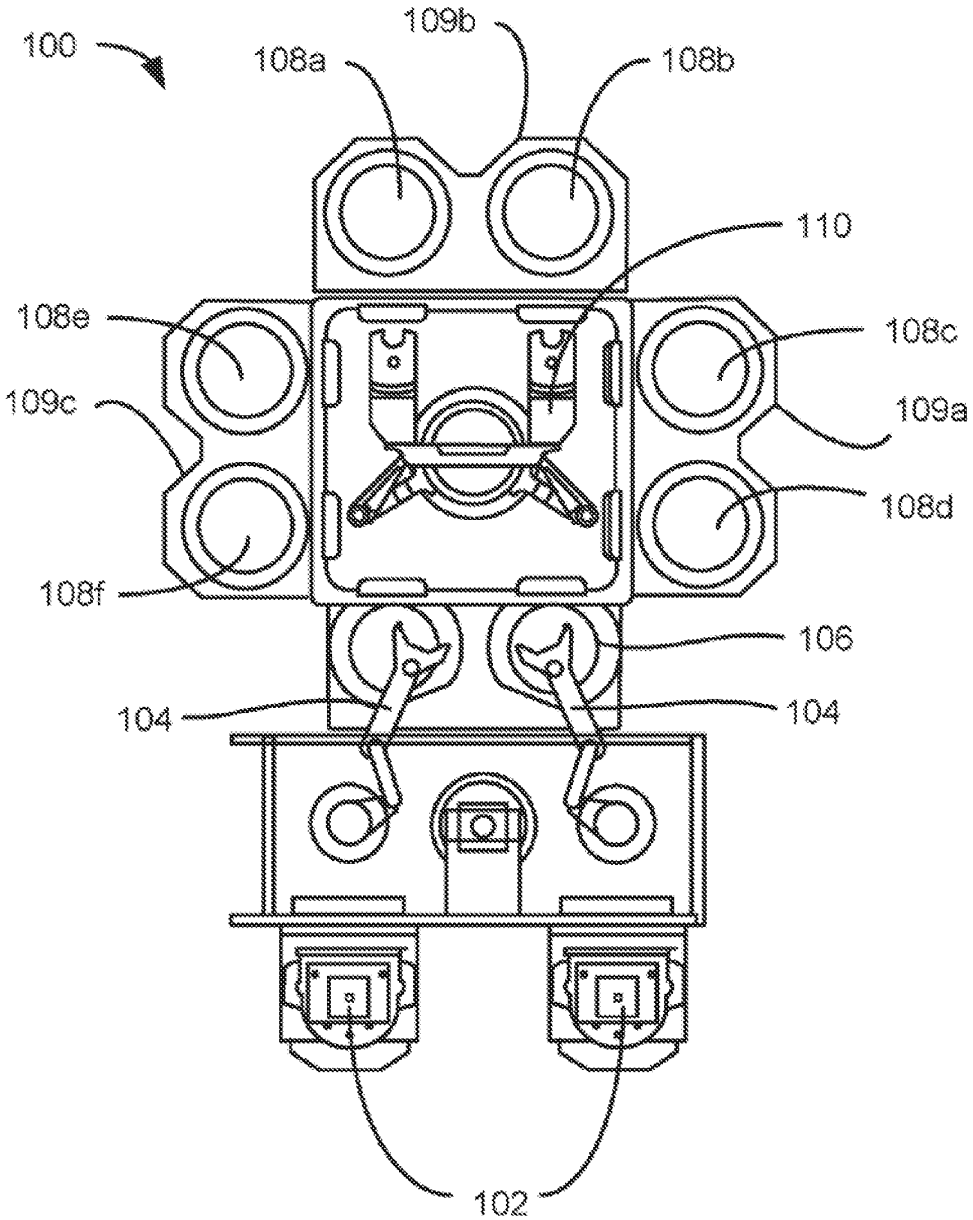
100
109b
108a
108b
110
108e
108c
109c
109a
108d
108f
106
104
104
102

