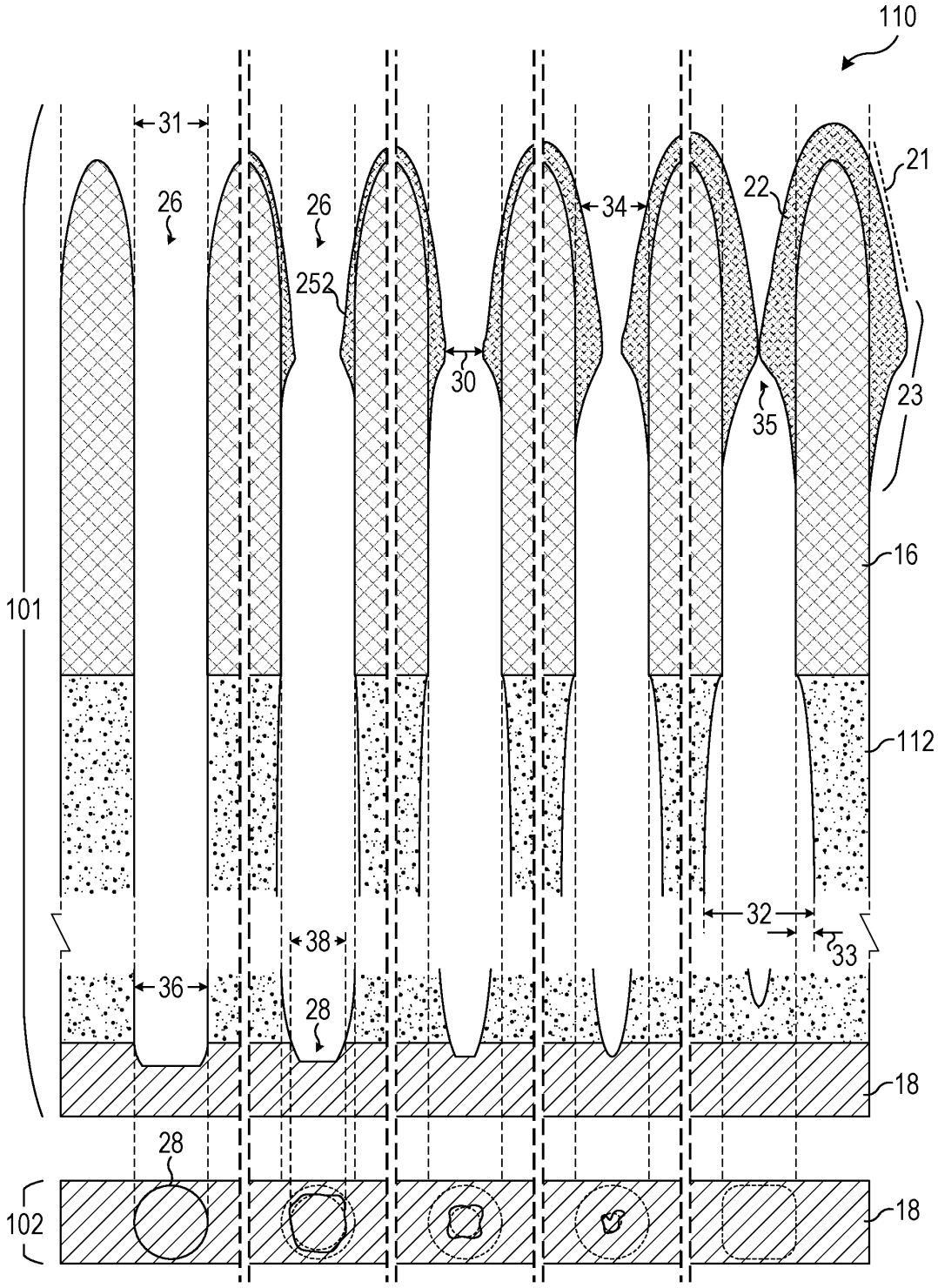

110
31
26
26
252
34
22
21
30
35
23
16
101
112
32
33
38
36
28
18
28
102
18

Fig. 1

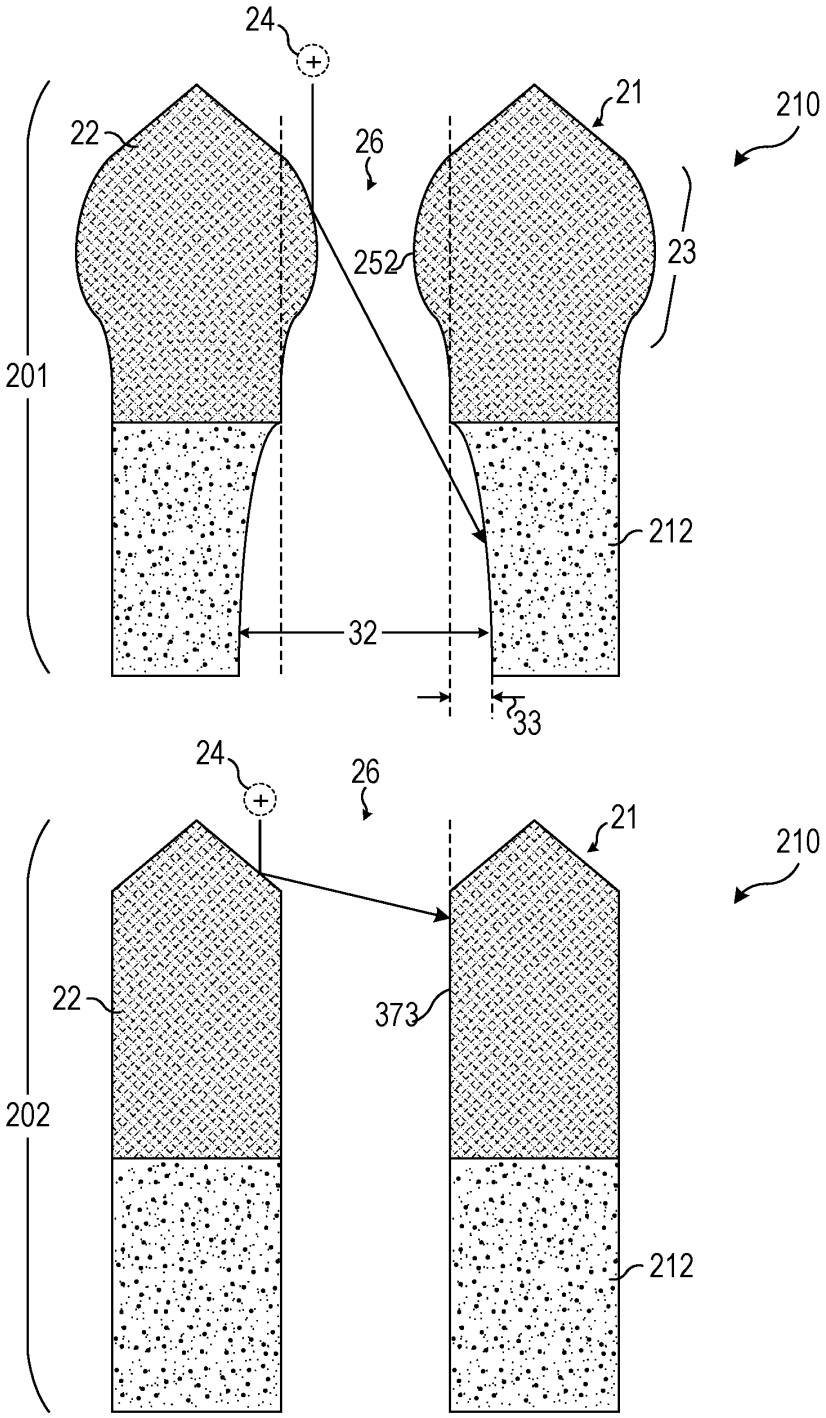


