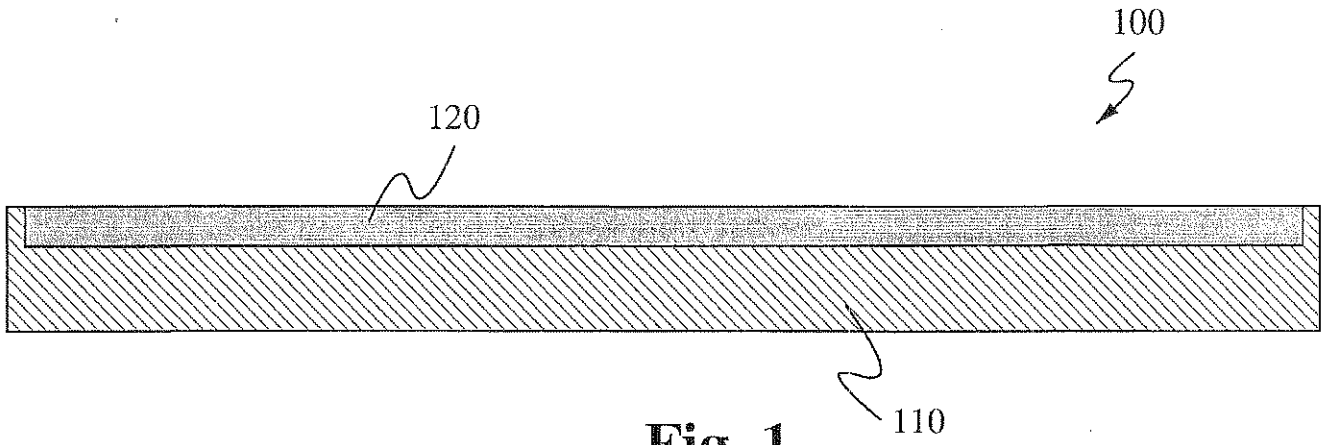


Fig. 1

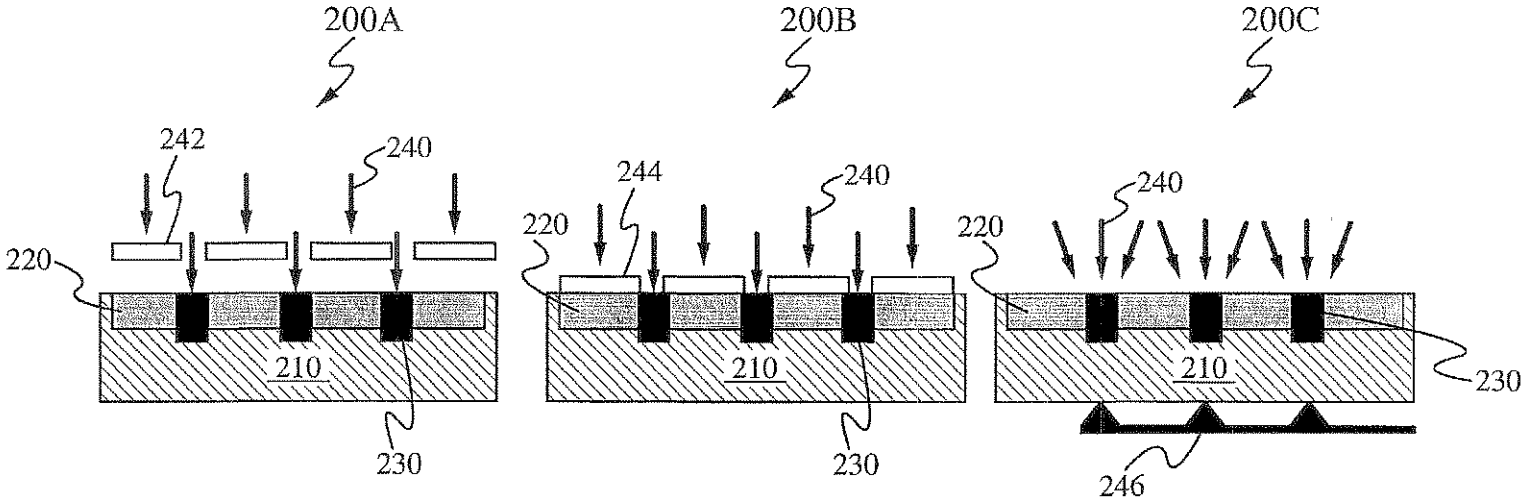


Fig. 2A Fig. 2B Fig. 2C

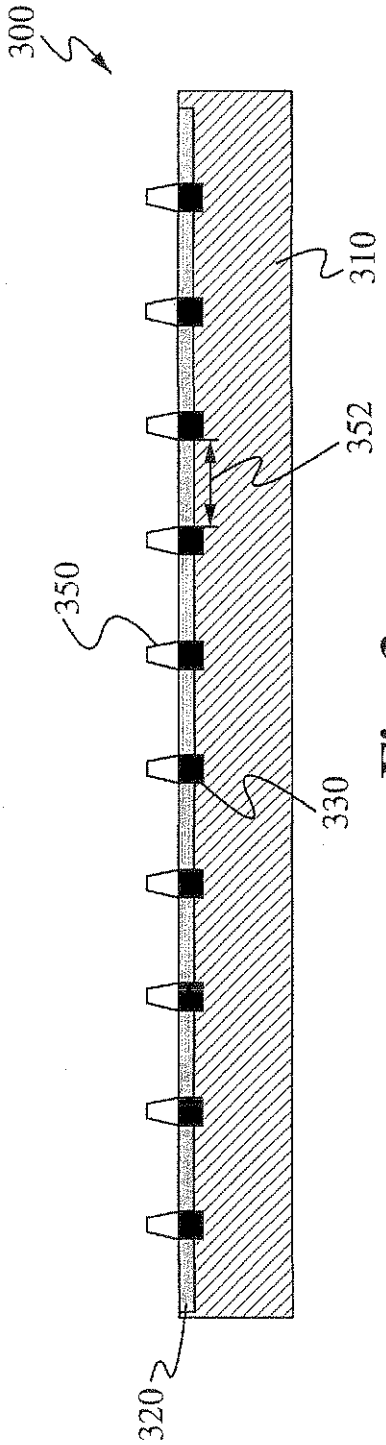

300
310
352
350
330
320

Fig. 3

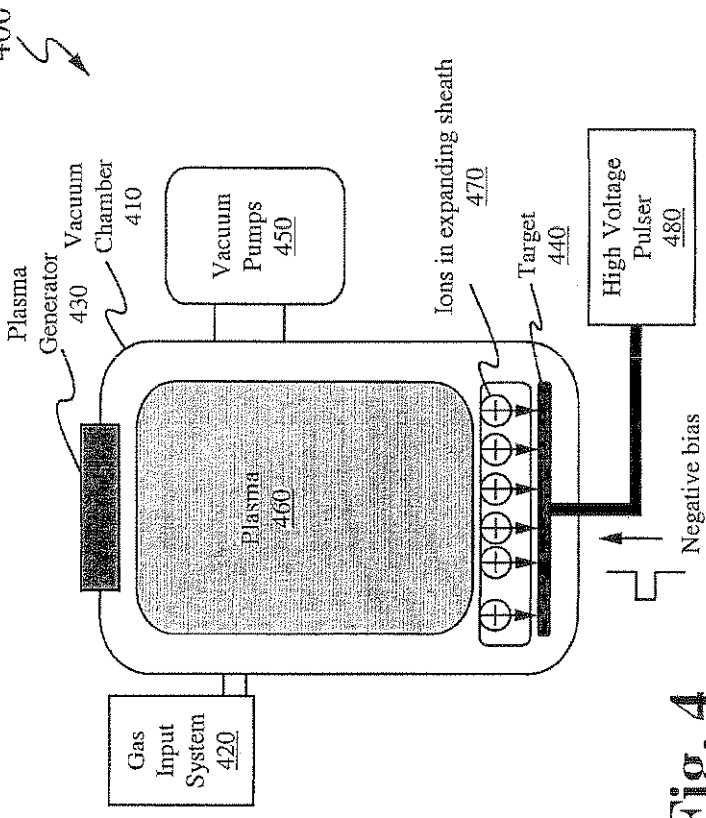

400
Plasma Generator 430
Vacuum Chamber 410
