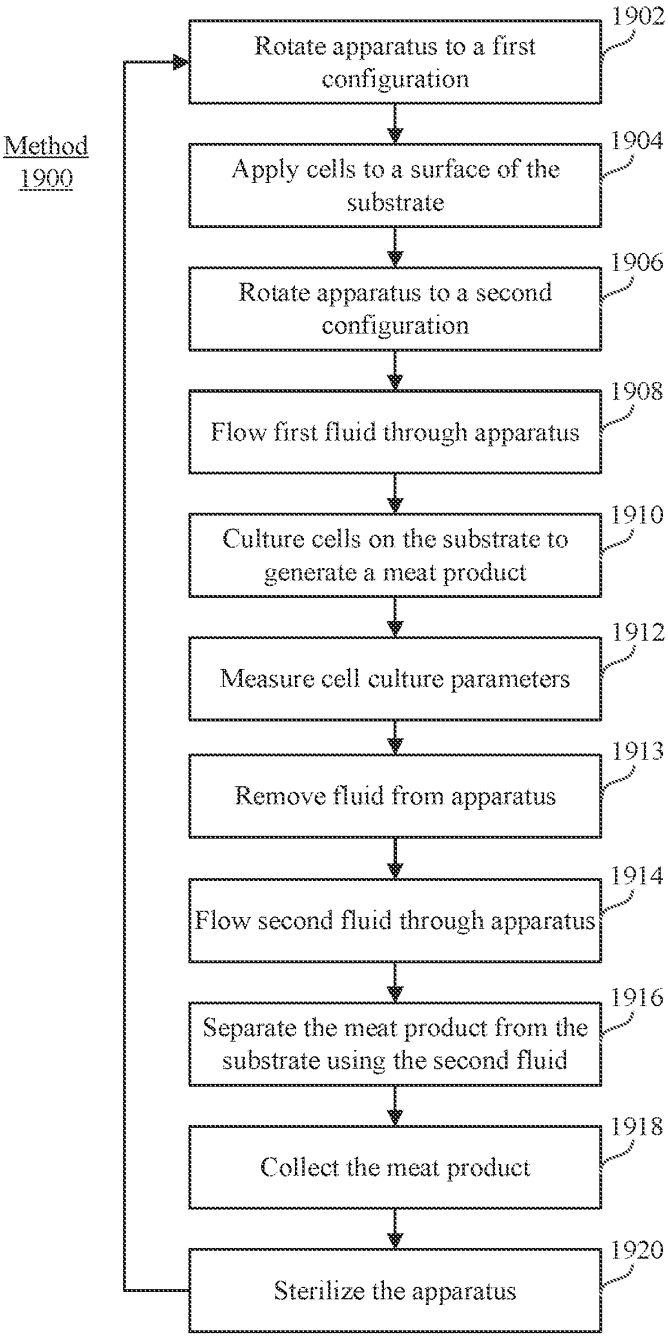

Method 1900
Rotate apparatus to a first configuration
1902
Apply cells to a surface of the substrate
1904
Rotate apparatus to a second configuration
1906
Flow first fluid through apparatus
1908
Culture cells on the substrate to generate a meat product
1910
Measure cell culture parameters
1912
Remove fluid from apparatus
1913
Flow second fluid through apparatus
1914
Separate the meat product from the substrate using the second fluid
1916
Collect the meat product
1918
Sterilize the apparatus
1920

FIG. 19