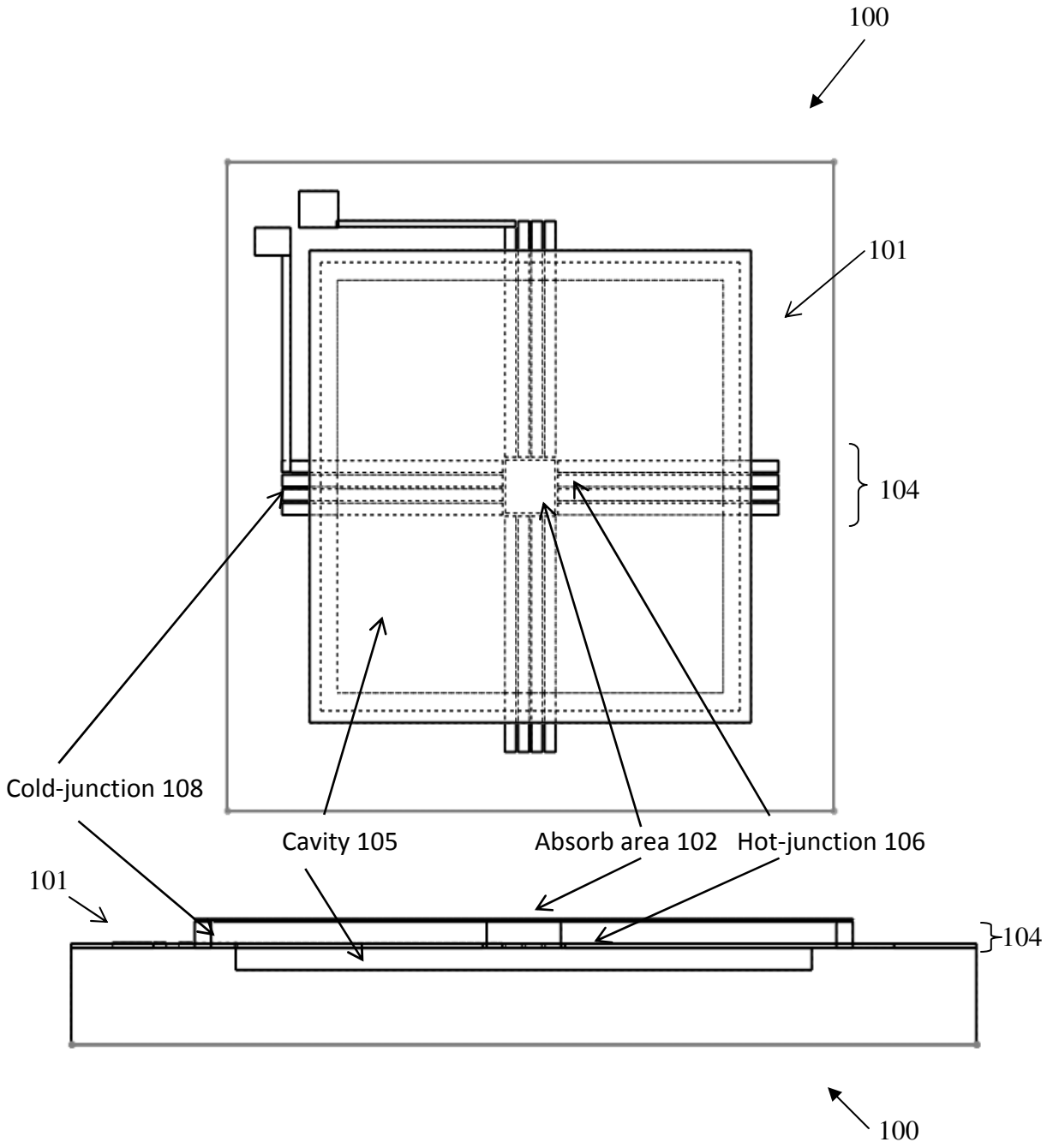

100
101
104
Cold-junction 108
Cavity 105
Absorb area 102
Hot-junction 106
101
104
100

