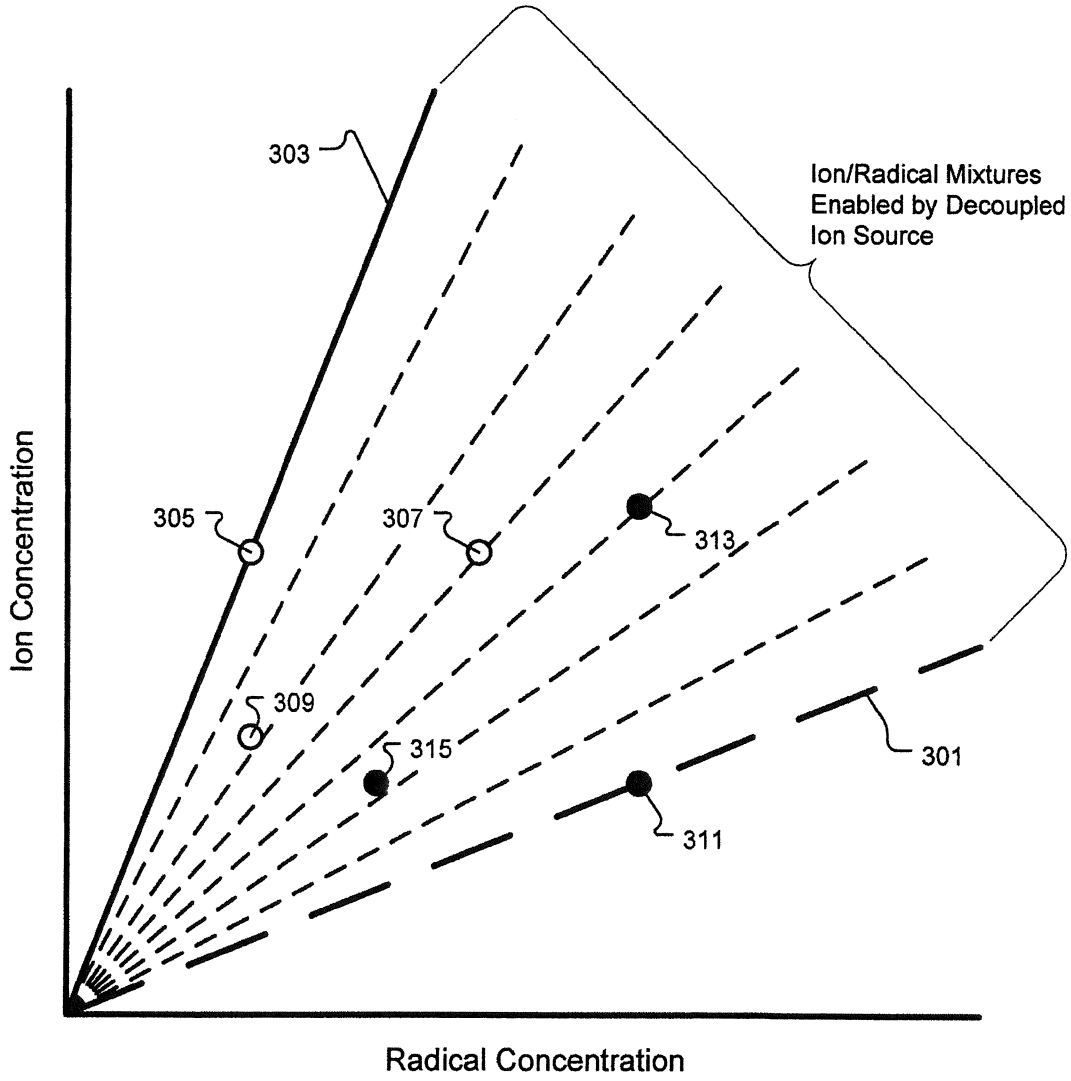

303
Ion/Radical Mixtures
Enabled by Decoupled
Ion Source
305
307
313
309
315
301
311
Ion Concentration
Radical Concentration

Fig. 1

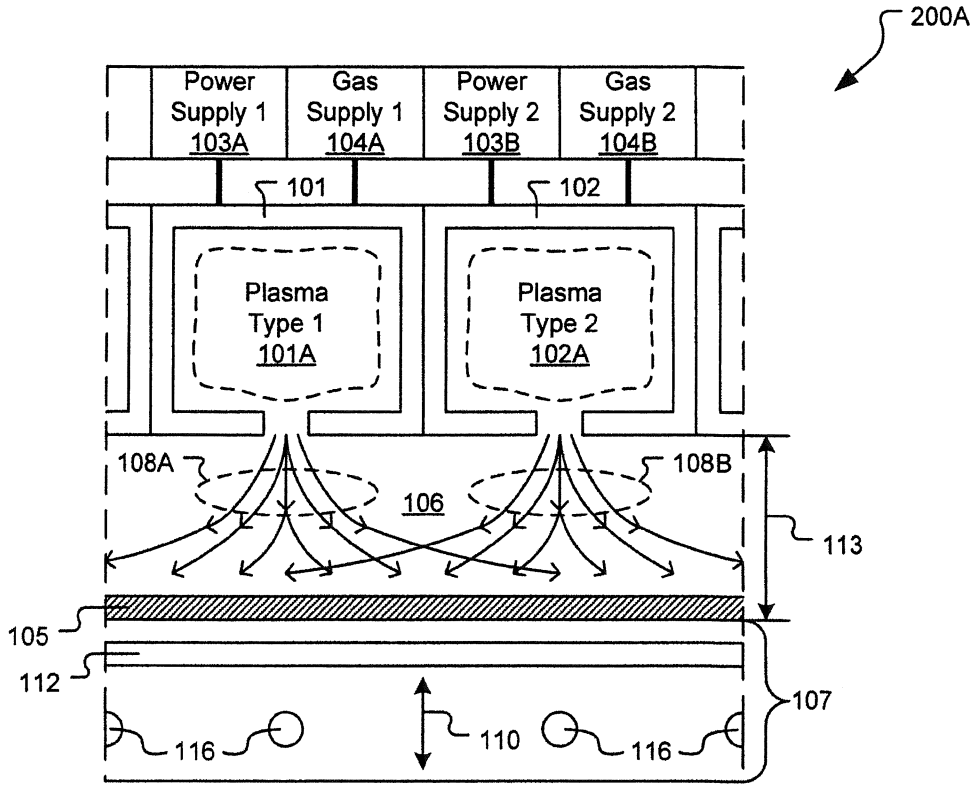

200A
Power Supply 1 103A
Gas Supply 1 104A
Power Supply 2 103B
Gas Supply 2 104B
101
102
Plasma Type 1 101A
Plasma Type 2 102A
108A
108B
106
113
105
112
107
116
110
116

Fig. 2A

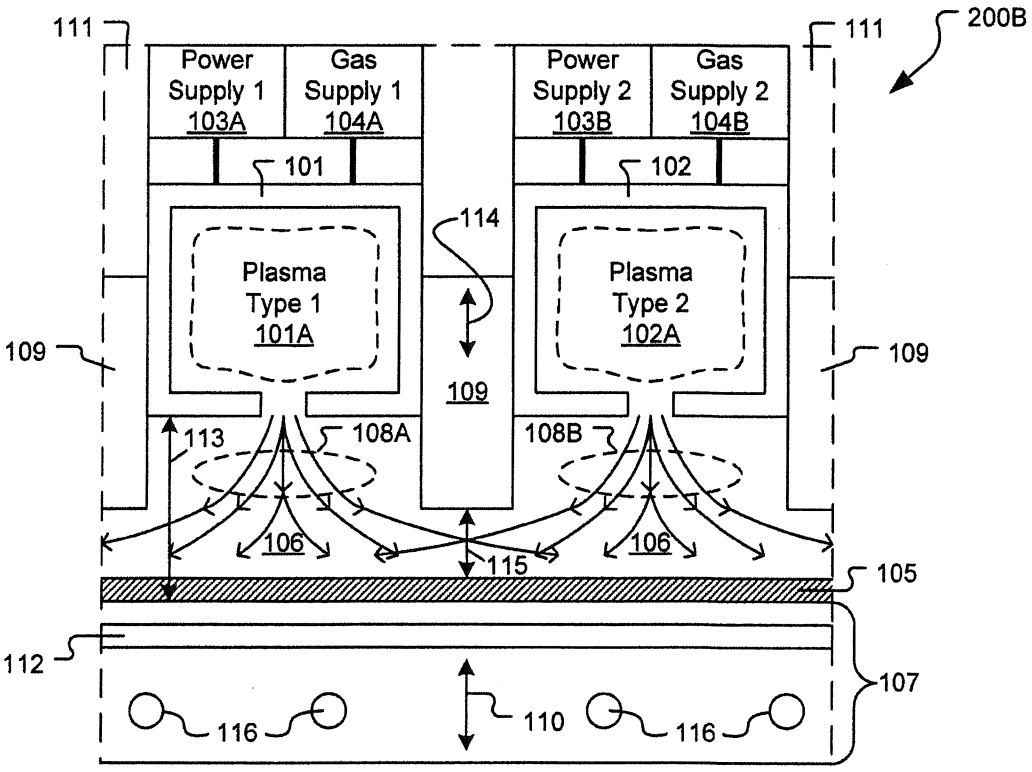

200B
111
111
Power Supply 1 103A
Gas Supply 1 104A
Power Supply 2 103B
Gas Supply 2 104B
101
102
114
Plasma Type 1 101A
Plasma Type 2 102A
109
109
109
113
108A
108B
106
106
115
105
112
107
116
110
116