Fig. 2

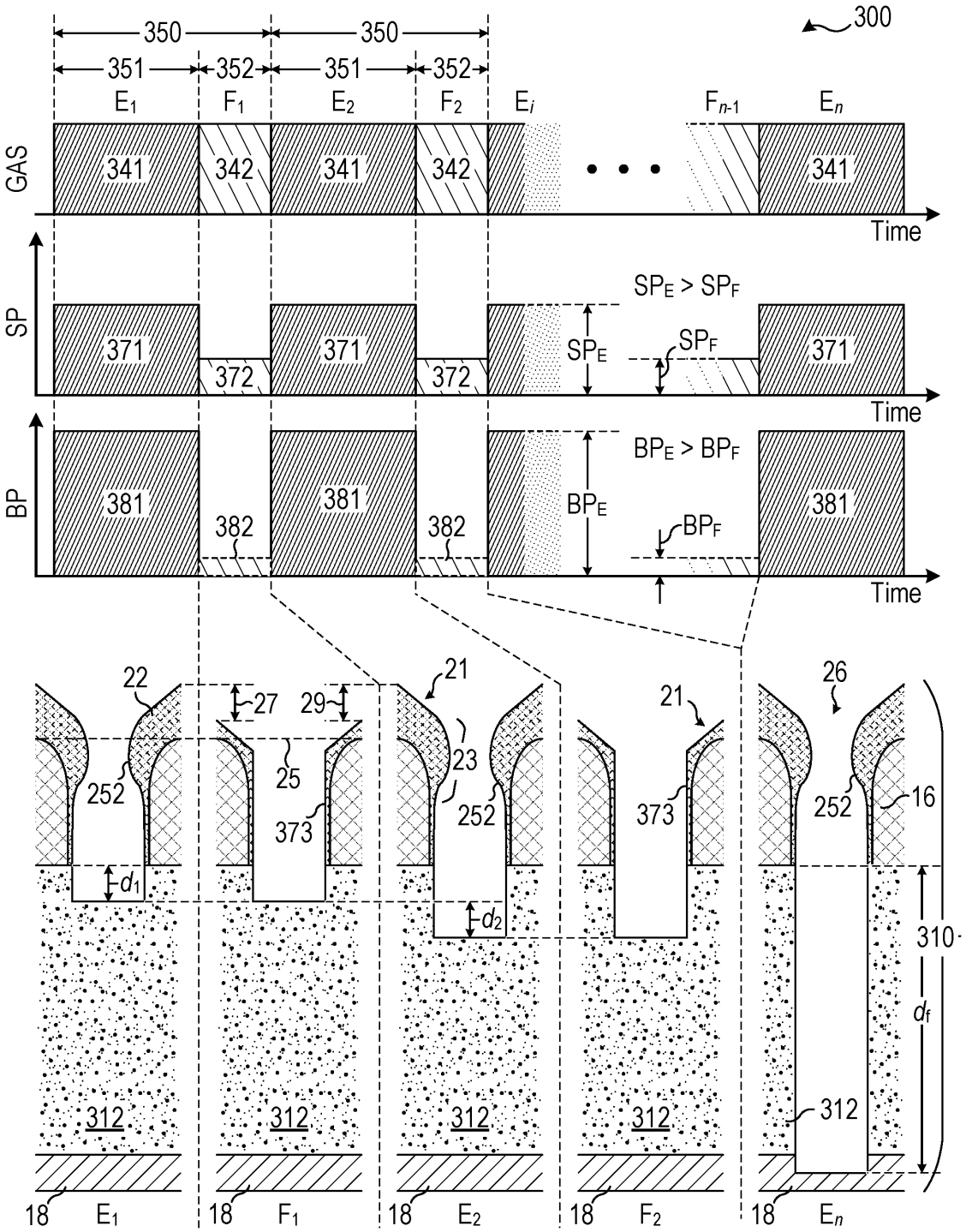

300
350
350
351
352
351
352
E1
F1
E2
F2
Ei
Fn-1
En
GAS
341
342
341
342
341
Time
SP
SPE > SPF
371
372
371
372
SPE
SPF
371
Time
BP
BPE > BPF
381
382
381
382
BPE
BPF
381
Time
22
27
29
21
23
25
252
373
252
d1
d2
21
373
26
252
16
310
df
312
312
312
312
312
18
E1
18
F1
18
E2
18
F2
18
En