FIG. 1

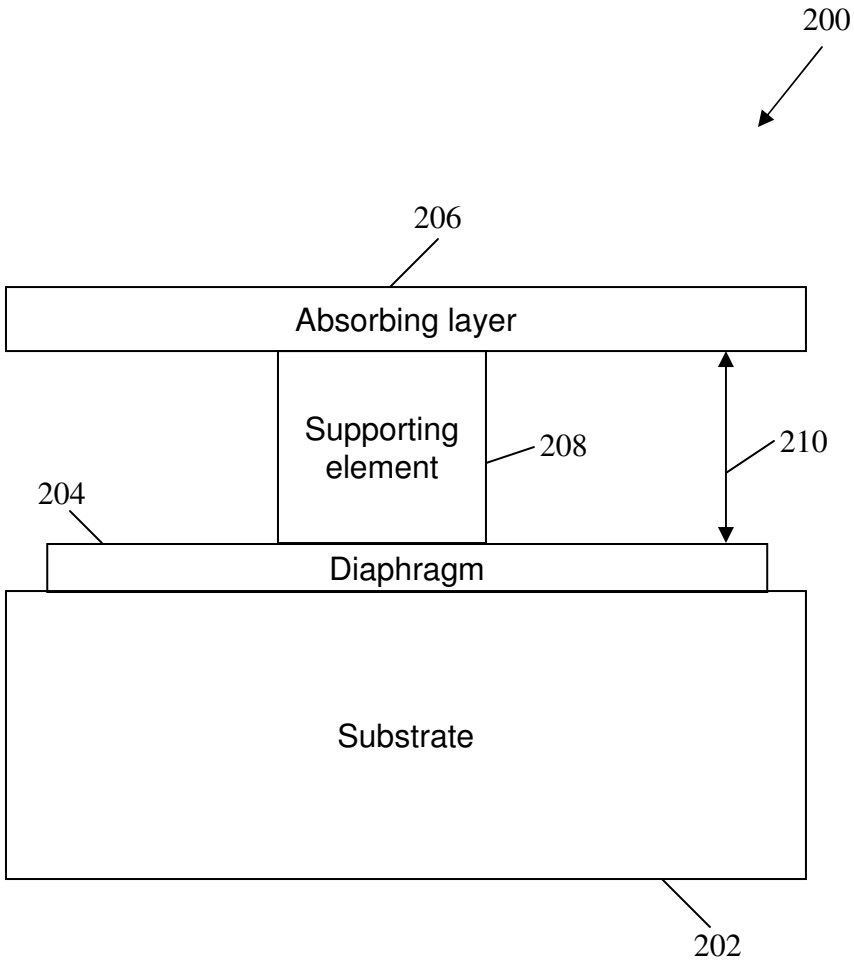

200
206
Absorbing layer
Supporting element
208
210
204
Diaphragm
Substrate
202