Fig. 2B

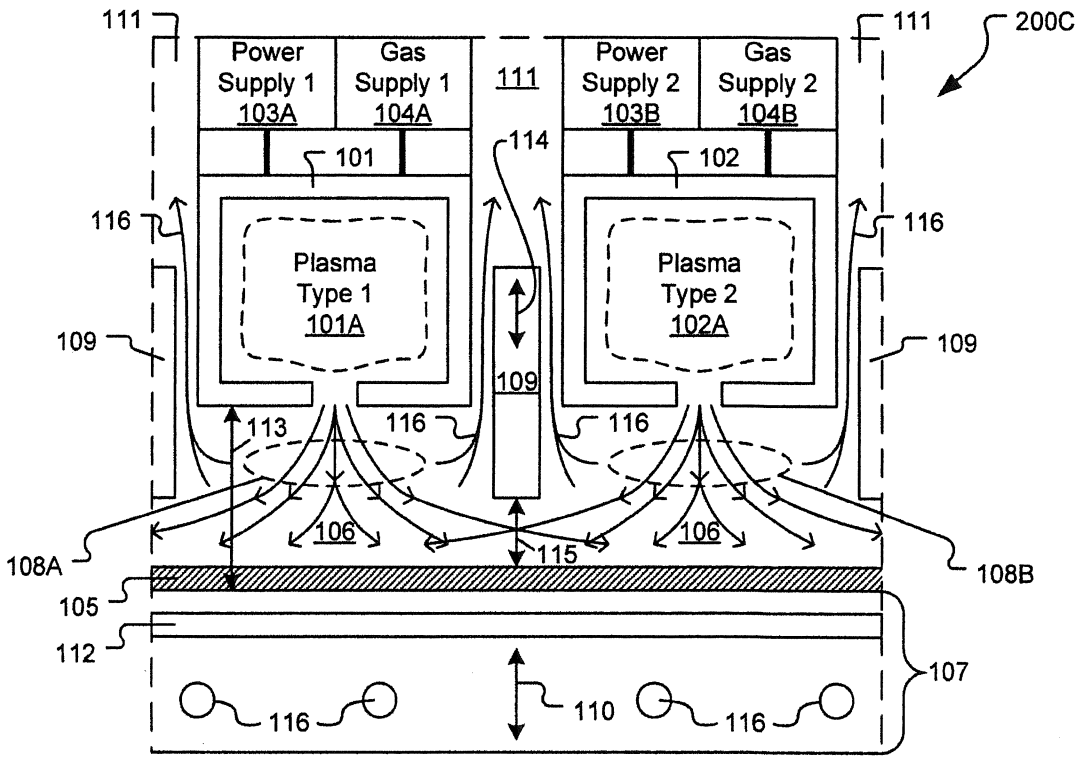

111
Power Supply 1 103A
Gas Supply 1 104A
111
Power Supply 2 103B
Gas Supply 2 104B
111
200C
101
102
114
116
116
Plasma Type 1 101A
Plasma Type 2 102A
109
109
109
113
116
116
106
106
115
108A
108B
105
112
107
116
110
116

Fig. 2C

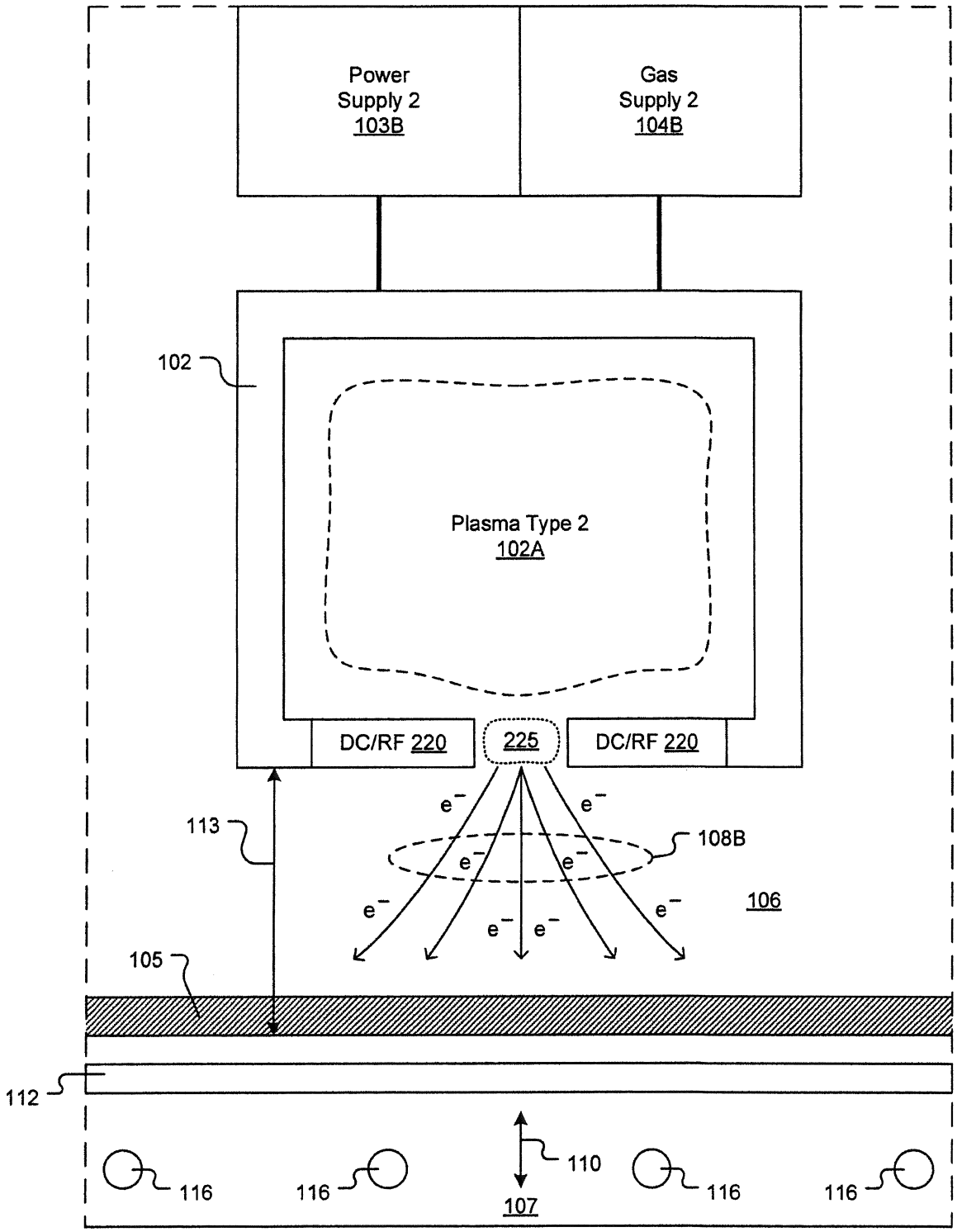

Power
Supply 2
103B
Gas
Supply 2
104B
102
Plasma Type 2
102A
DC/RF 220
225
DC/RF 220
113
e⁻
108B
106
105
112
110
107
116
116
116
116