Fig. 3

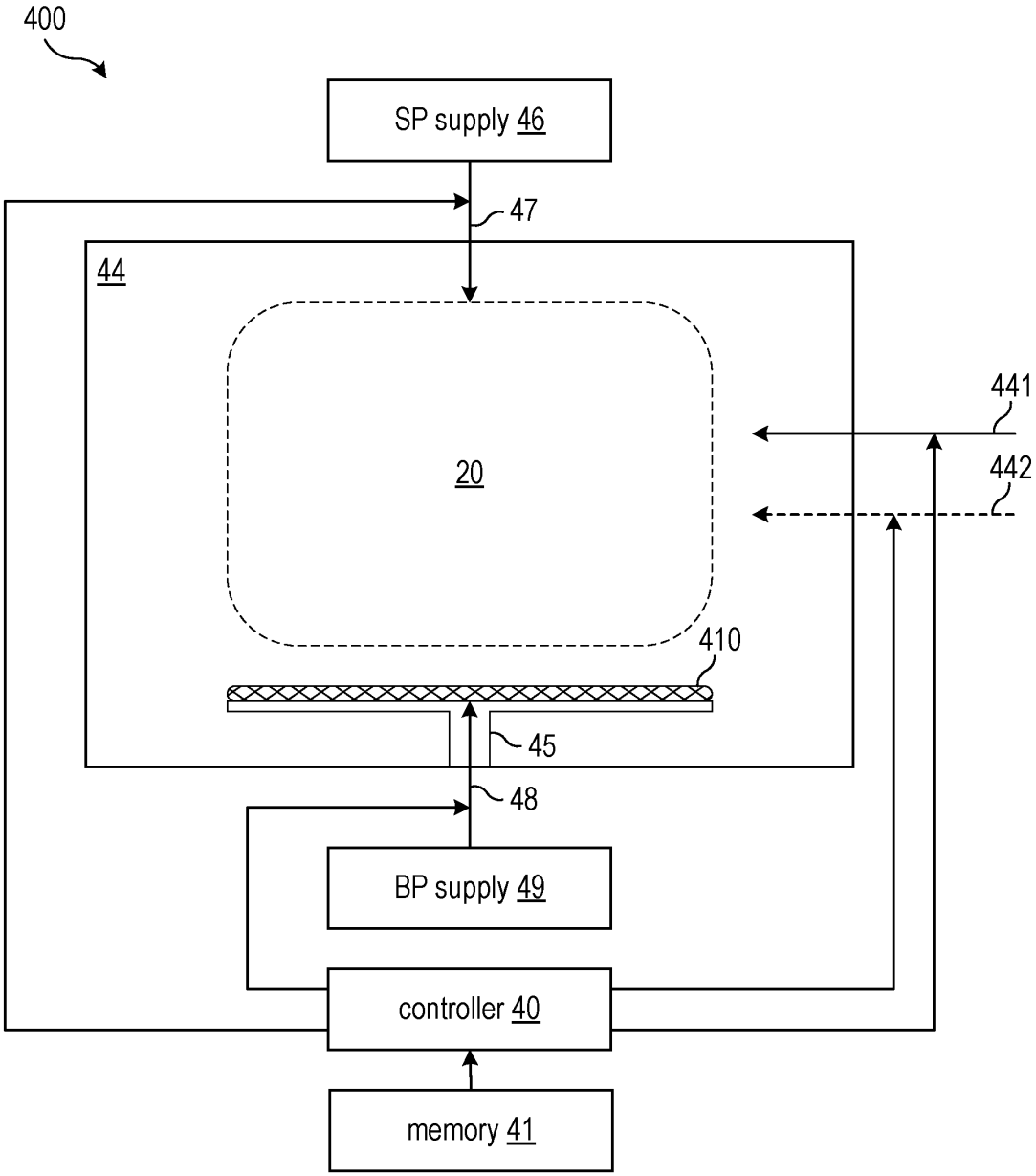

400
SP supply 46
47
44
20
441
442
410
45
48
BP supply 49
controller 40
memory 41

Fig. 4

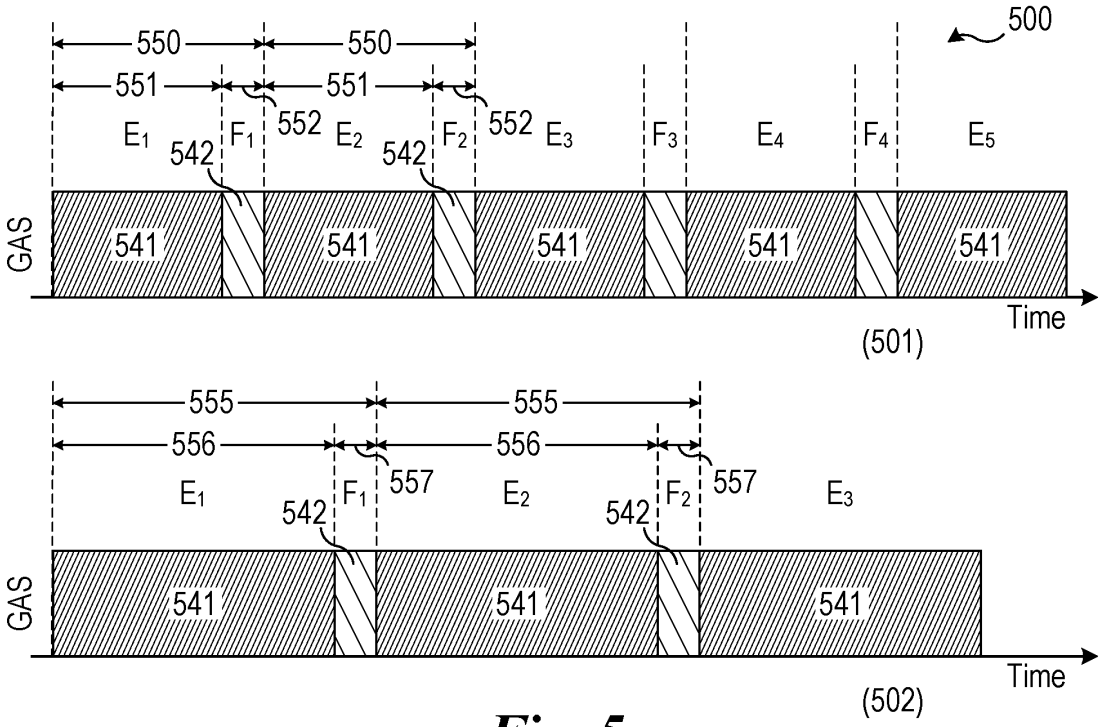

500
550
550
551
551
552
552
E1
F1
E2
F2
E3
F3
E4
F4
E5
542
542
GAS
541
541
541
541
541
Time
(501)
555
555
556
556
557
557
E1
F1
E2
F2
E3
542
542
GAS
541
541
541
Time
(502)