FIG. 2

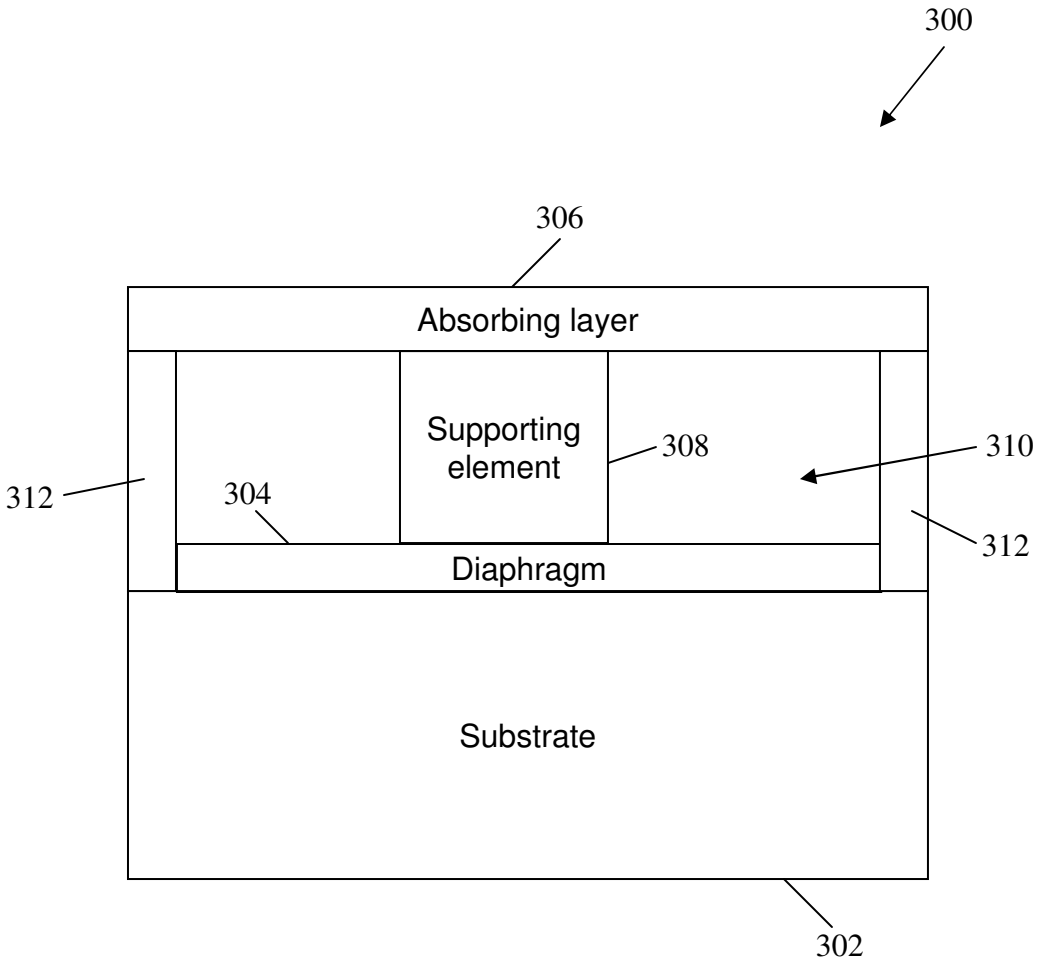

300
306
Absorbing layer
Supporting element
308
310
312
304
312
Diaphragm
Substrate
302