Fig. 2D

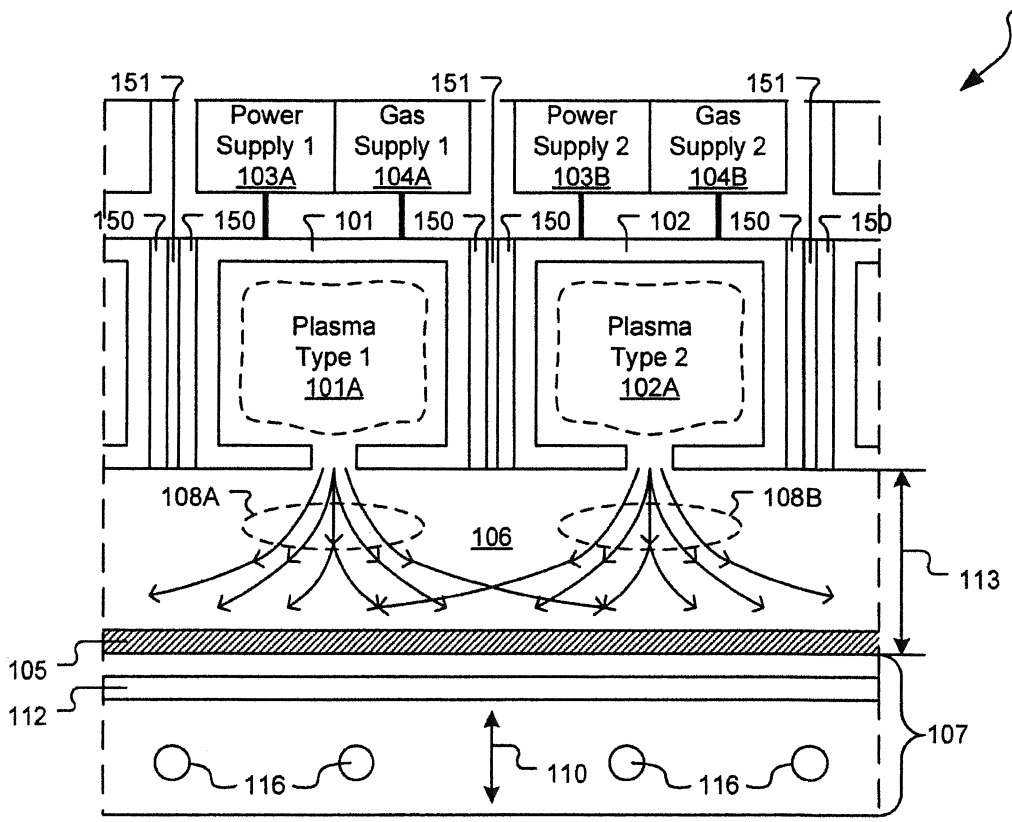


Fig. 2E

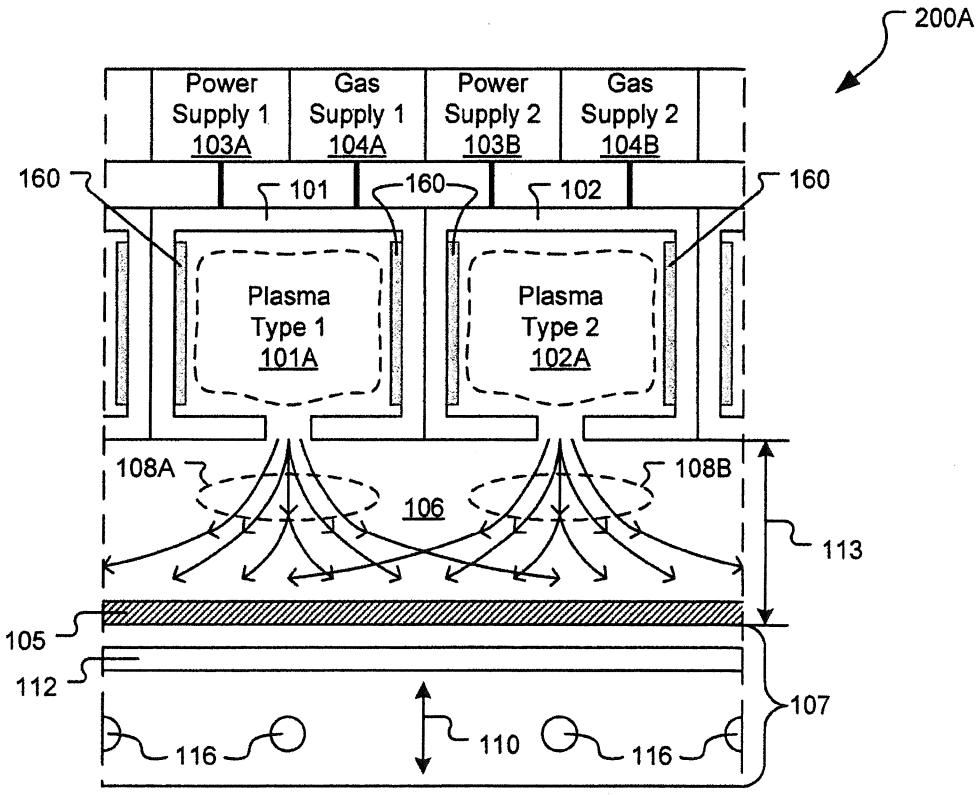


Fig. 2F-1

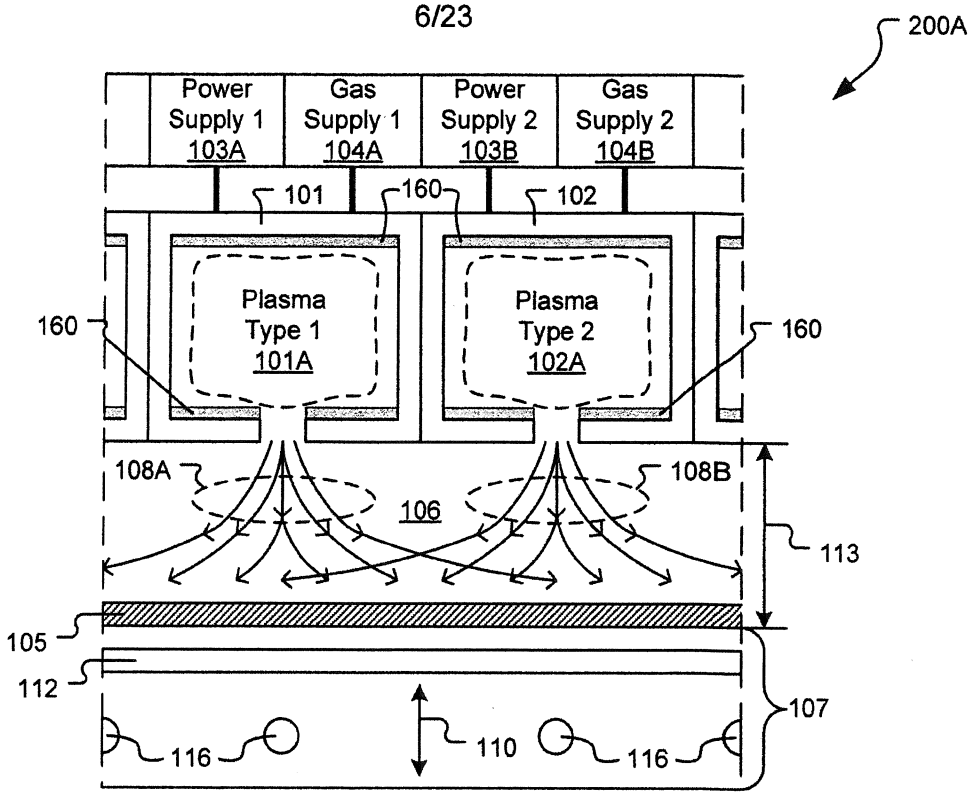


Fig. 2F-2