FIG. 1

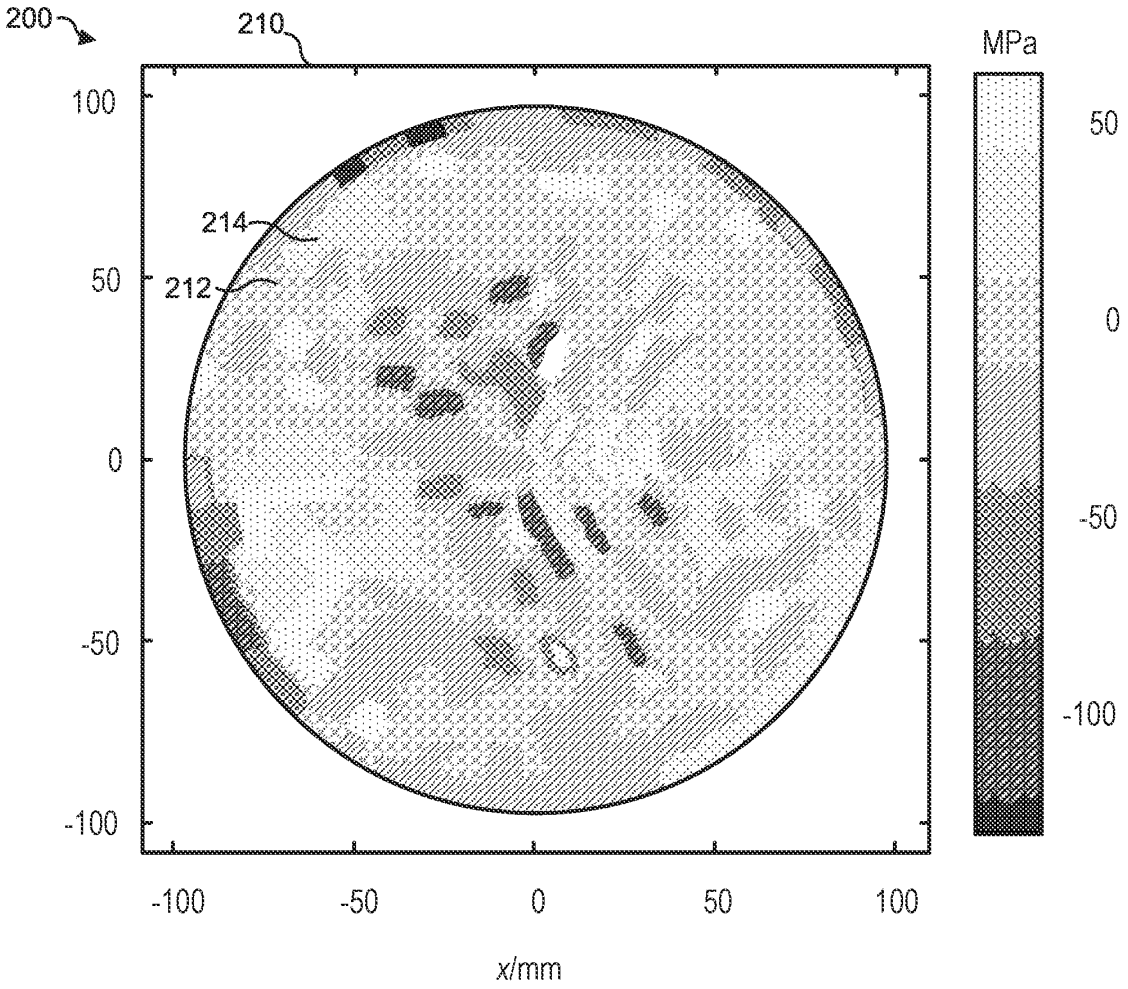
200
210
MPa
100
50
0
-50
-100
214
212
50
0
-50
-100
-100
-50
0
50
100
x/mm