FIG. 3

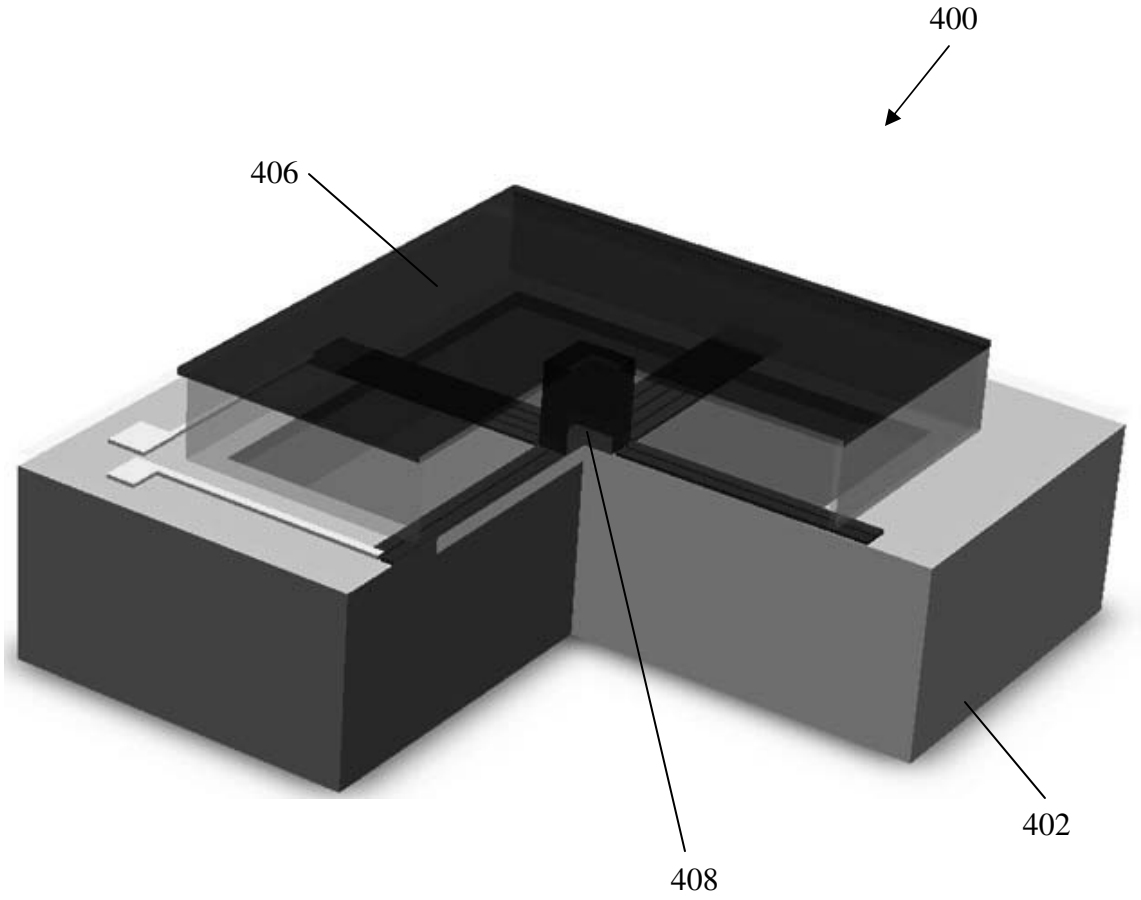


FIG. 4a

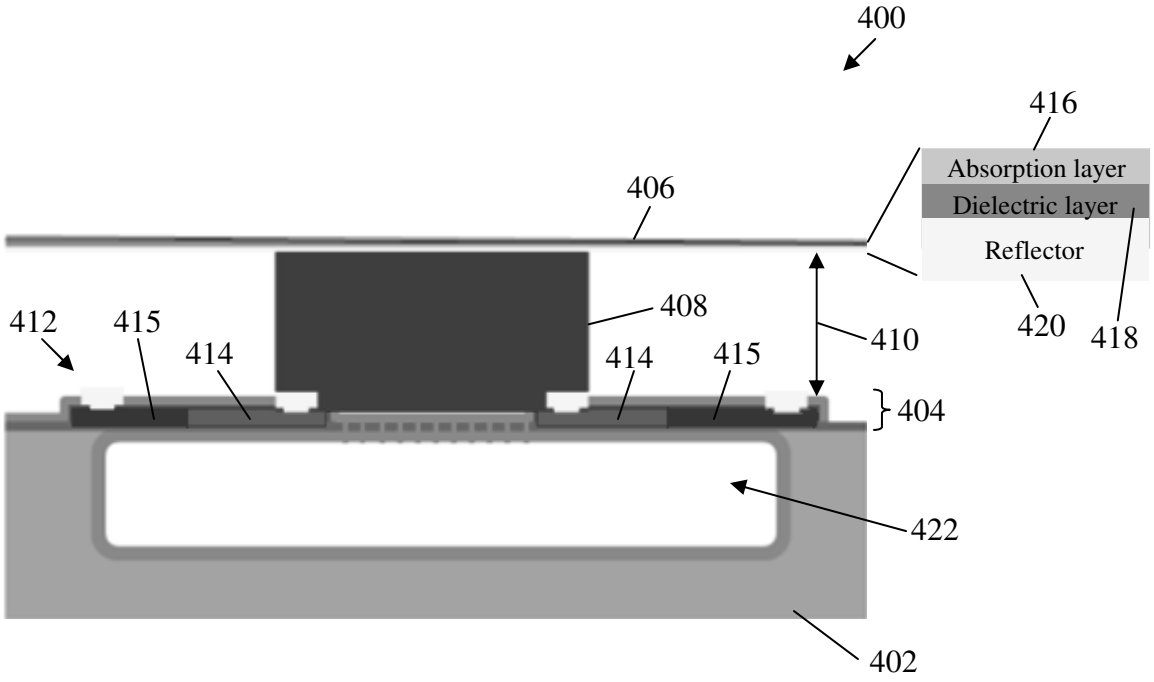

400
416
Absorption layer
Dielectric layer
Reflector
406
408
410
420
418
412
415
414
414
415
404
422
402