Fig. 5

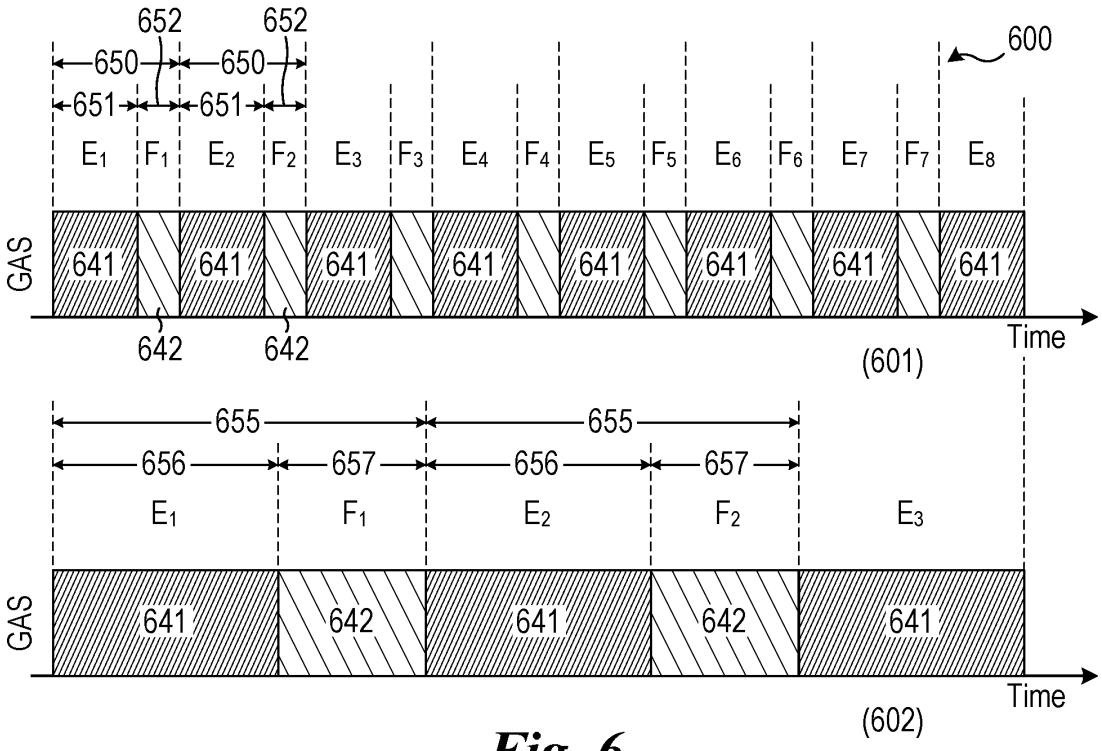

652
652
650
650
651
651
600
E1
F1
E2
F2
E3
F3
E4
F4
E5
F5
E6
F6
E7
F7
E8
GAS
641
641
641
641
641
641
641
641
642
642
Time
(601)
655
655
656
657
656
657
E1
F1
E2
F2
E3
GAS
641
642
641
642
641
Time
(602)