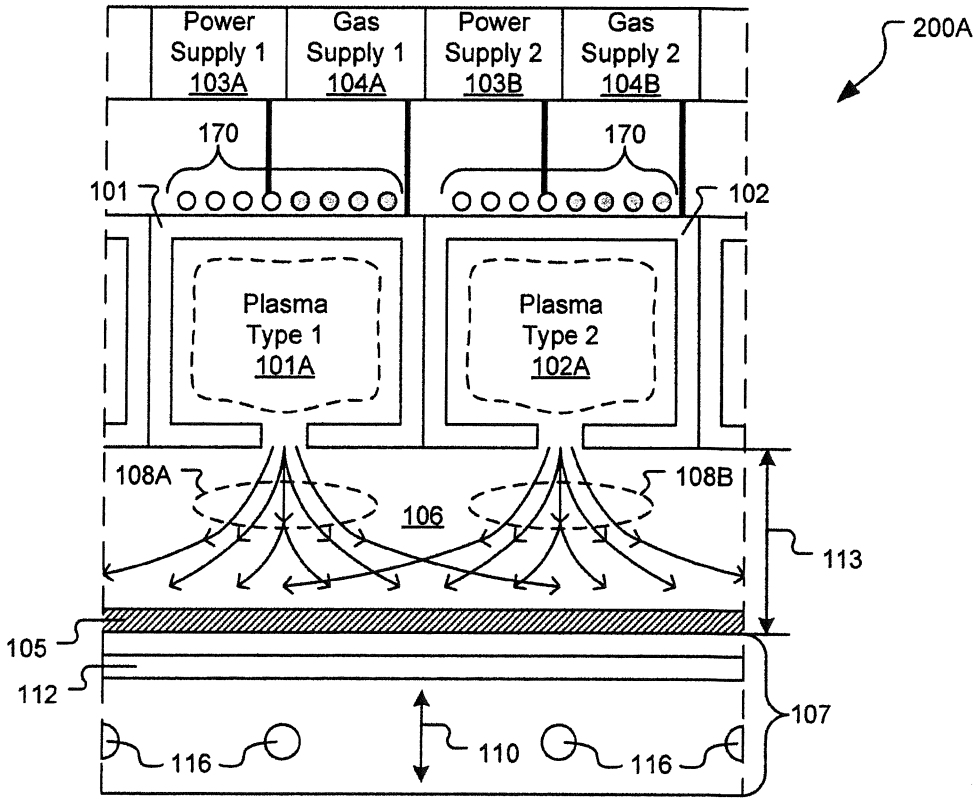


Fig. 2G

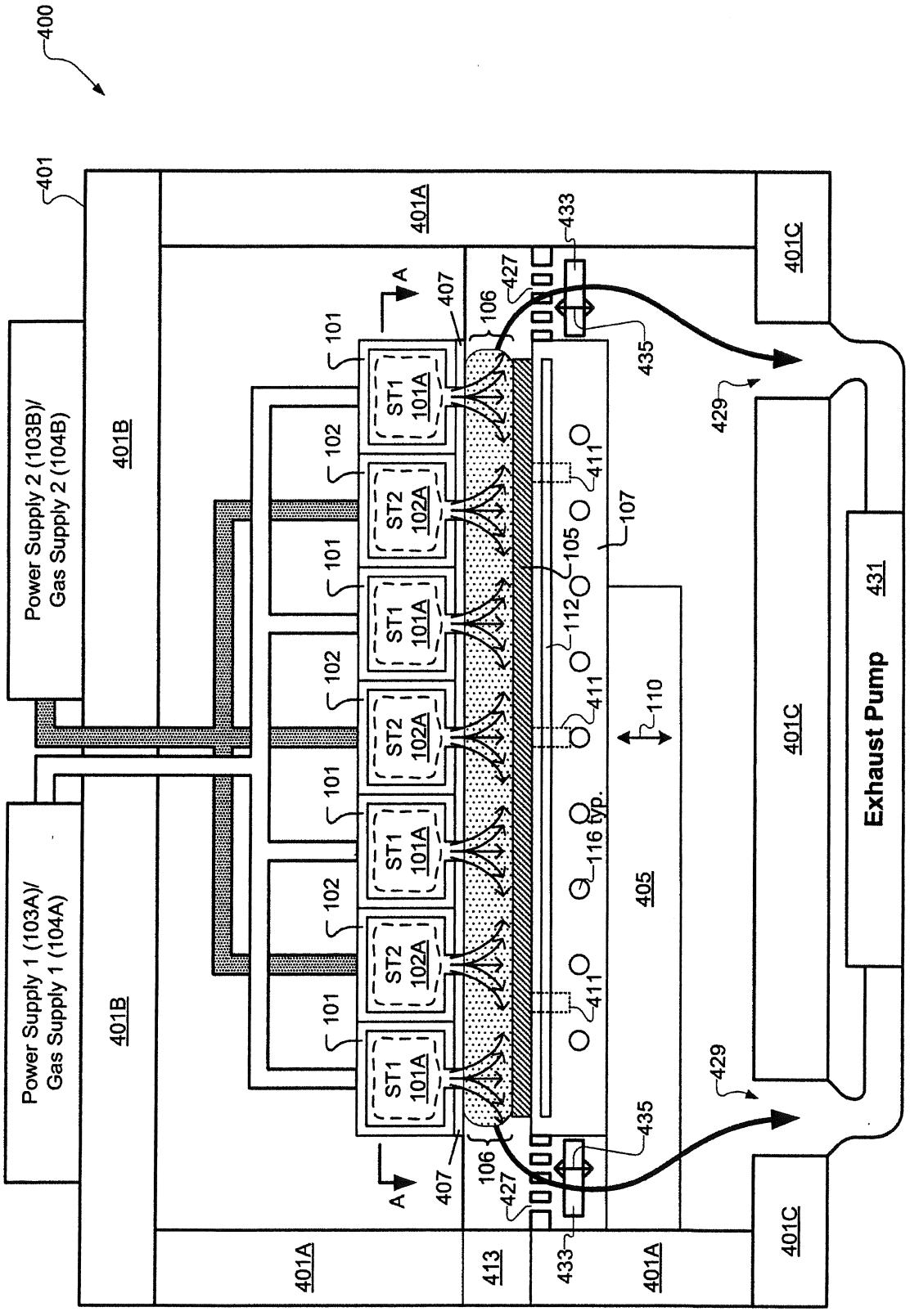
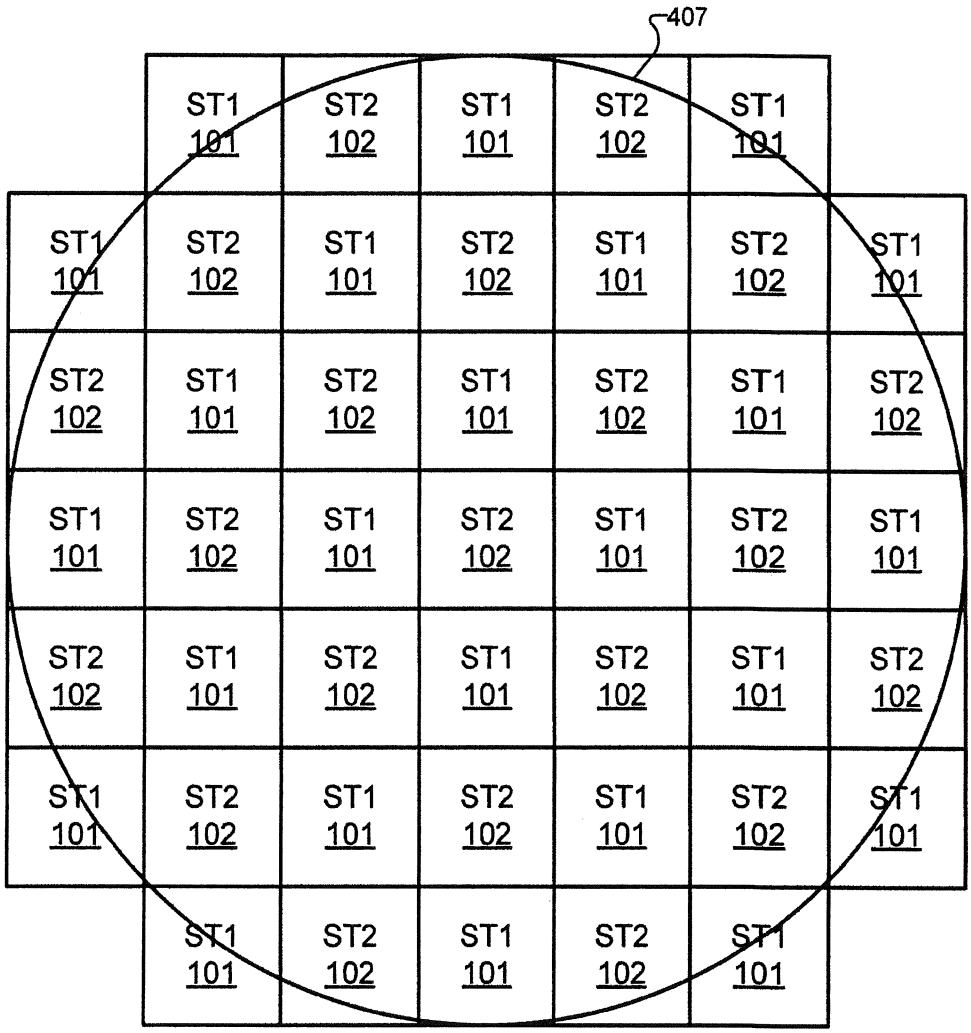
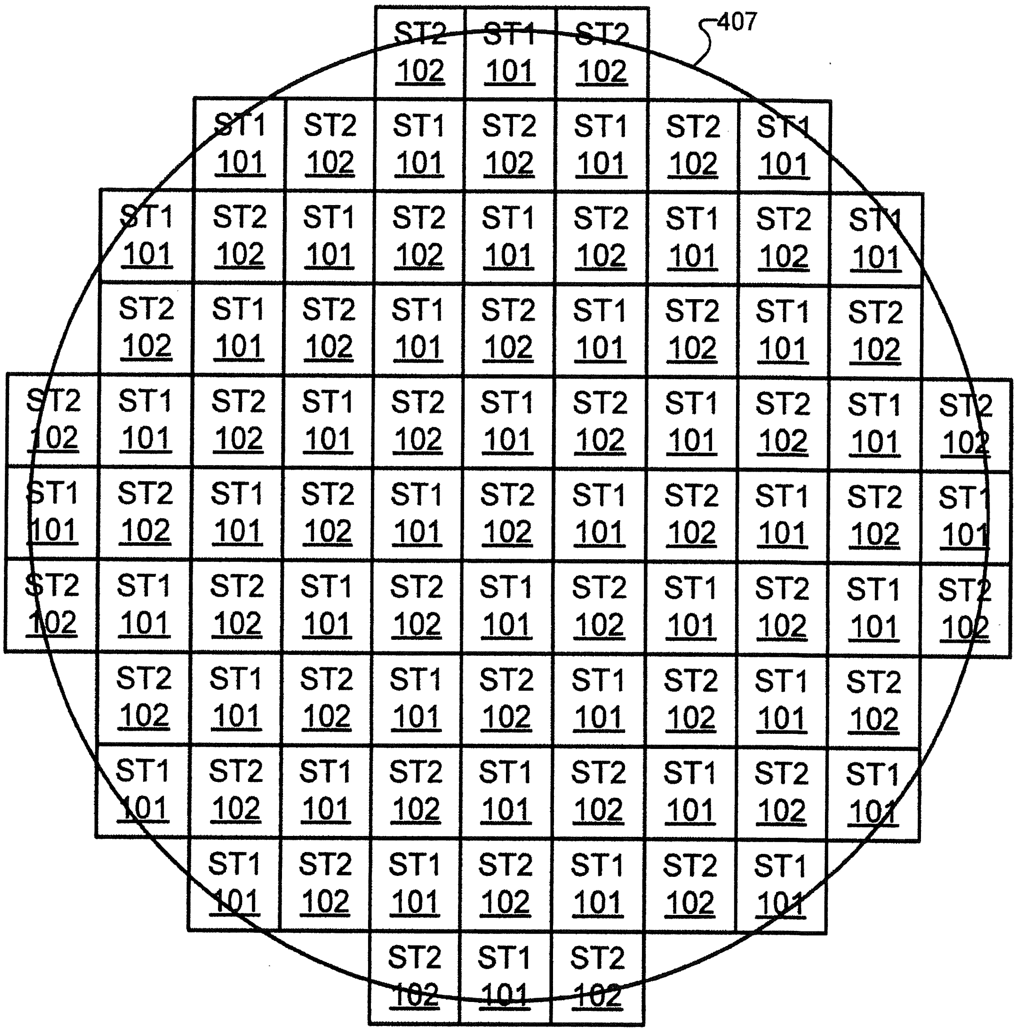