FIG. 4b

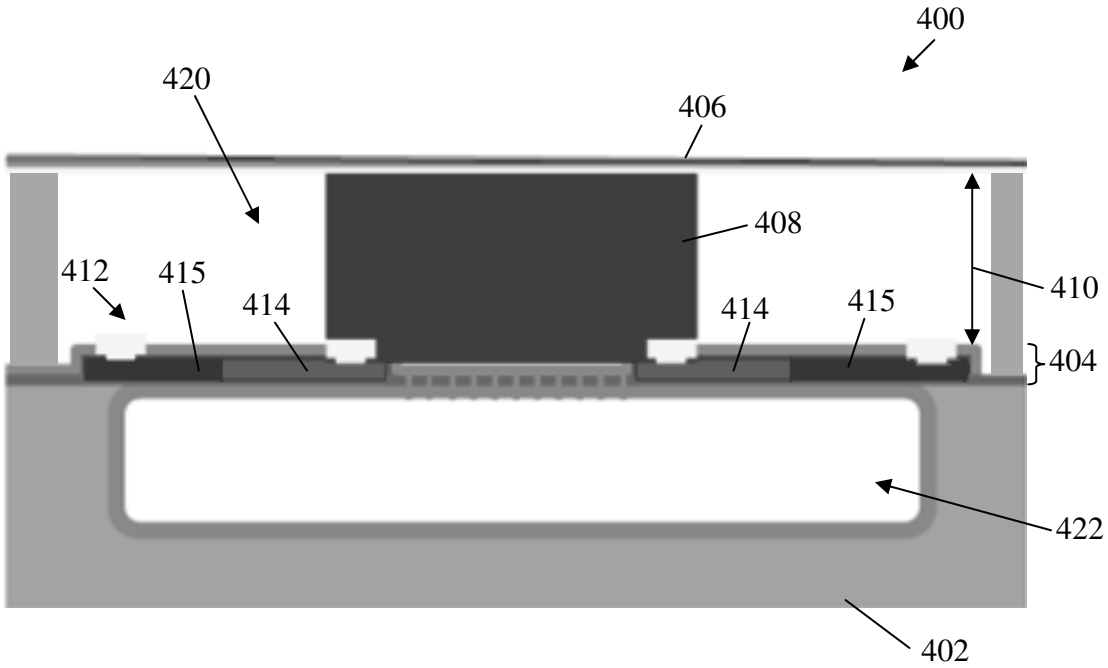

400
420
406
408
410
412
415
414
414
415
404
422
402

FIG. 4c

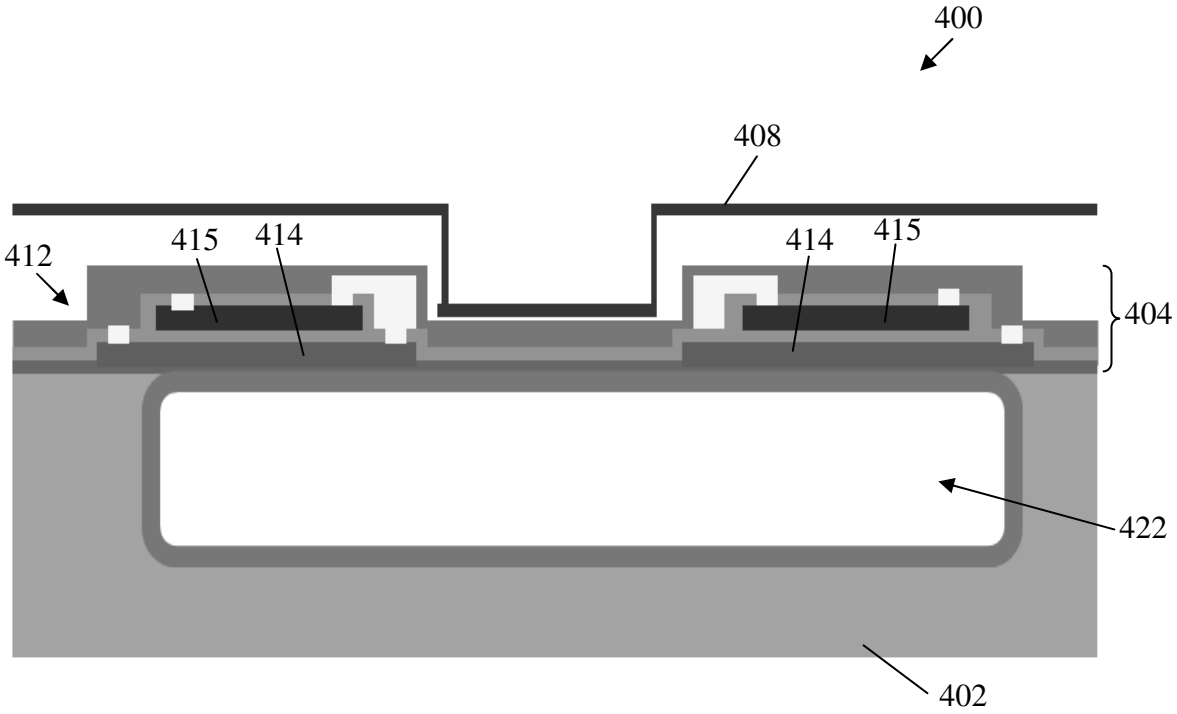