Fig. 6

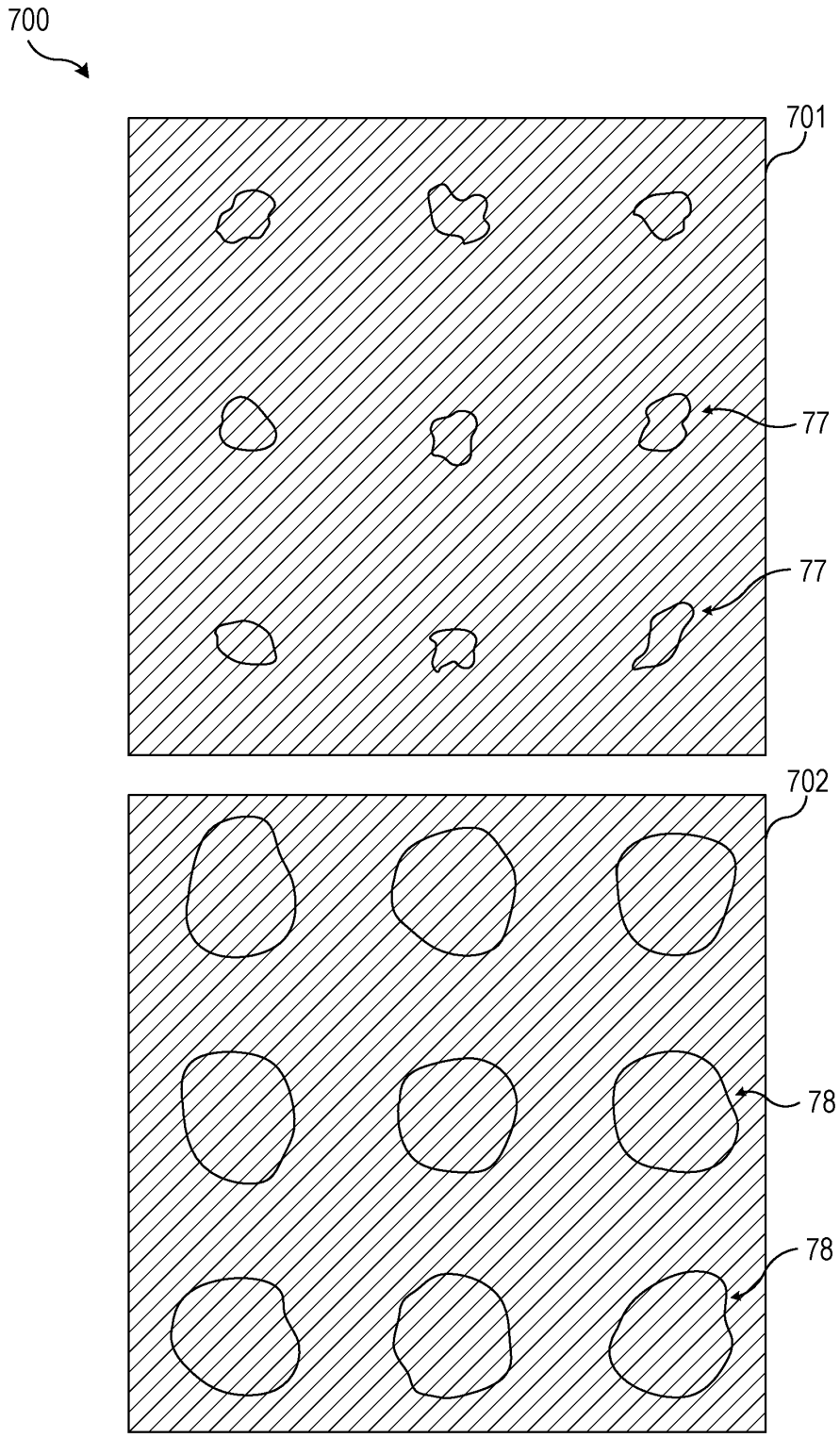


Fig. 7

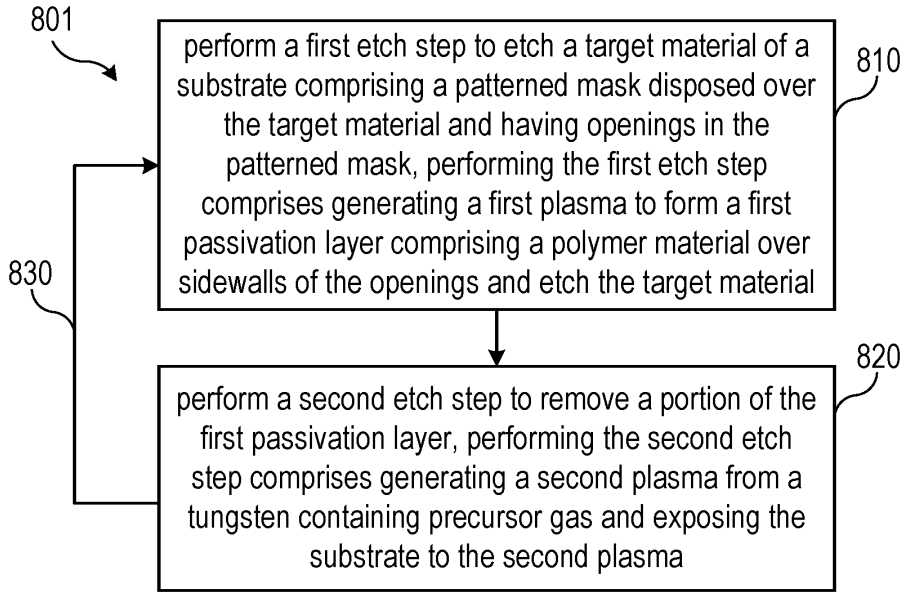

801
perform a first etch step to etch a target material of a substrate comprising a patterned mask disposed over the target material and having openings in the patterned mask, performing the first etch step comprises generating a first plasma to form a first passivation layer comprising a polymer material over sidewalls of the openings and etch the target material
810
830
perform a second etch step to remove a portion of the first passivation layer, performing the second etch step comprises generating a second plasma from a tungsten containing precursor gas and exposing the substrate to the second plasma