Vacuum Pumps 450
Ions in expanding sheath 470
Target 440
High Voltage Pulser 480
Plasma 460
Gas Input System 420
Negative bias

Fig. 4

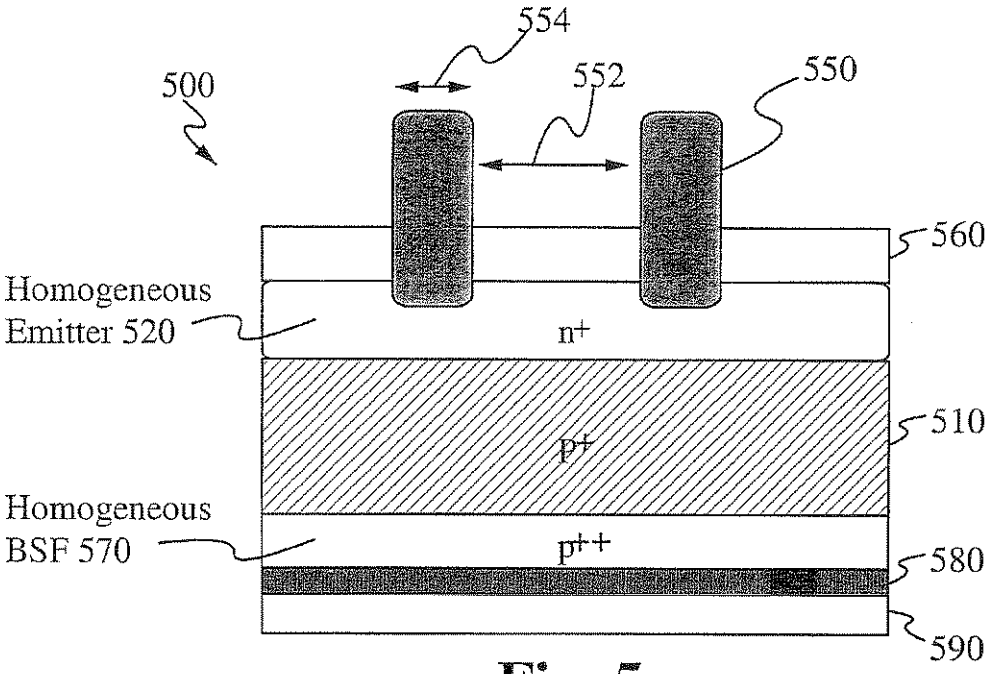

554
552
550
500
560
Homogeneous
Emitter 520
n+
510
p+
Homogeneous
BSF 570
p++
580
590