FIG. 5

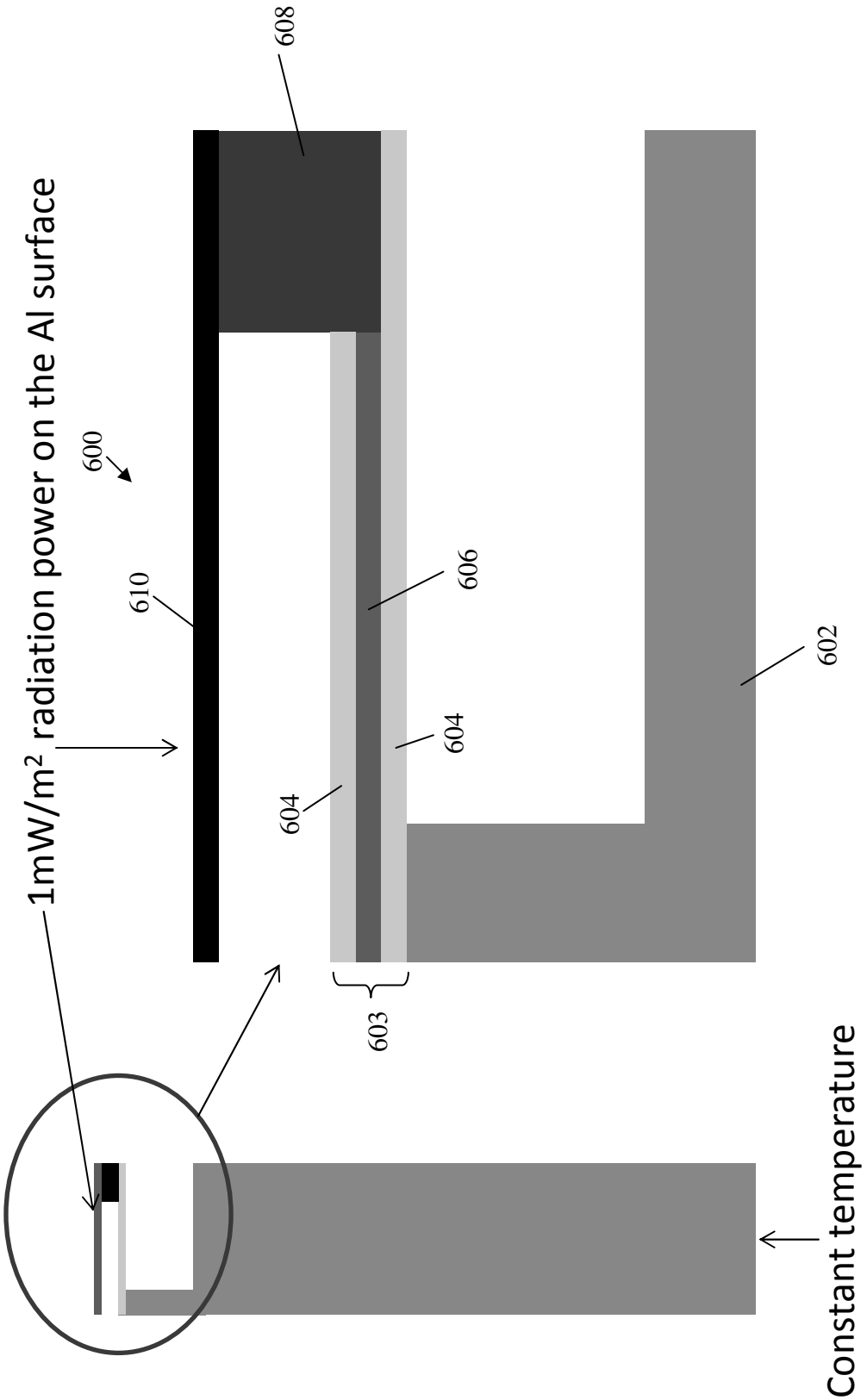

608
600
610
606
602
604
604
603
1mW/m² radiation power on the Al surface
Constant temperature