FIG. 2A

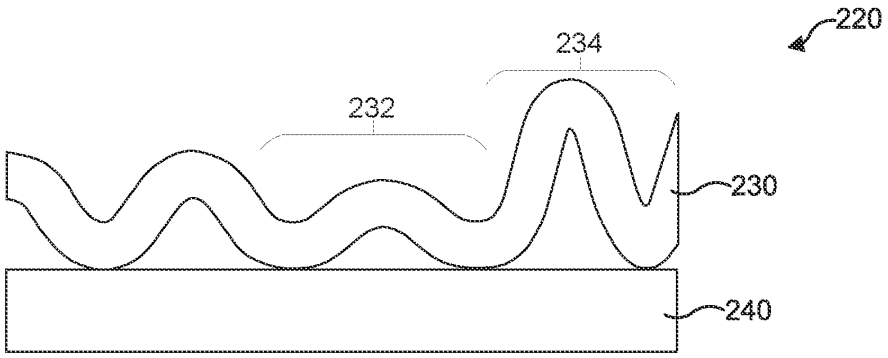
220
234
232
230
240

FIG. 2B

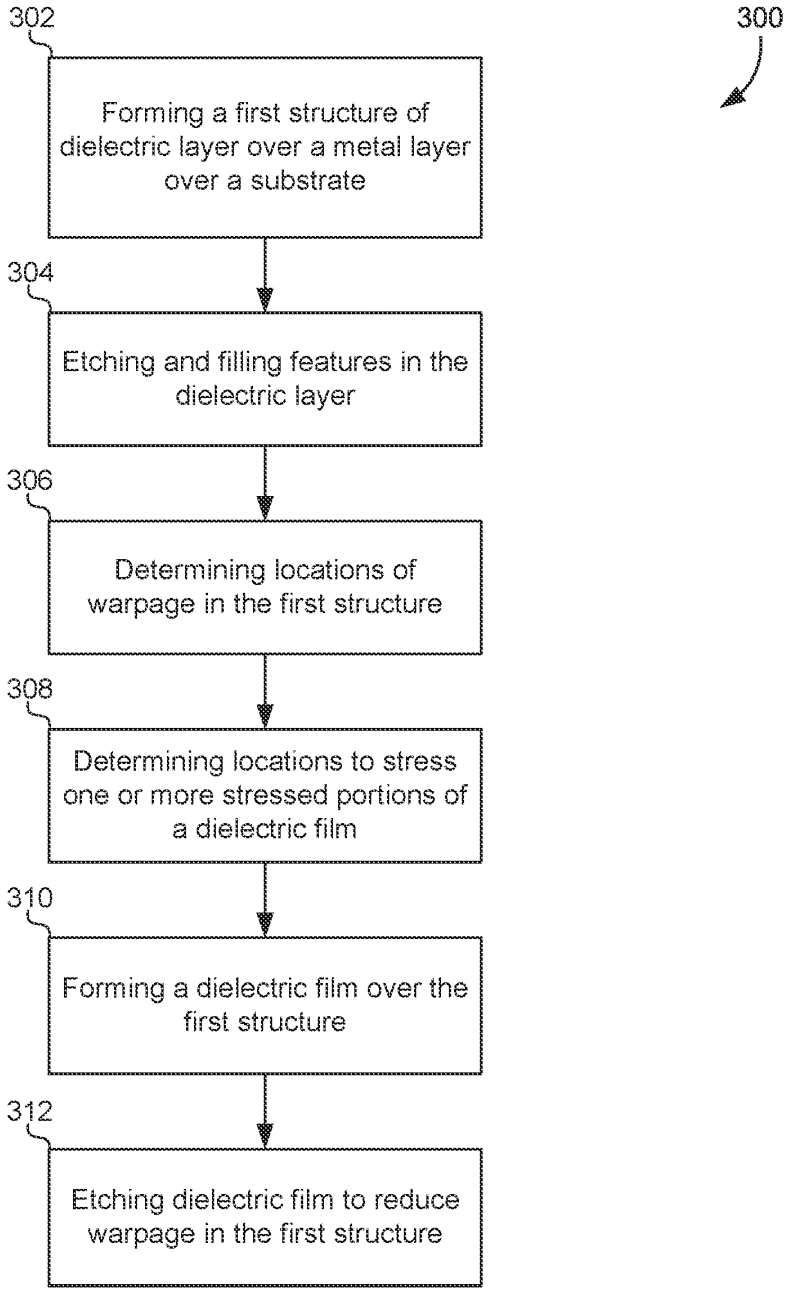
300
302
Forming a first structure of dielectric layer over a metal layer over a substrate
304
Etching and filling features in the dielectric layer
306
Determining locations of warpage in the first structure
308
Determining locations to stress one or more stressed portions of a dielectric film
310
Forming a dielectric film over the first structure
312
Etching dielectric film to reduce warpage in the first structure