400
401
401A
401B
401C
Power Supply 2 (103B)/
Gas Supply 2 (104B)
Power Supply 1 (103A)/
Gas Supply 1 (104A)
ST1
101A
ST2
102A
101
102
A
407
106
427
433
435
429
411
107
105
112
110
116 typ.
405
413
Exhaust Pump
431

Fig. 3A



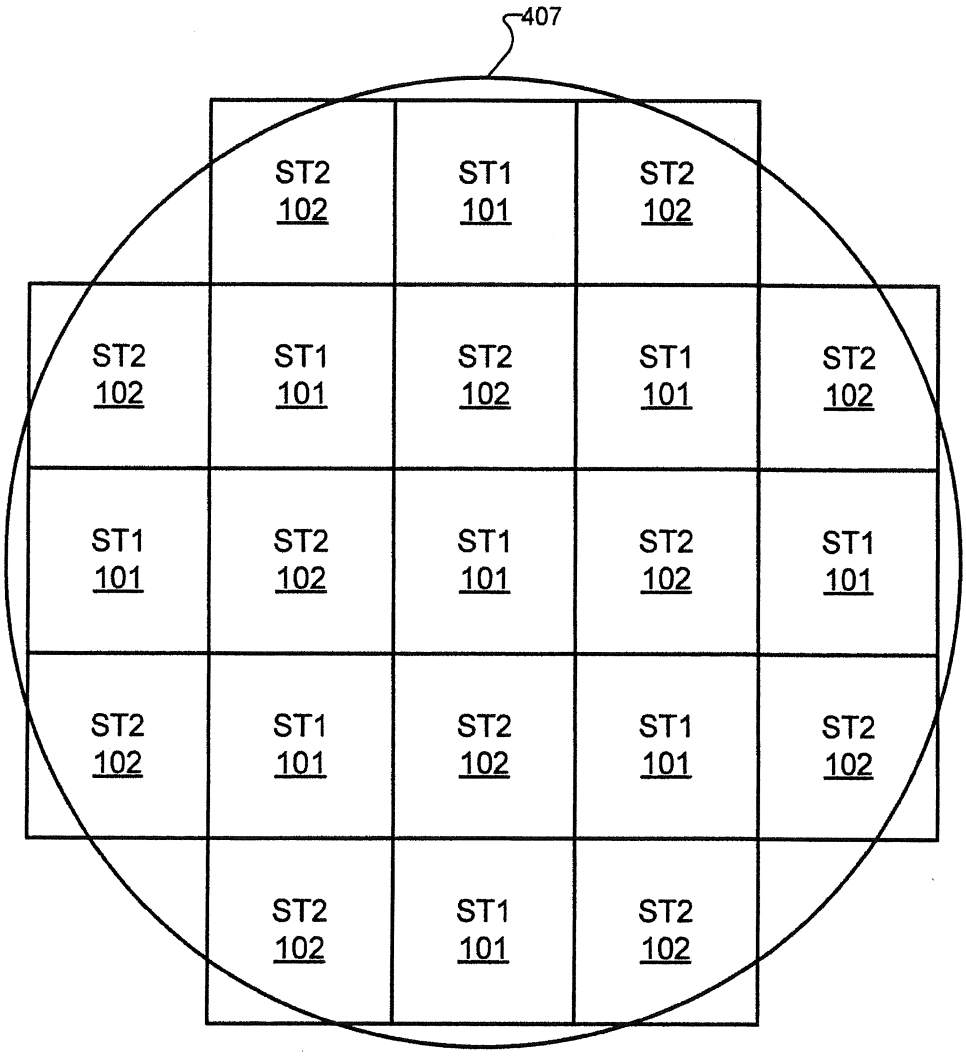
View A-A

Fig. 3B



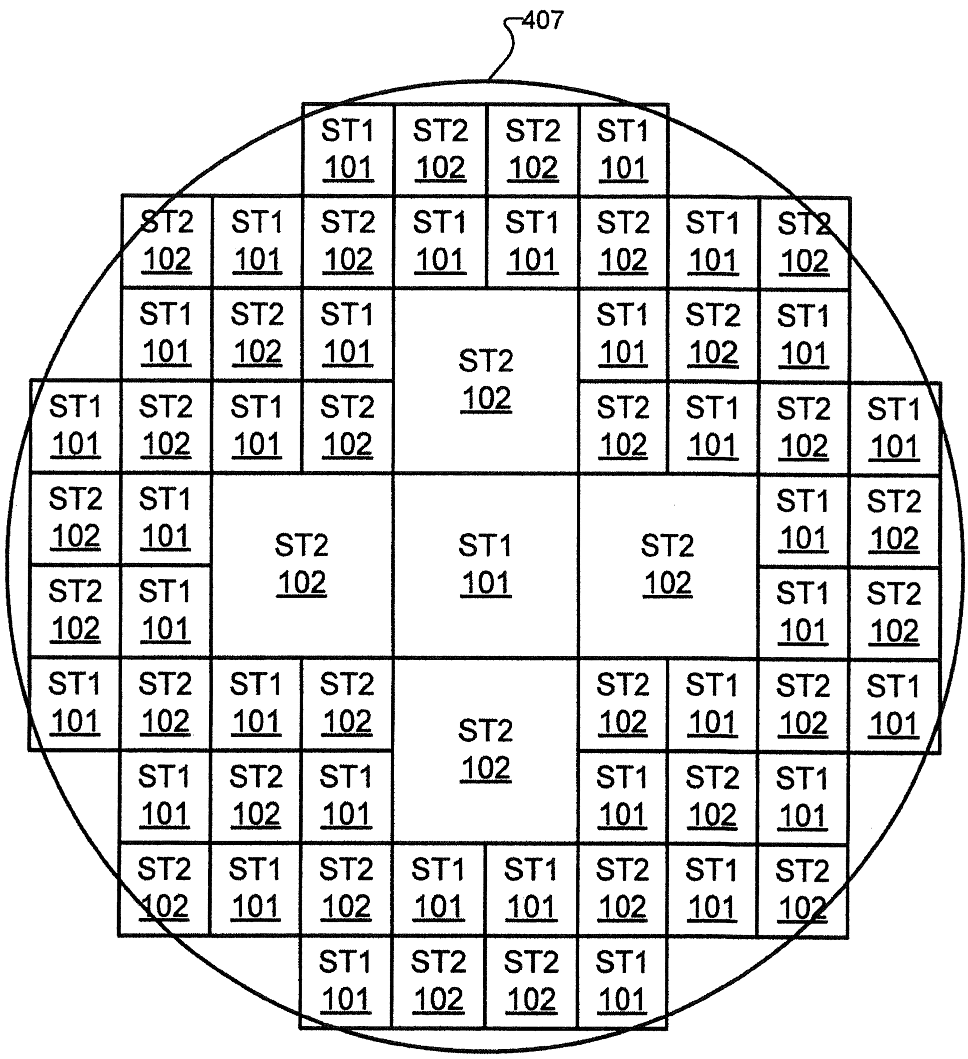
View A-A

Fig. 3C



View A-A

Fig. 3D



View A-A

Fig. 3E

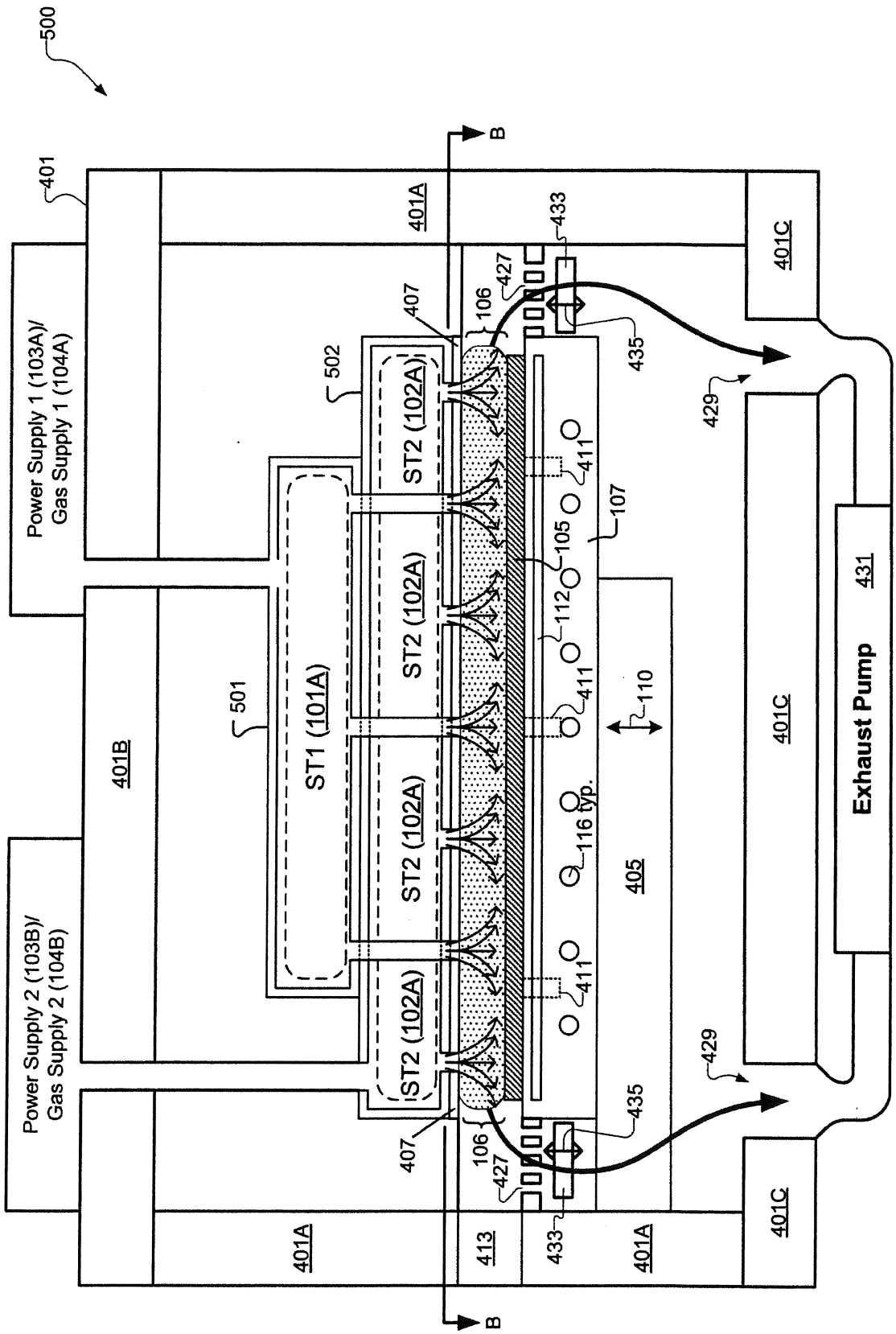
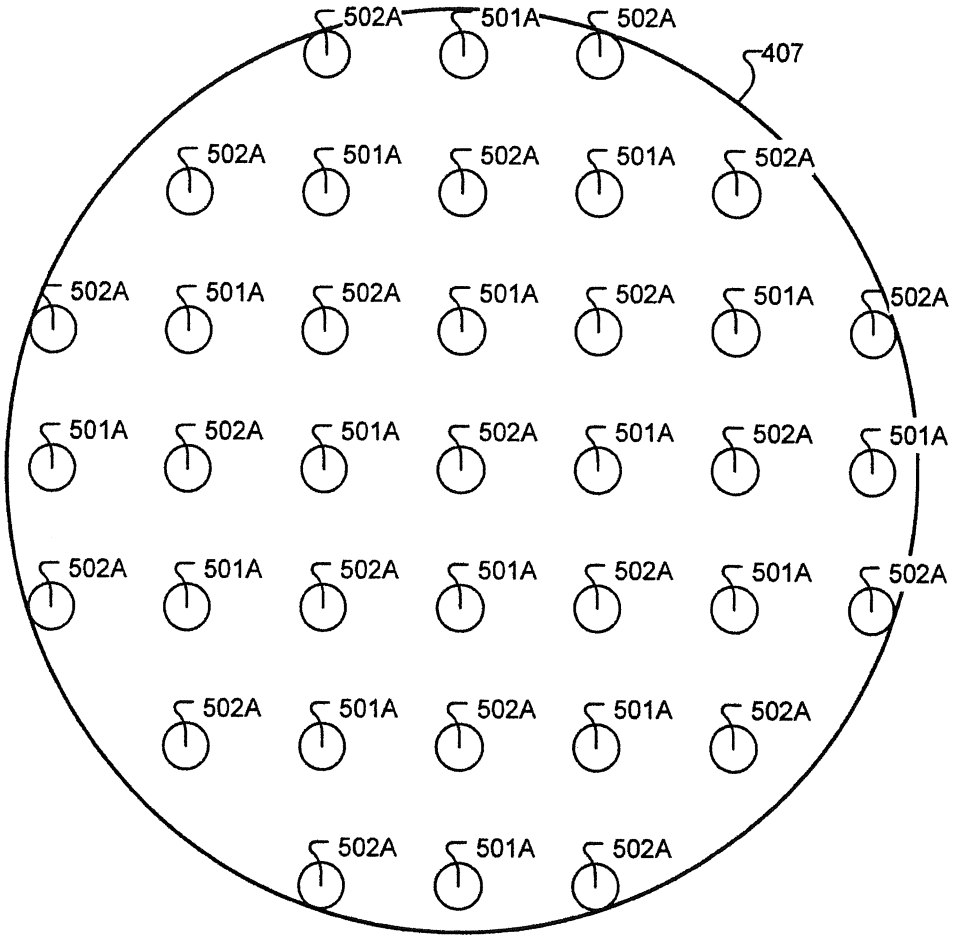
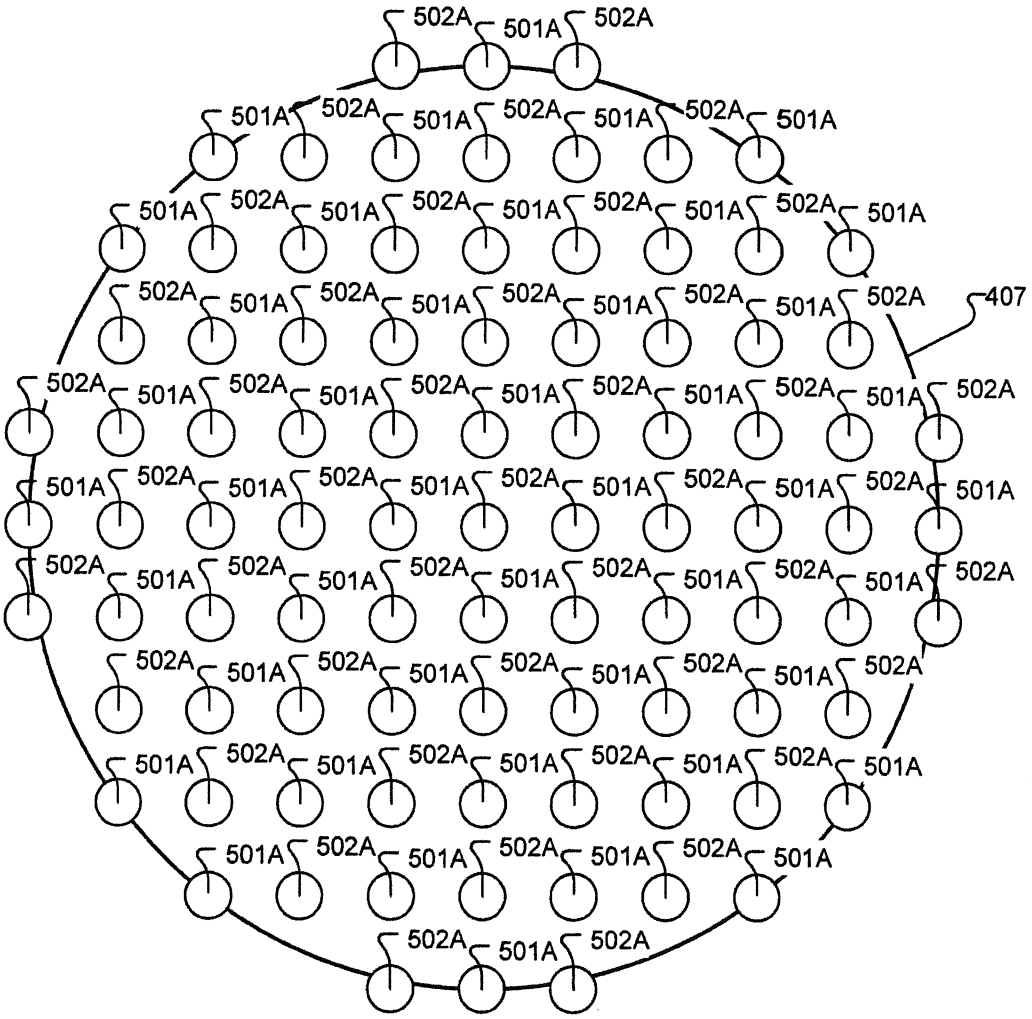