Fig. 5

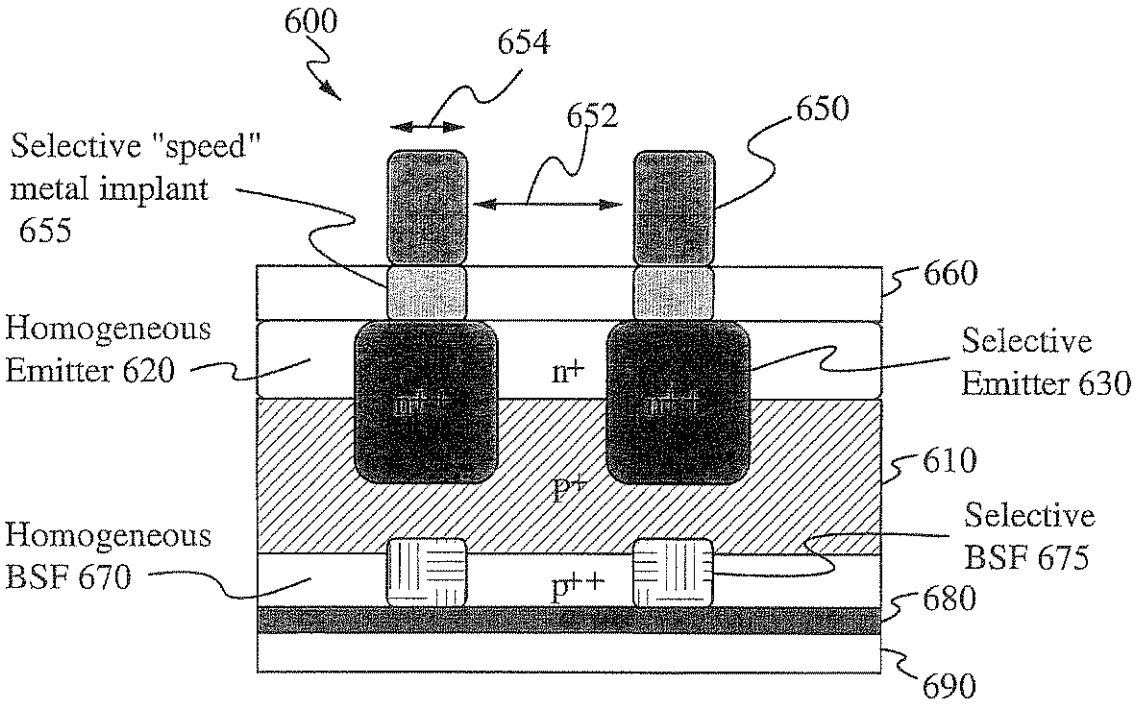

600
654
652
650
Selective "speed"
metal implant
655
660
Homogeneous
Emitter 620
n+
Selective
Emitter 630
610
p+
Selective
BSF 675
Homogeneous
BSF 670
p++
680
690