FIG. 3

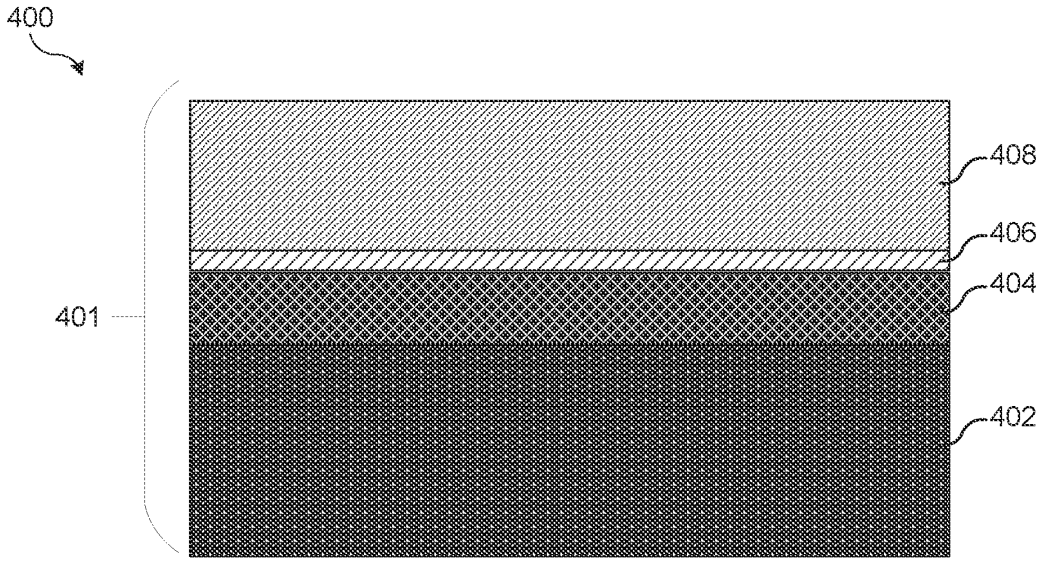

FIG. 4A

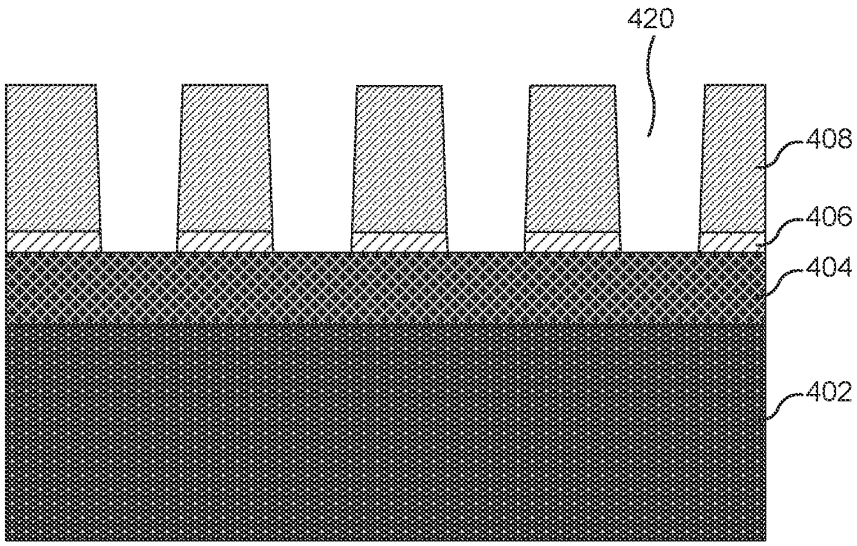

FIG. 4B

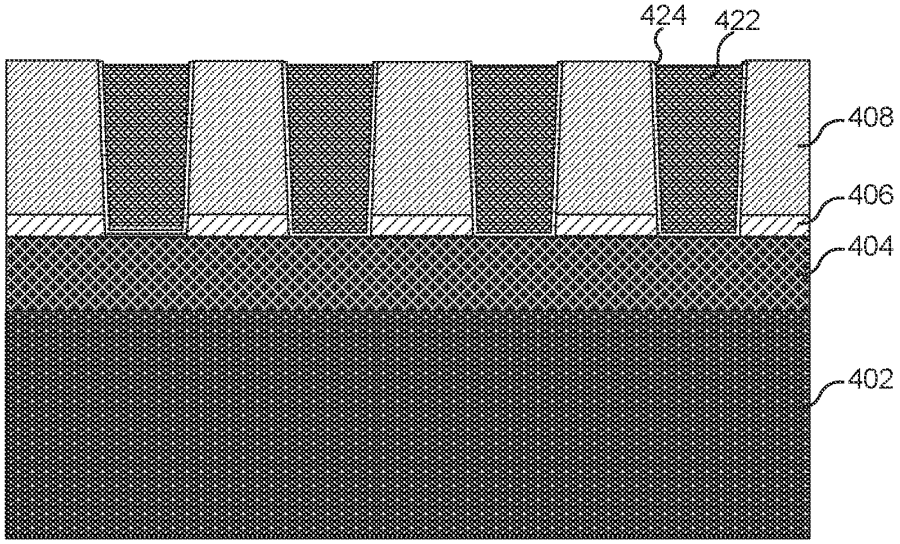

FIG. 4C

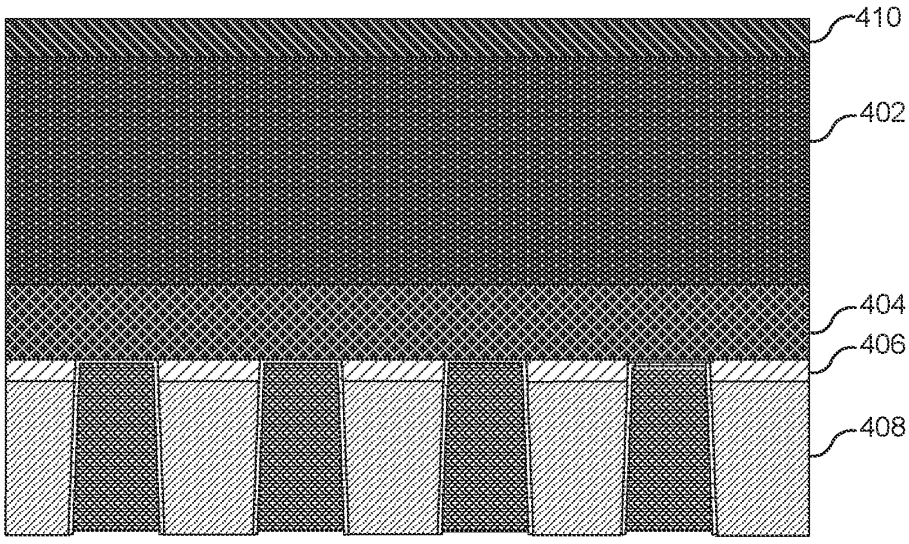

FIG. 4D

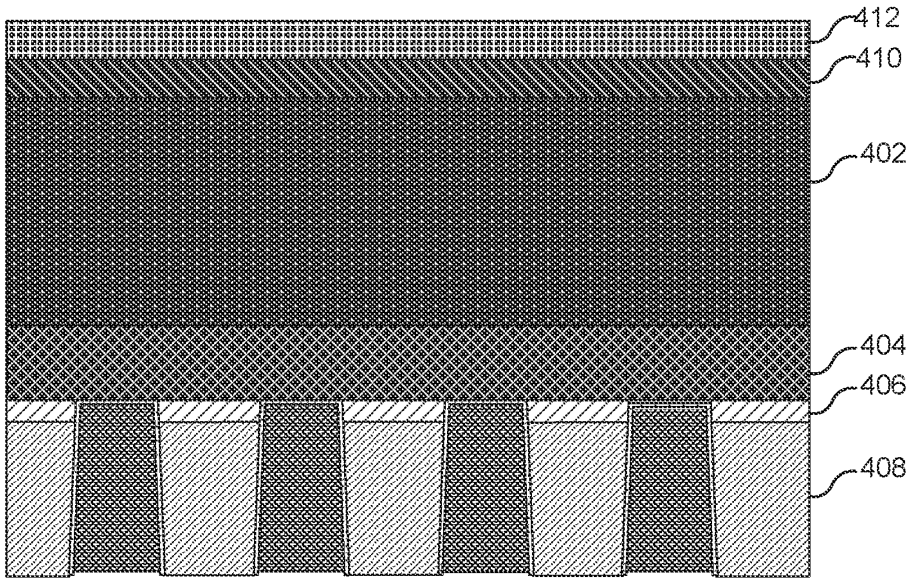