500
401
401A
401B
401C
B
B
433
427
106
407
502
435
429
411
107
105
112
110
116 typ.
405
413
431
Exhaust Pump
Power Supply 1 (103A)/
Gas Supply 1 (104A)
Power Supply 2 (103B)/
Gas Supply 2 (104B)
ST1 (101A)
ST2 (102A)
ST2 (102A)
ST2 (102A)
ST2 (102A)
501

Fig. 4A



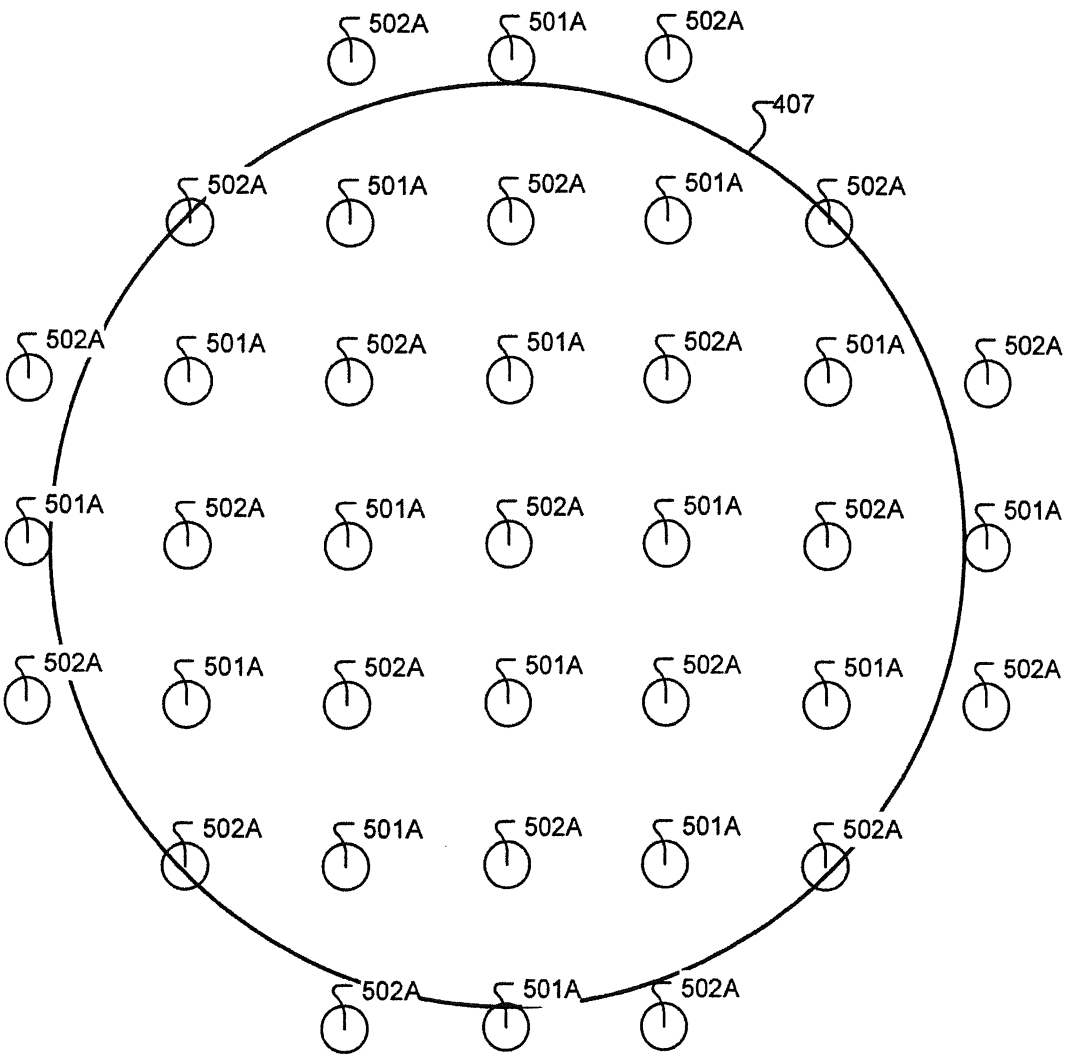
View B-B

Fig. 4B



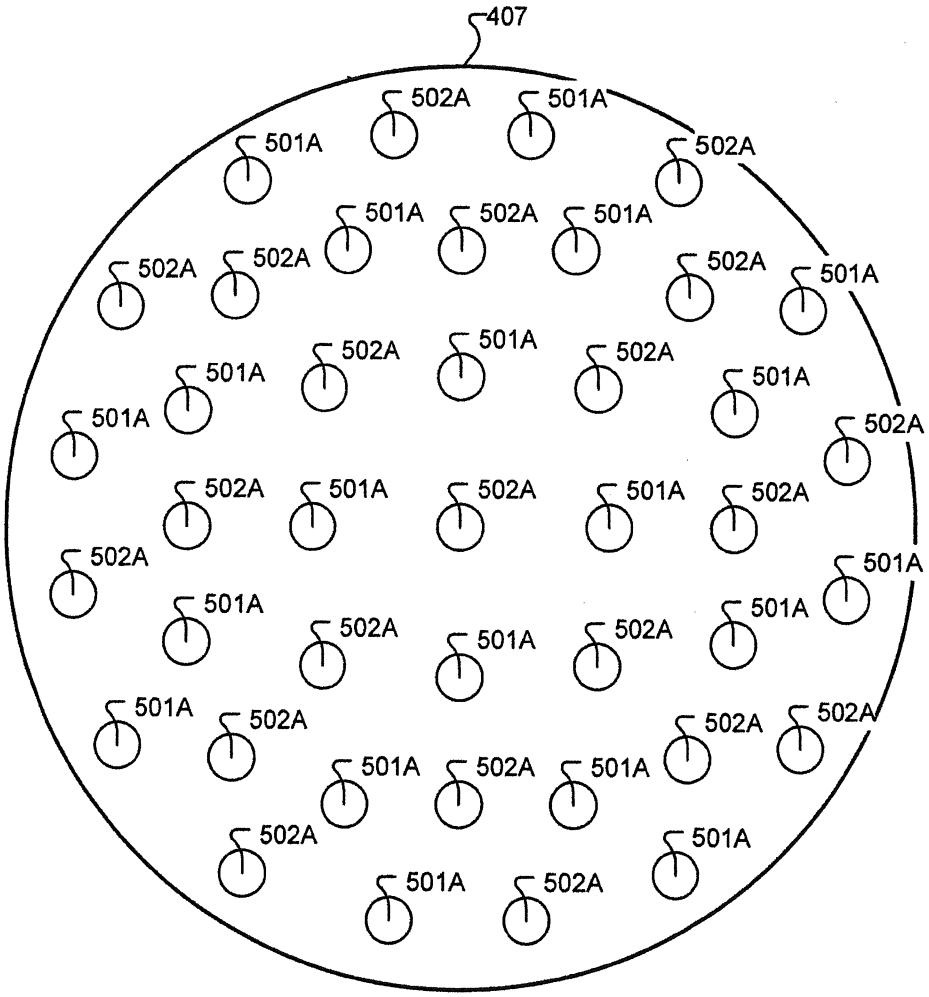
View B-B