Fig. 6

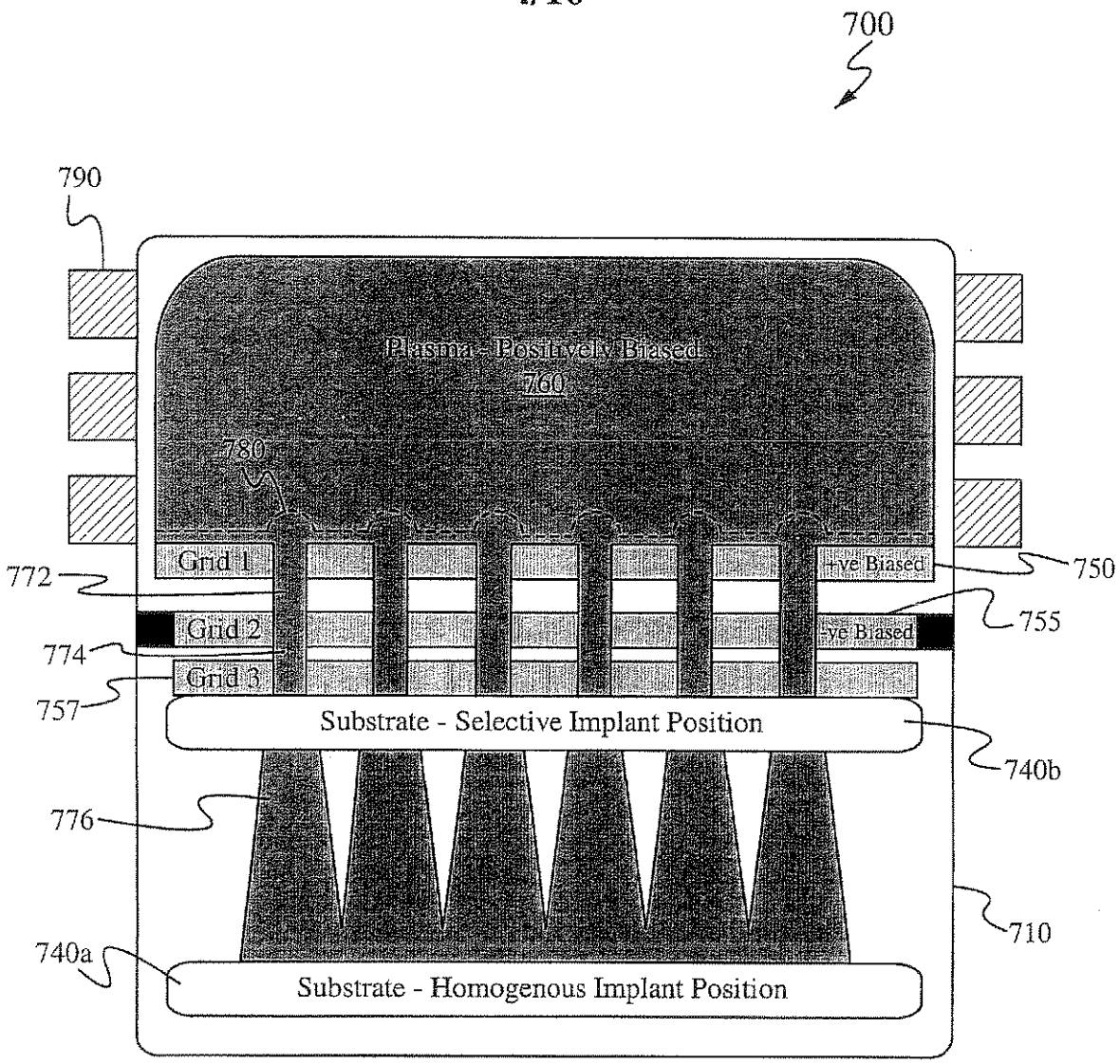

700
790
Plasma - Positively Biased
760
780
Grid 1
772
-ve Biased
750
Grid 2
755
-ve Biased
774
Grid 3
757
Substrate - Selective Implant Position
740b
776
710
740a
Substrate - Homogenous Implant Position