FIG. 4E

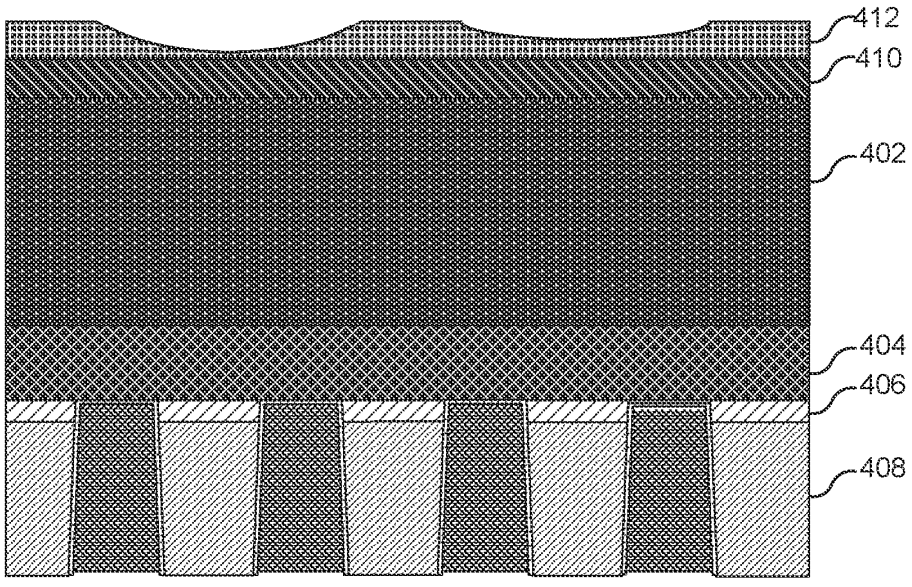

FIG. 4F

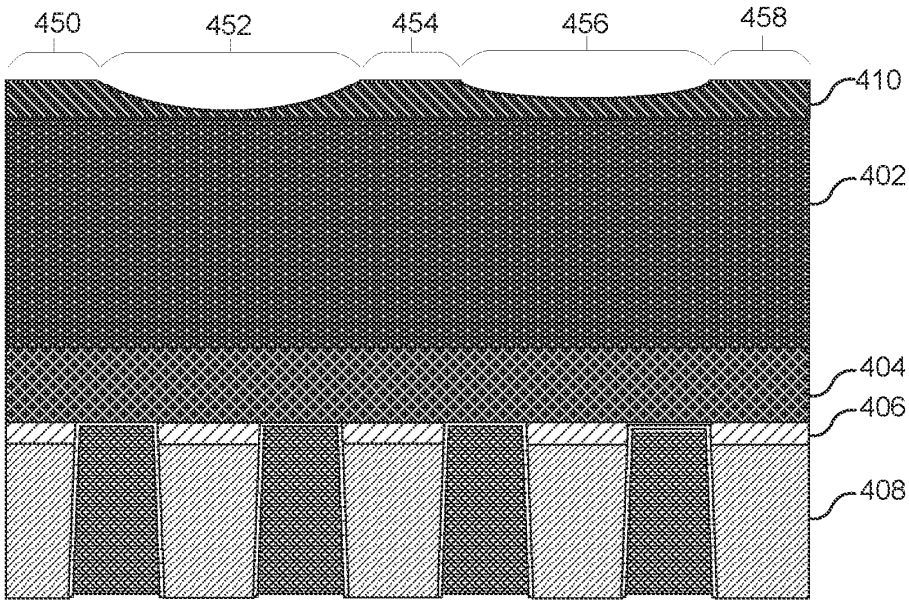
450
452
454
456
458
410
402
404
406
408

FIG. 4G

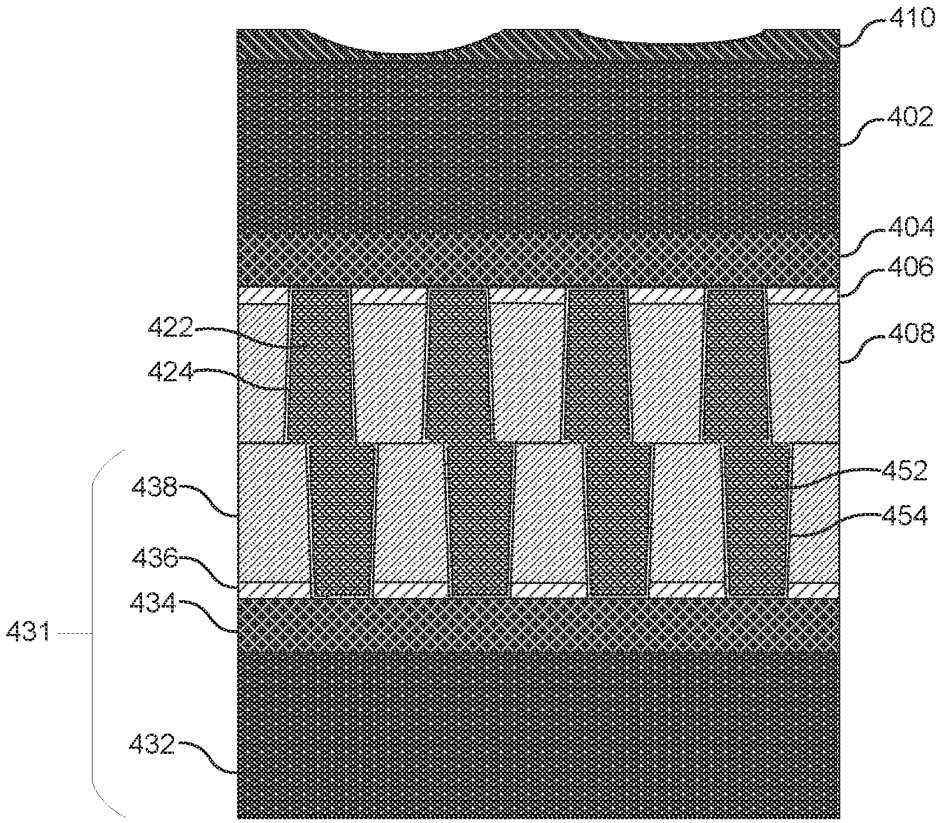
410
402
404
406
422
424
408
438
452
454
436
434
431
432