Fig. 4C



View B-B

Fig. 4D



View B-B

Fig. 4E

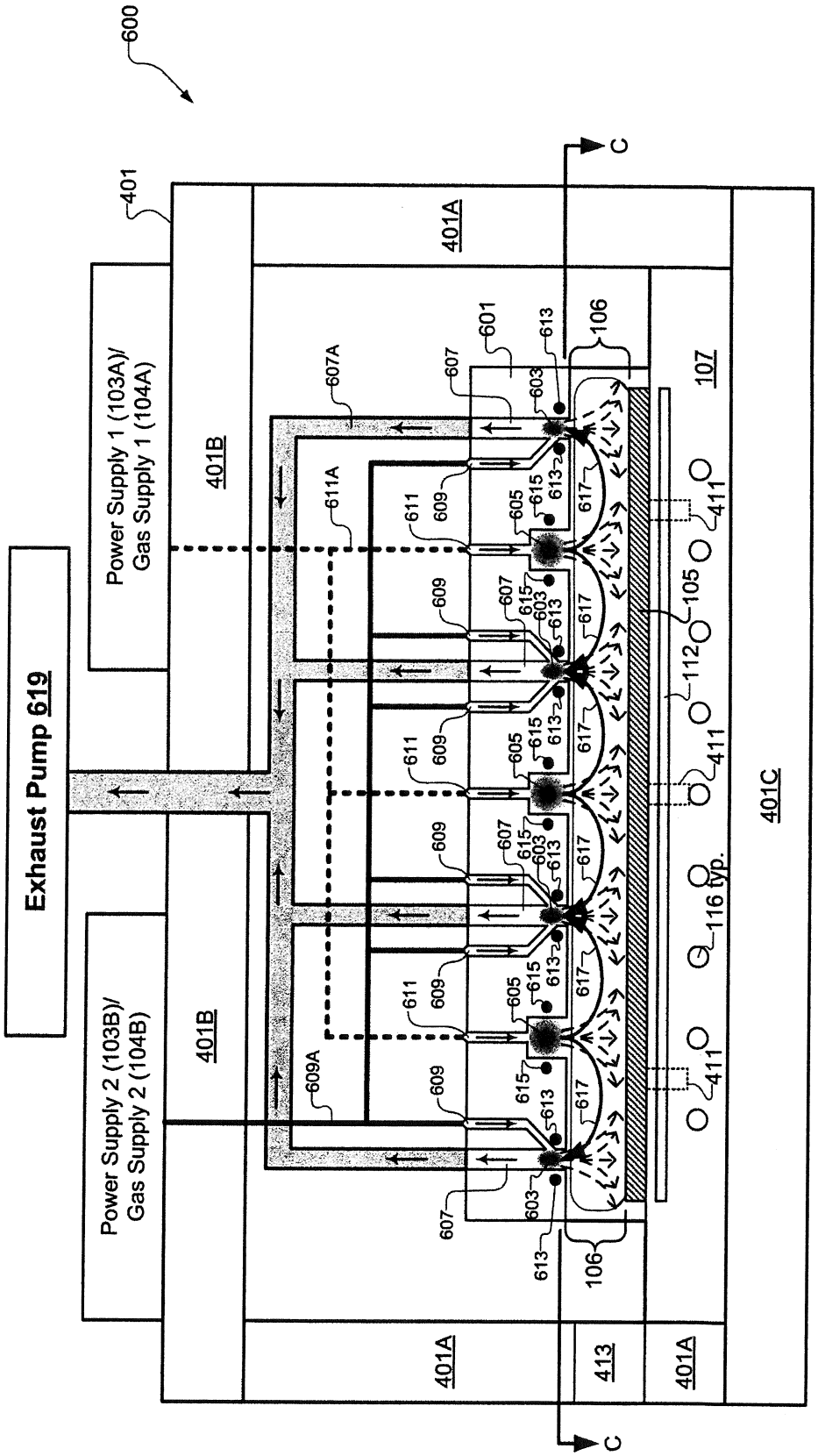
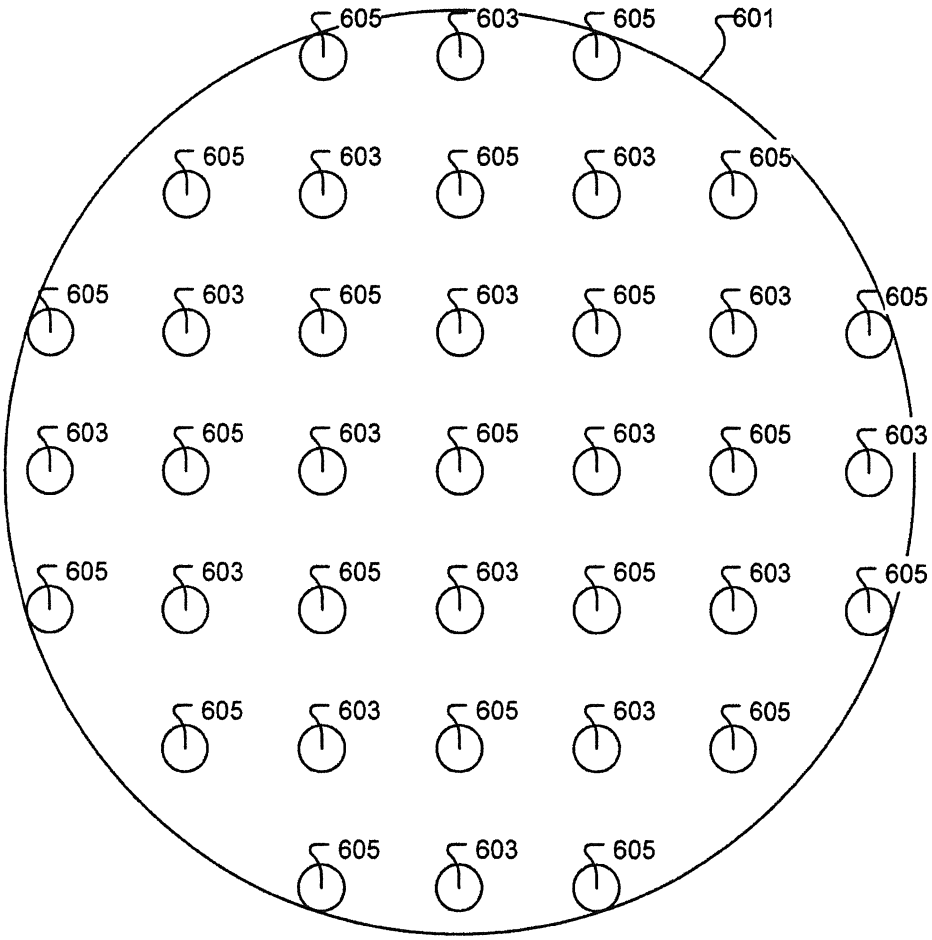
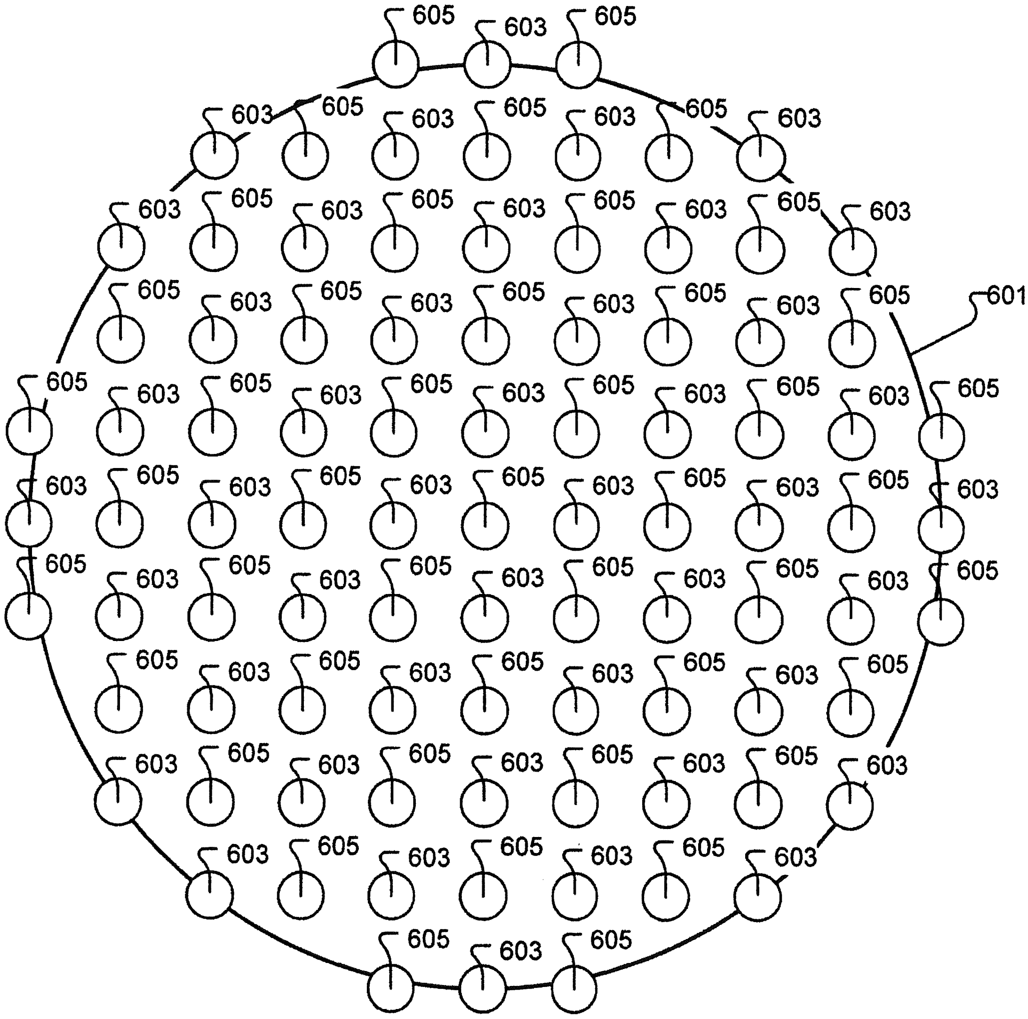

600
401
Exhaust Pump 619
Power Supply 1 (103A)/
Gas Supply 1 (104A)
Power Supply 2 (103B)/
Gas Supply 2 (104B)
401A
401B
401C
413
107
106
105
112
411
116 typ.
C
C
601
603
605
607
607A
609
609A
611
611A
613
615
617