Fig. 7

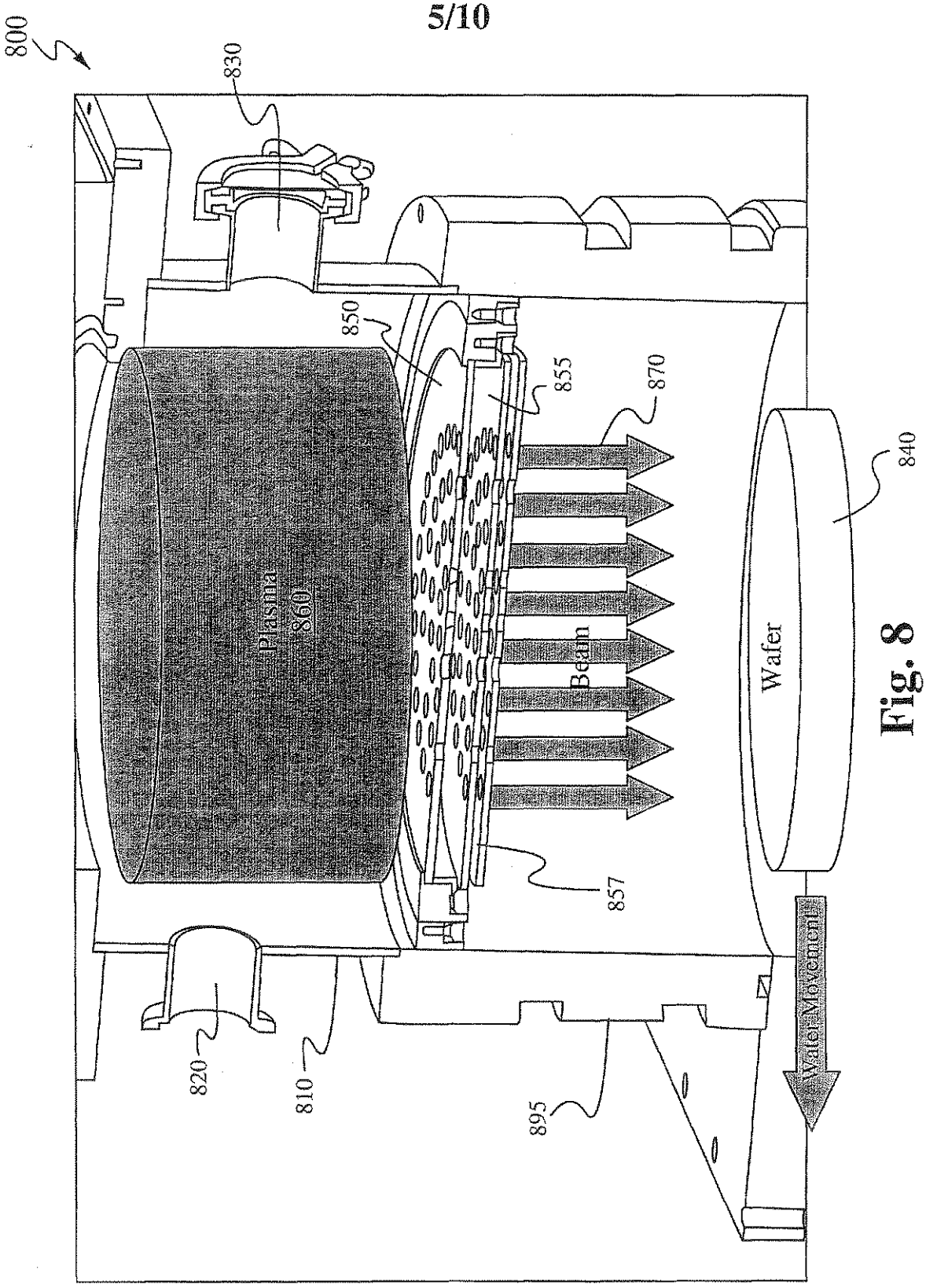

800
830
850
855
870
840
Plasma
860
Beam
Wafer
857
820
810
895
Wafer Movement

Fig. 8

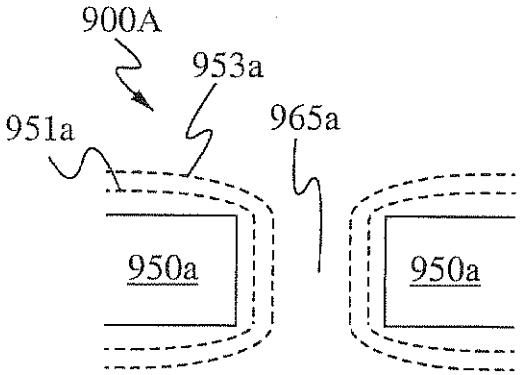


Fig. 9A

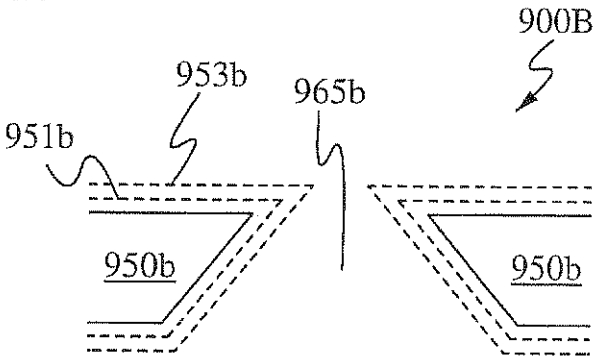


Fig. 9B

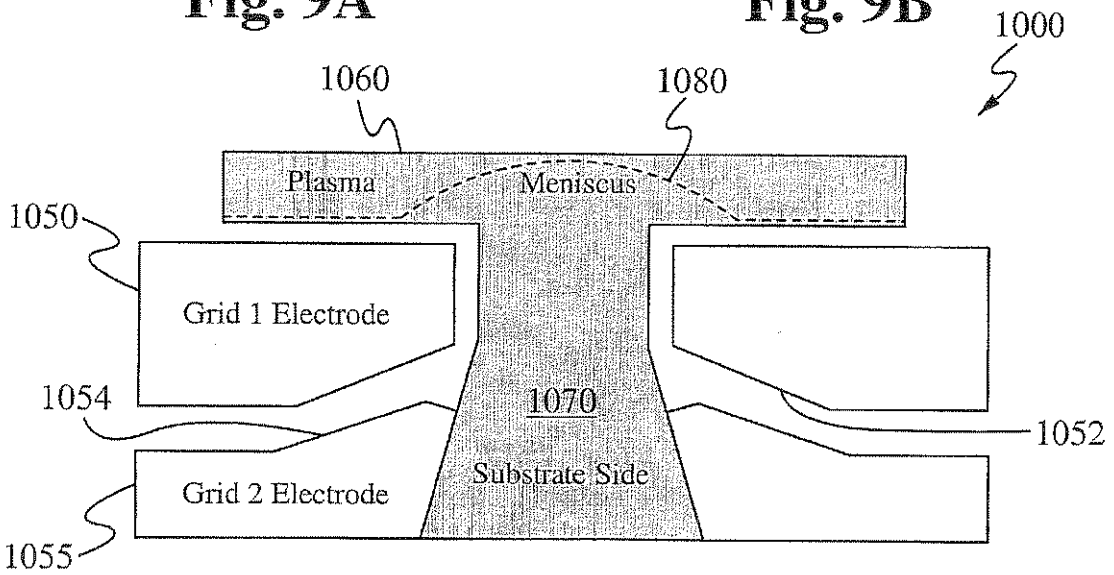


Fig. 10

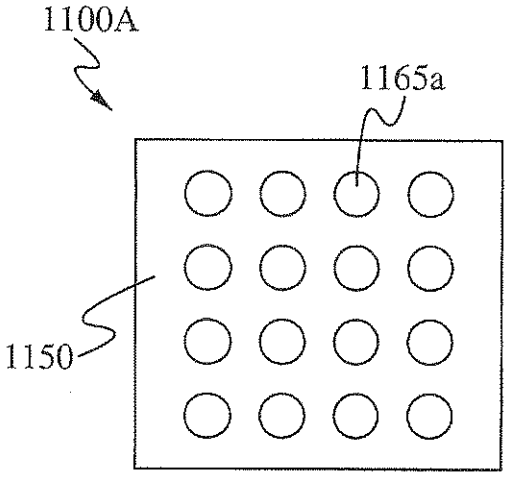


Fig. 11A

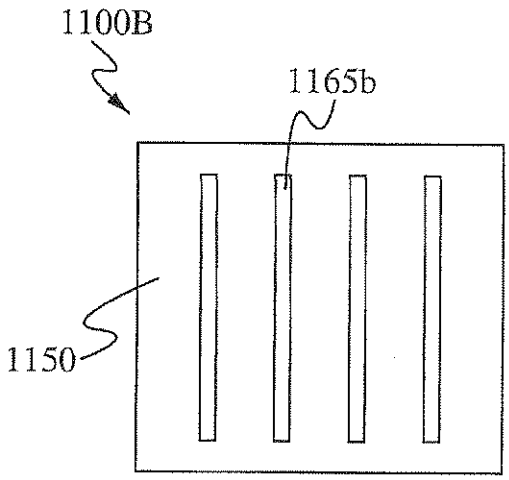


Fig. 11B

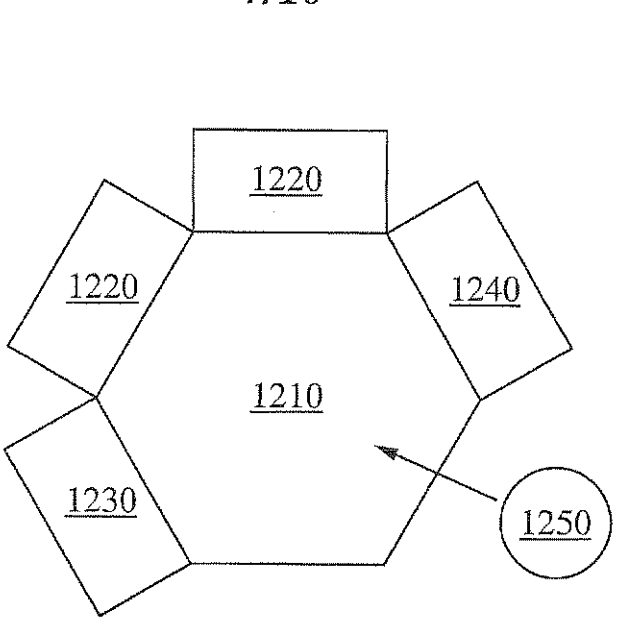

1200
1220
1220