820

Fig. 8A

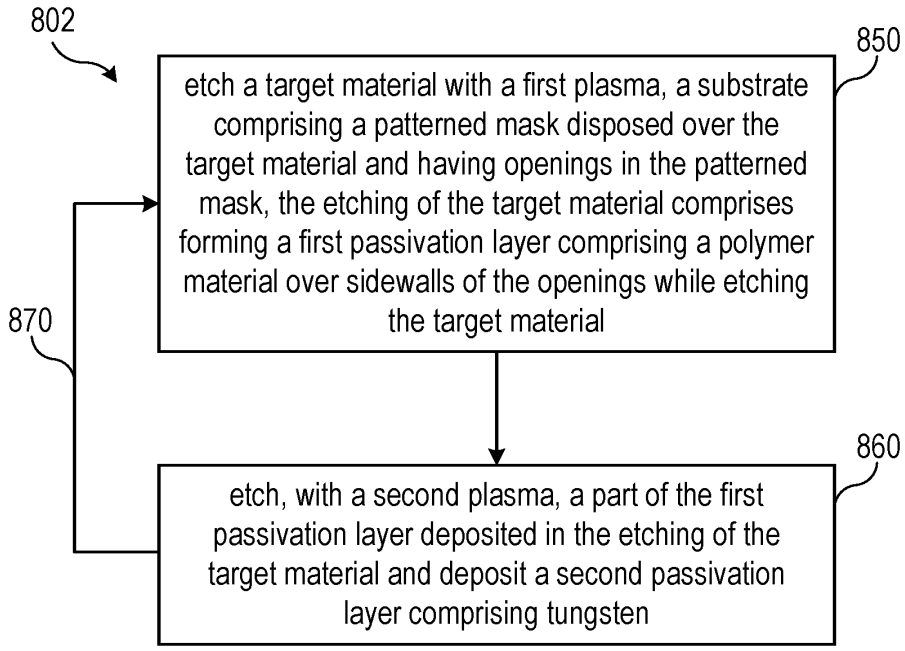

802
etch a target material with a first plasma, a substrate comprising a patterned mask disposed over the target material and having openings in the patterned mask, the etching of the target material comprises forming a first passivation layer comprising a polymer material over sidewalls of the openings while etching the target material
850
870
etch, with a second plasma, a part of the first passivation layer deposited in the etching of the target material and deposit a second passivation layer comprising tungsten
860

Fig. 8B