Fig. 5A



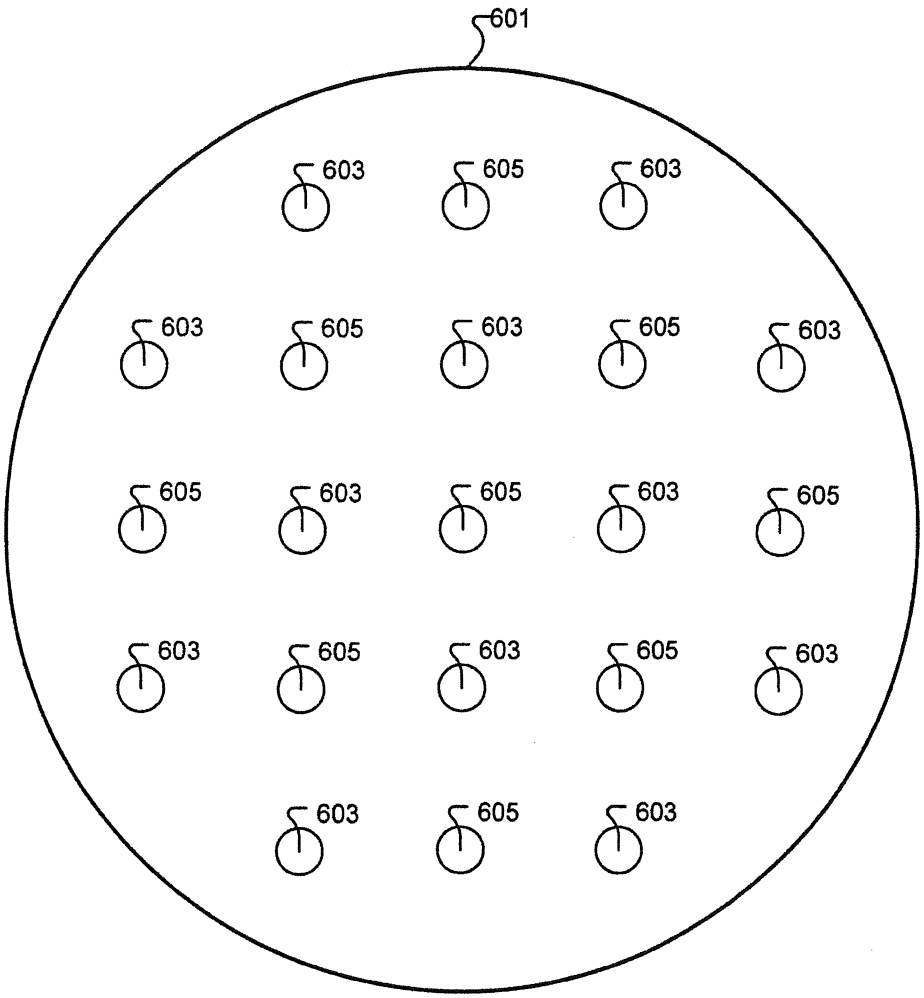
View C-C

Fig. 5B



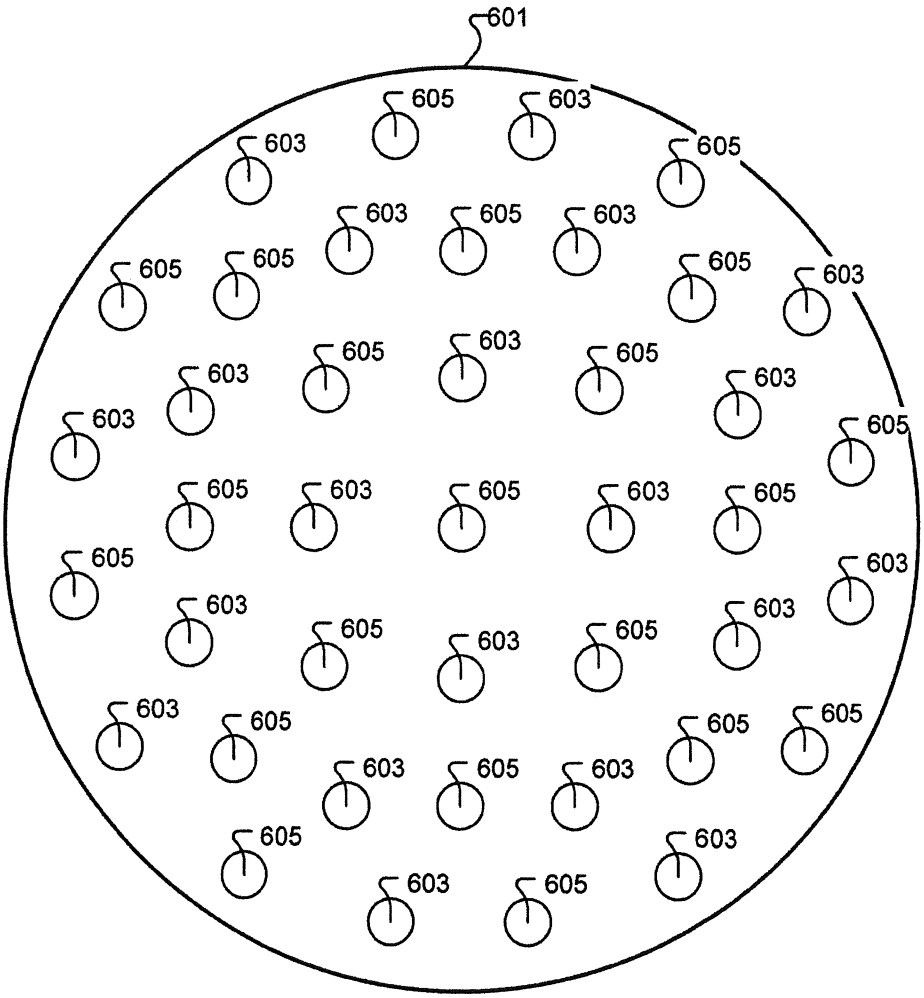
View B-B

Fig. 5C



View B-B

Fig. 5D



View B-B

Fig. 5E

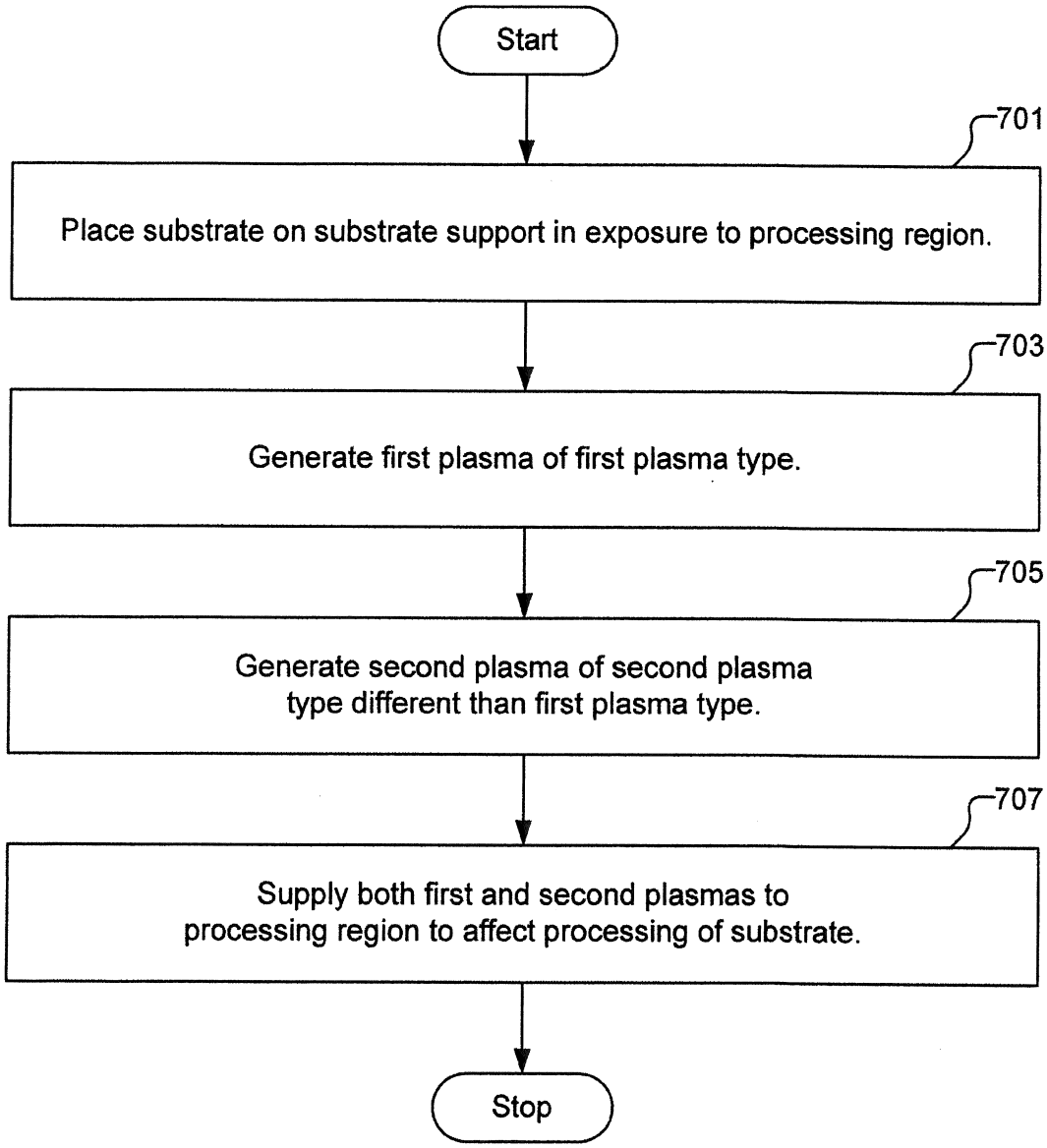

Start
701
Place substrate on substrate support in exposure to processing region.
703
Generate first plasma of first plasma type.
705
Generate second plasma of second plasma type different than first plasma type.
707
Supply both first and second plasmas to processing region to affect processing of substrate.
Stop

Fig. 6

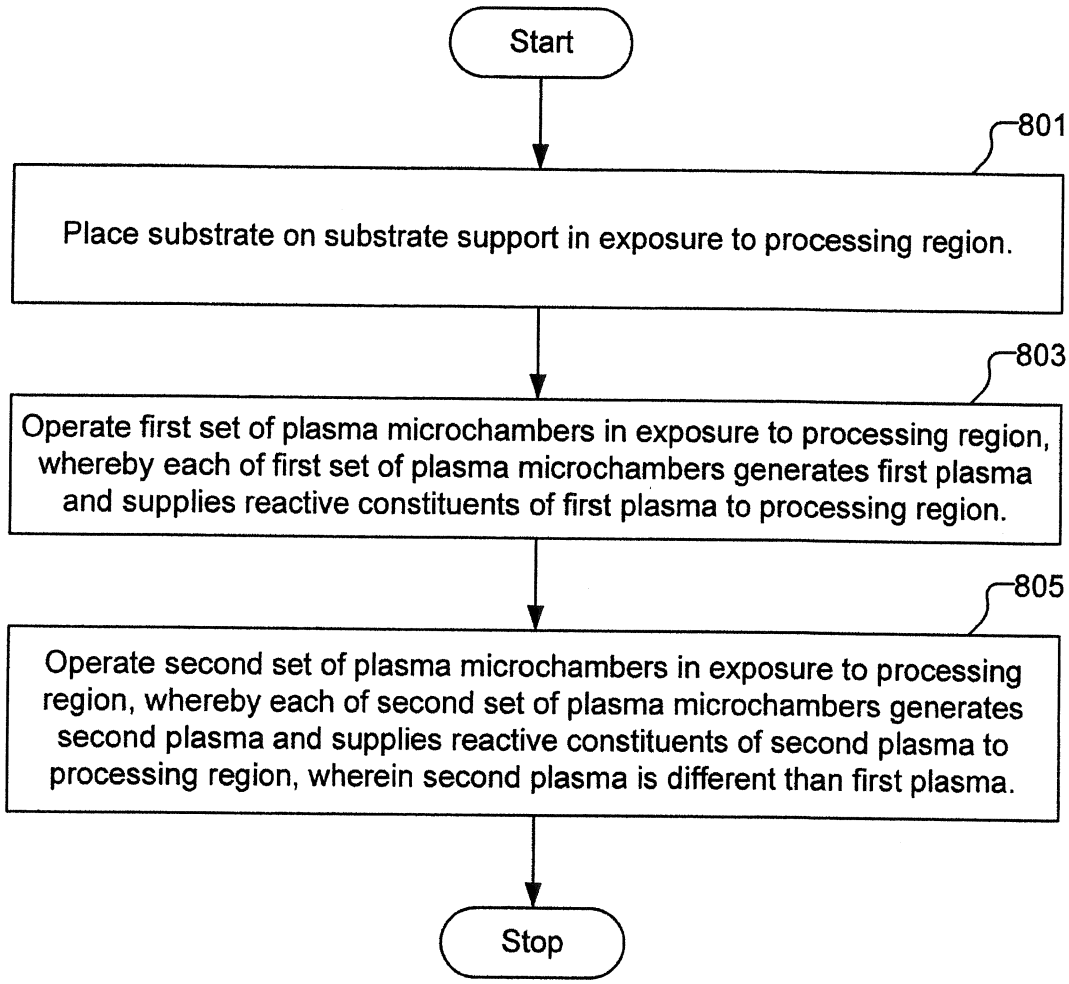

Start
801
Place substrate on substrate support in exposure to processing region.
803
Operate first set of plasma microchambers in exposure to processing region, whereby each of first set of plasma microchambers generates first plasma and supplies reactive constituents of first plasma to processing region.
805
Operate second set of plasma microchambers in exposure to processing region, whereby each of second set of plasma microchambers generates second plasma and supplies reactive constituents of second plasma to processing region, wherein second plasma is different than first plasma.
Stop

Fig. 7