1240
1210
1230
1250

Fig. 12

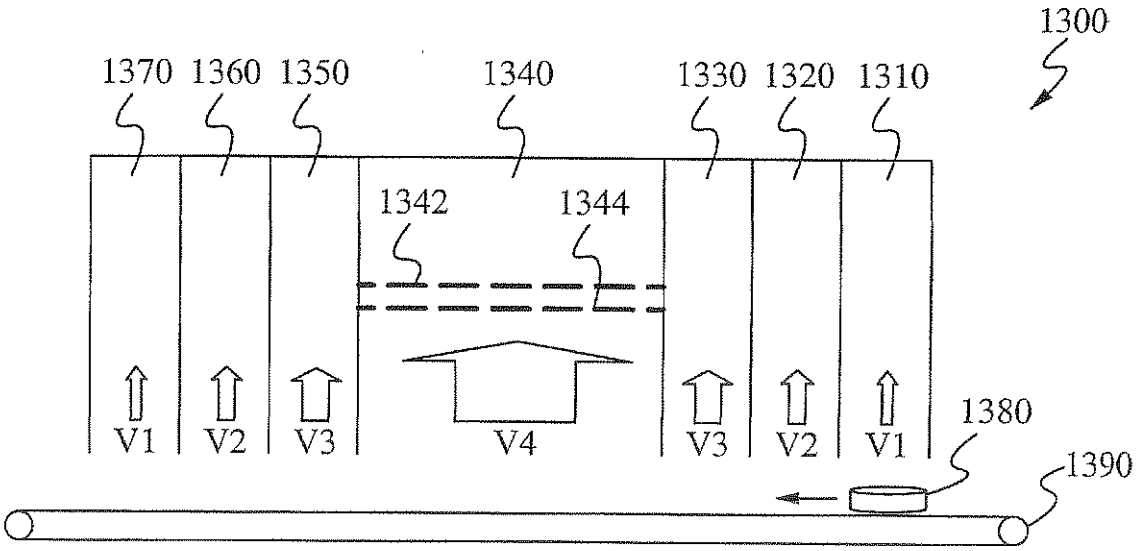

1300
1370
1360
1350
1340
1330
1320
1310
1342
1344
V1
V2
V3
V4
V3
V2
V1
1380
1390

Fig. 13

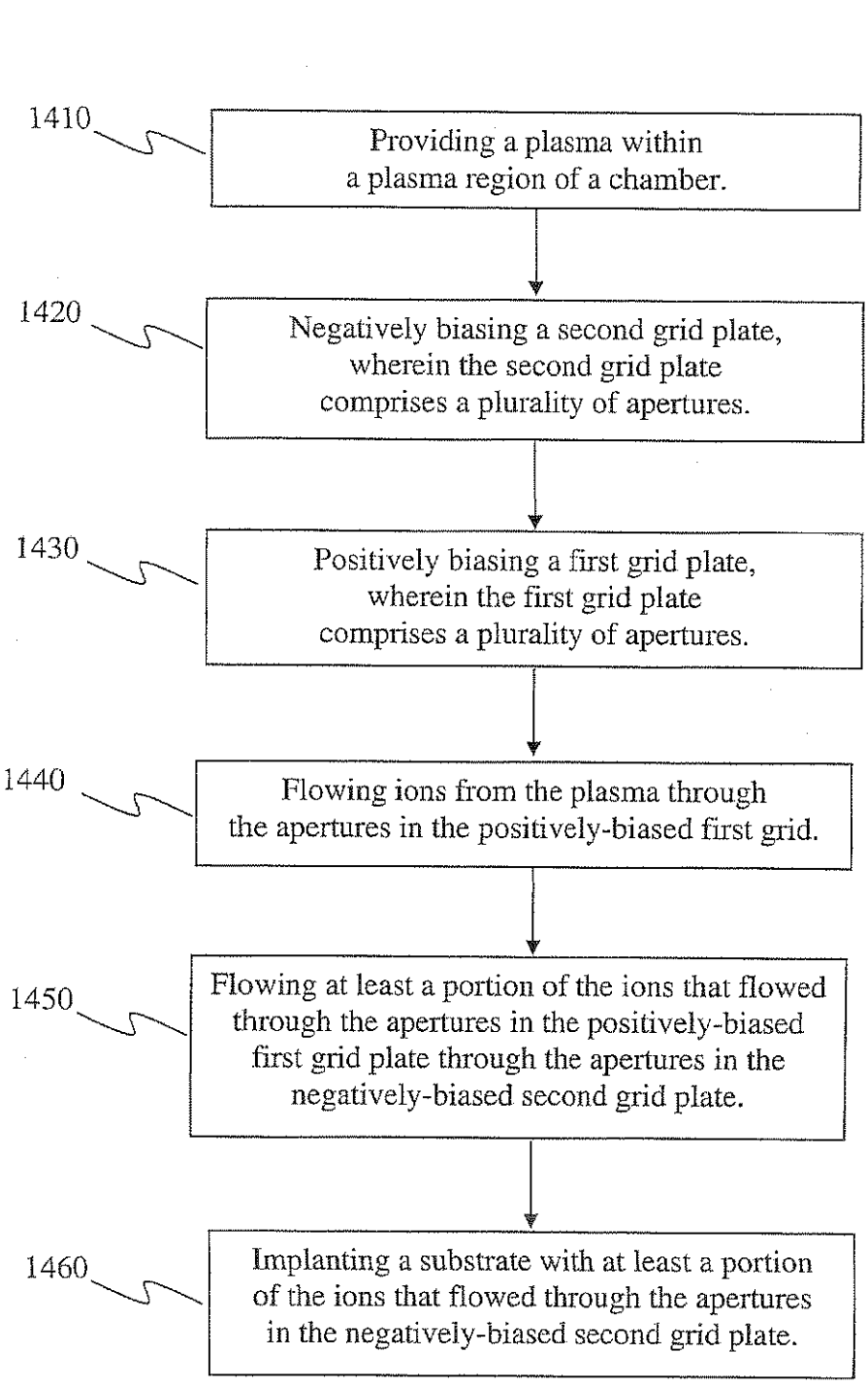

1400
1410
Providing a plasma within a plasma region of a chamber.
1420
Negatively biasing a second grid plate, wherein the second grid plate comprises a plurality of apertures.
1430
Positively biasing a first grid plate, wherein the first grid plate comprises a plurality of apertures.
1440
Flowing ions from the plasma through the apertures in the positively-biased first grid.
1450
Flowing at least a portion of the ions that flowed through the apertures in the positively-biased first grid plate through the apertures in the negatively-biased second grid plate.
1460
Implanting a substrate with at least a portion of the ions that flowed through the apertures in the negatively-biased second grid plate.