FIG. 4H

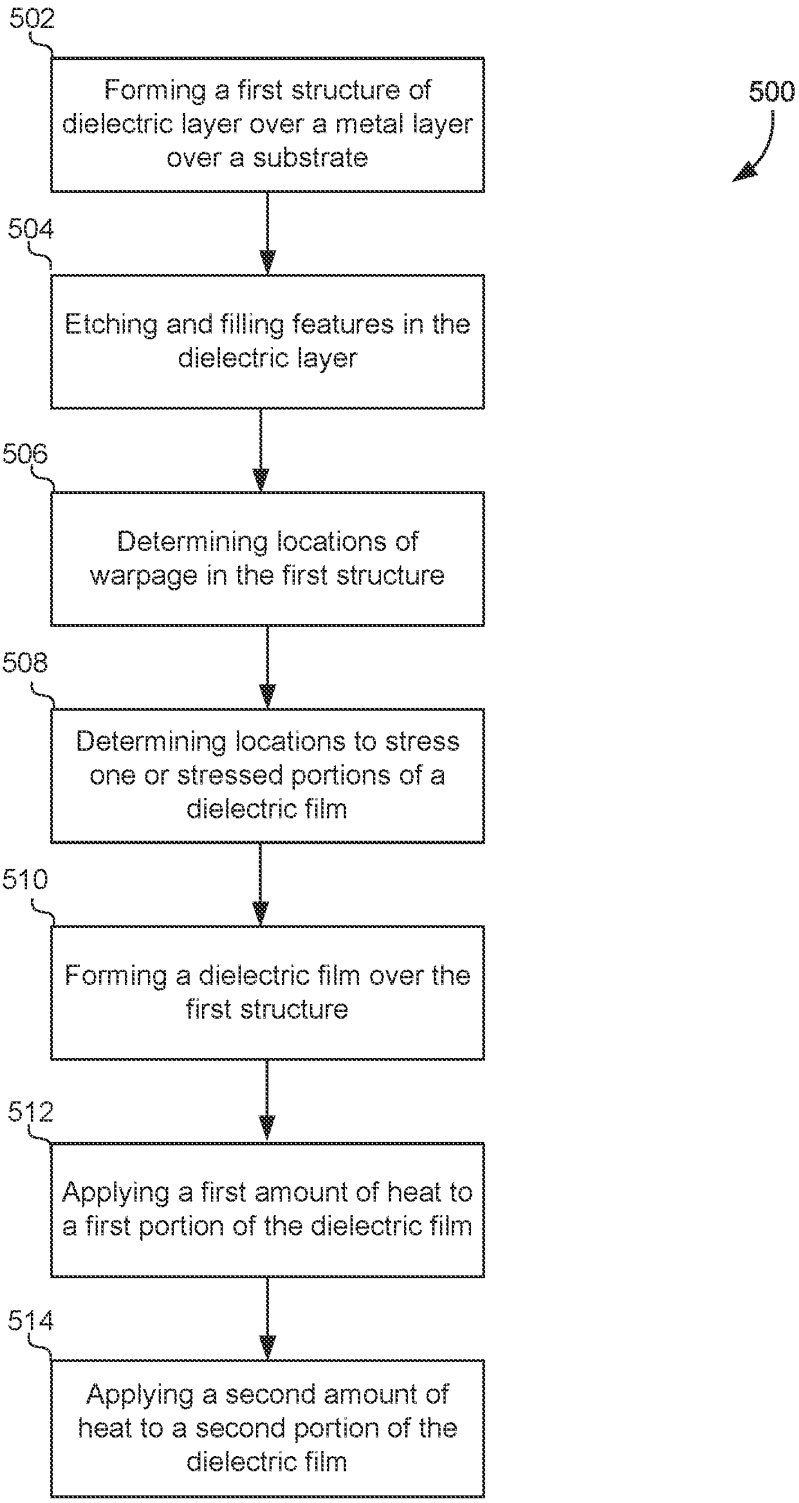
502
Forming a first structure of dielectric layer over a metal layer over a substrate
500
504
Etching and filling features in the dielectric layer
506
Determining locations of warpage in the first structure
508
Determining locations to stress one or stressed portions of a dielectric film
510
Forming a dielectric film over the first structure
512
Applying a first amount of heat to a first portion of the dielectric film
514
Applying a second amount of heat to a second portion of the dielectric film