FIG. 14

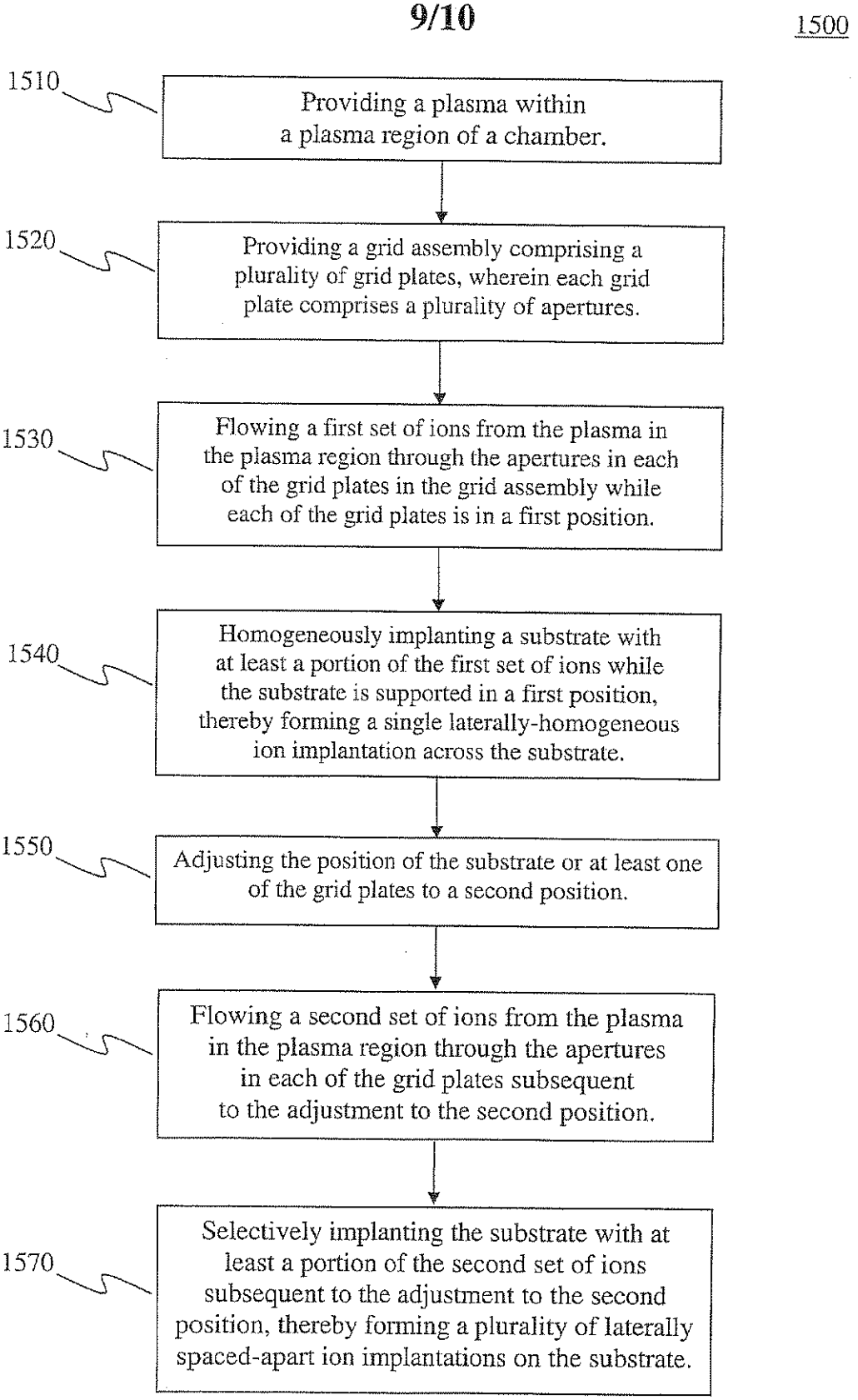

1500
1510
Providing a plasma within a plasma region of a chamber.
1520
Providing a grid assembly comprising a plurality of grid plates, wherein each grid plate comprises a plurality of apertures.
1530
Flowing a first set of ions from the plasma in the plasma region through the apertures in each of the grid plates in the grid assembly while each of the grid plates is in a first position.
1540
Homogeneously implanting a substrate with at least a portion of the first set of ions while the substrate is supported in a first position, thereby forming a single laterally-homogeneous ion implantation across the substrate.
1550
Adjusting the position of the substrate or at least one of the grid plates to a second position.
1560
Flowing a second set of ions from the plasma in the plasma region through the apertures in each of the grid plates subsequent to the adjustment to the second position.
1570
Selectively implanting the substrate with at least a portion of the second set of ions subsequent to the adjustment to the second position, thereby forming a plurality of laterally spaced-apart ion implantations on the substrate.

FIG. 15

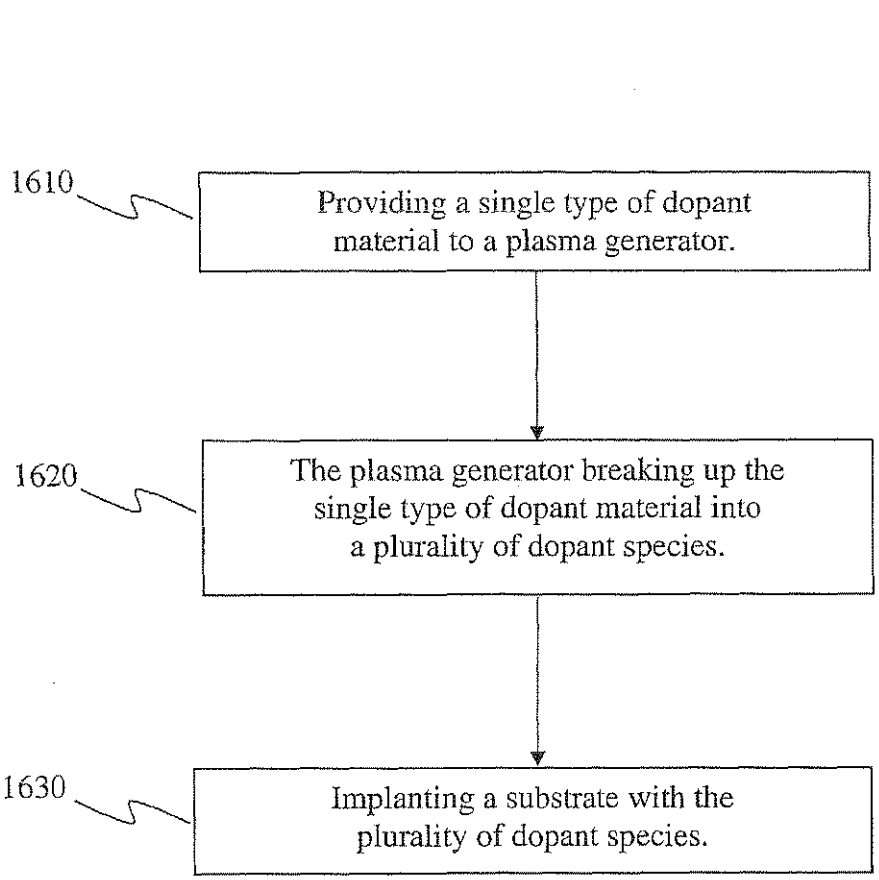

1600
1610
Providing a single type of dopant material to a plasma generator.
1620
The plasma generator breaking up the single type of dopant material into a plurality of dopant species.
1630
Implanting a substrate with the plurality of dopant species.

FIG. 16