FIG. 5

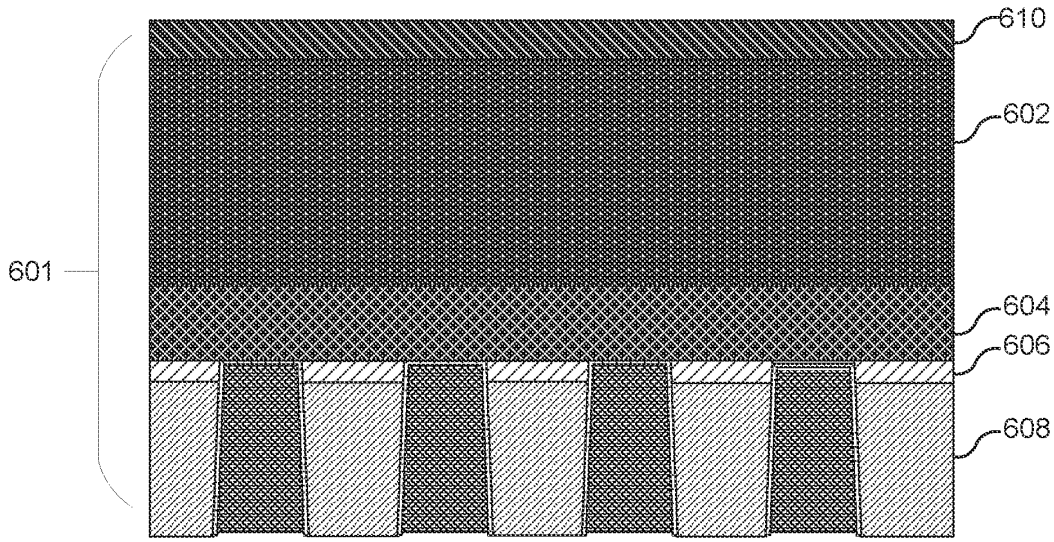

FIG. 6A

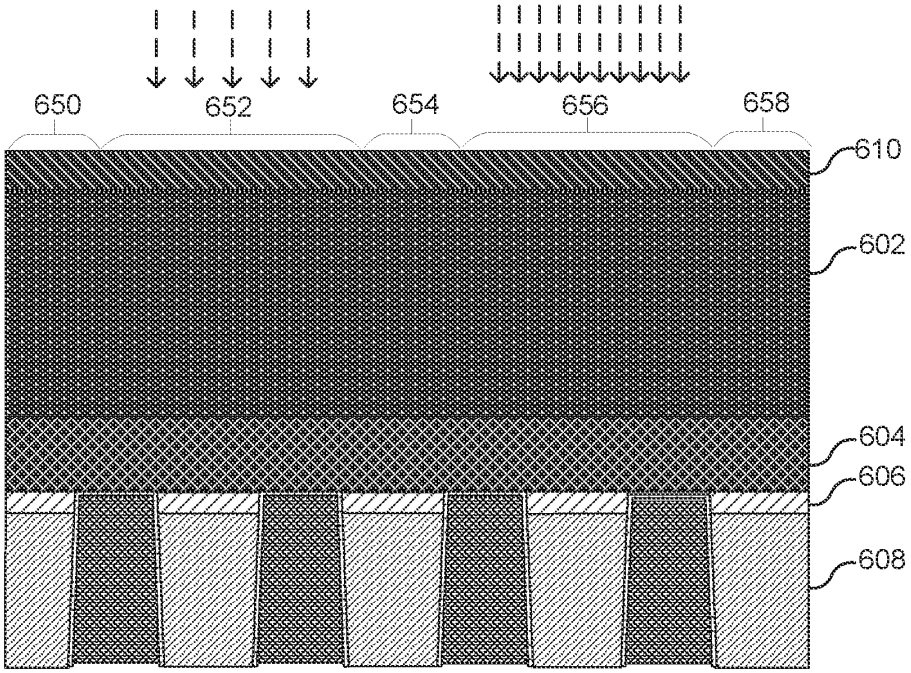

FIG. 6B

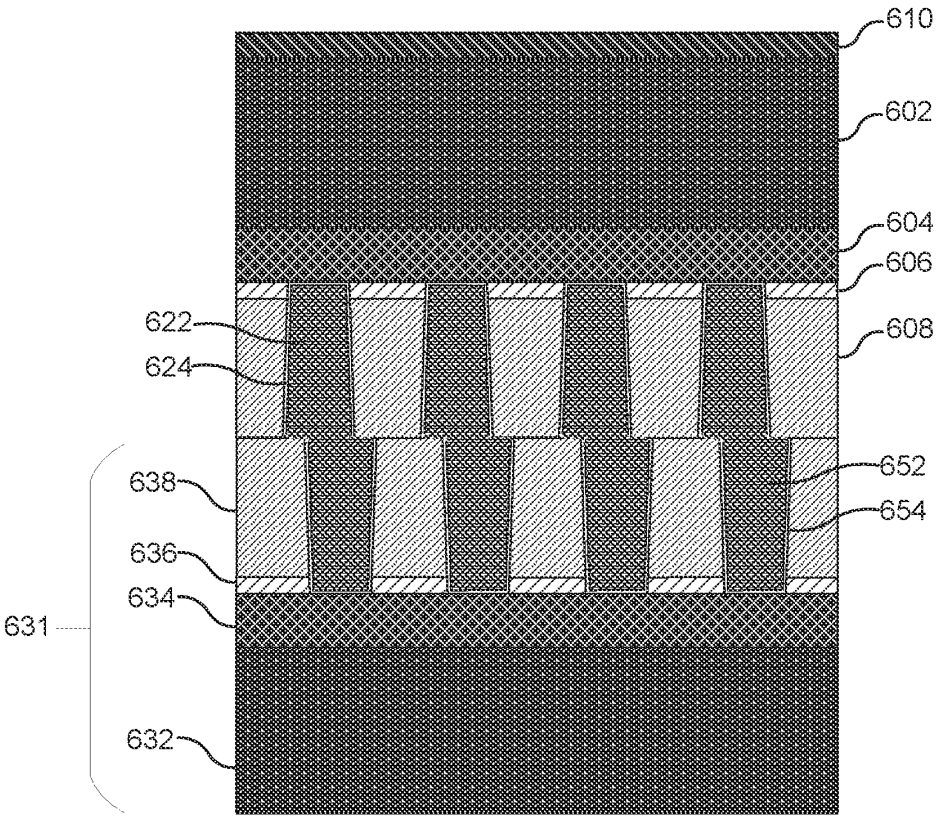

FIG. 6C

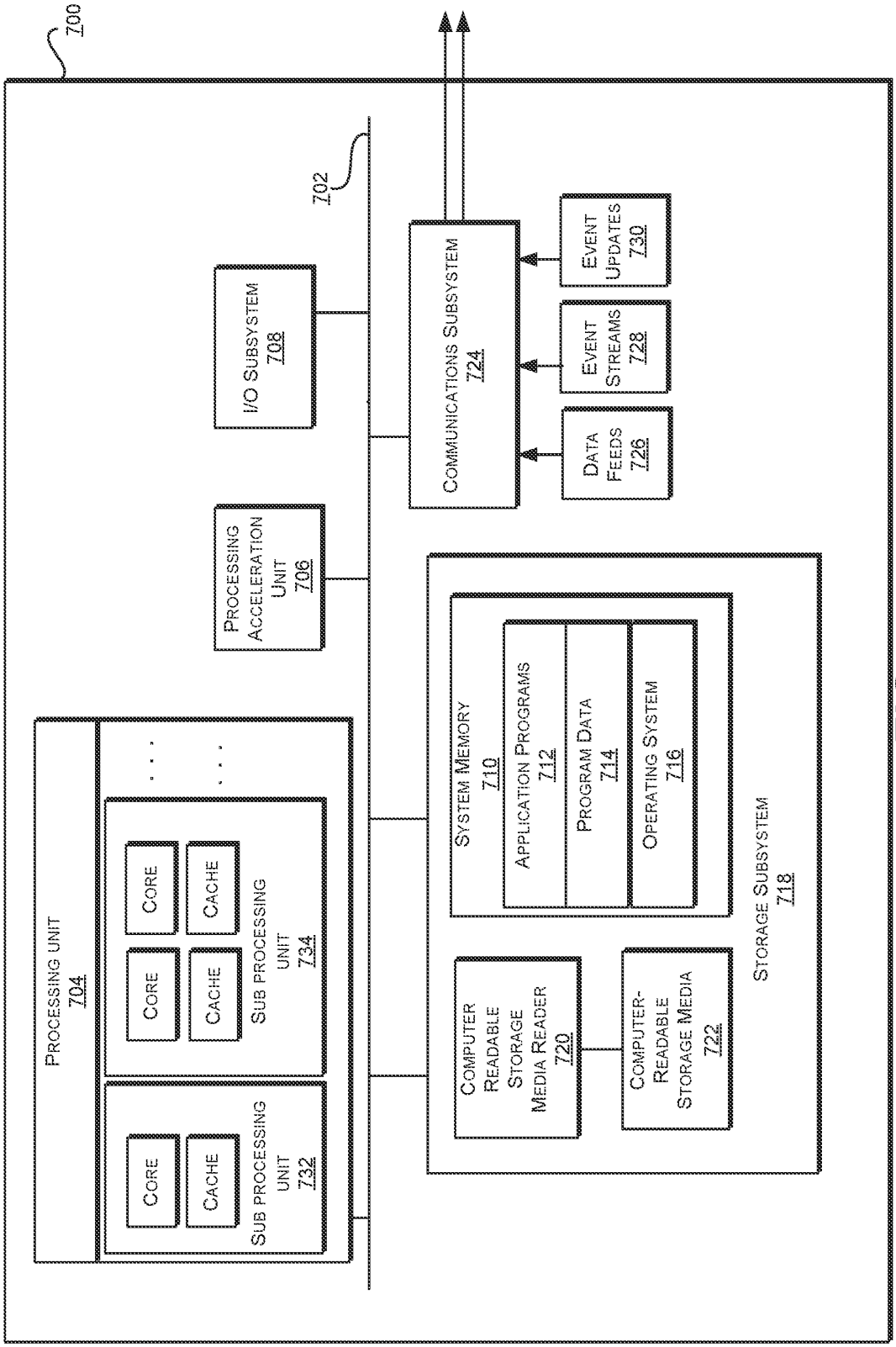
700
702
I/O Subsystem 708
Communications Subsystem 724
Event Updates 730
Event Streams 728
Data Feeds 726
Processing Acceleration Unit 706
Processing Unit 704
Core
Cache
Sub Processing Unit 734
Sub Processing Unit 732
System Memory 710
Application Programs 712
Program Data 714
Operating System 716
Storage Subsystem 718
Computer Readable Storage Media Reader 720
Computer-Readable Storage Media 722

FIG. 7