FIG. 6

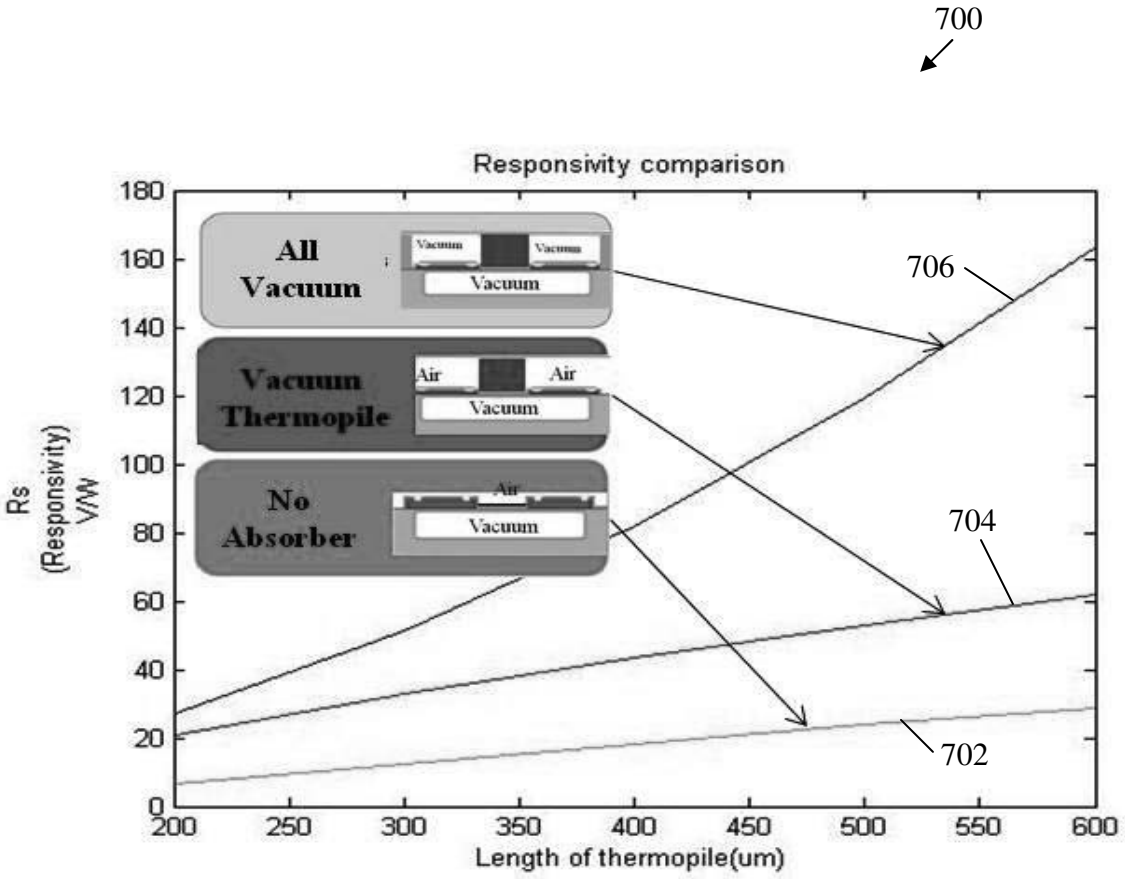

700
Responsivity comparison
All Vacuum
Vacuum
Vacuum
Vacuum
Vacuum Thermopile
Air
Air
Vacuum
No Absorber
Air
Vacuum
706
704
702
Rs (Responsivity) V/W
180
160
140
120
100
80
60
40
20
0
200
250
300
350
400
450
500
550
600
Length of thermopile(um)

FIG. 7a

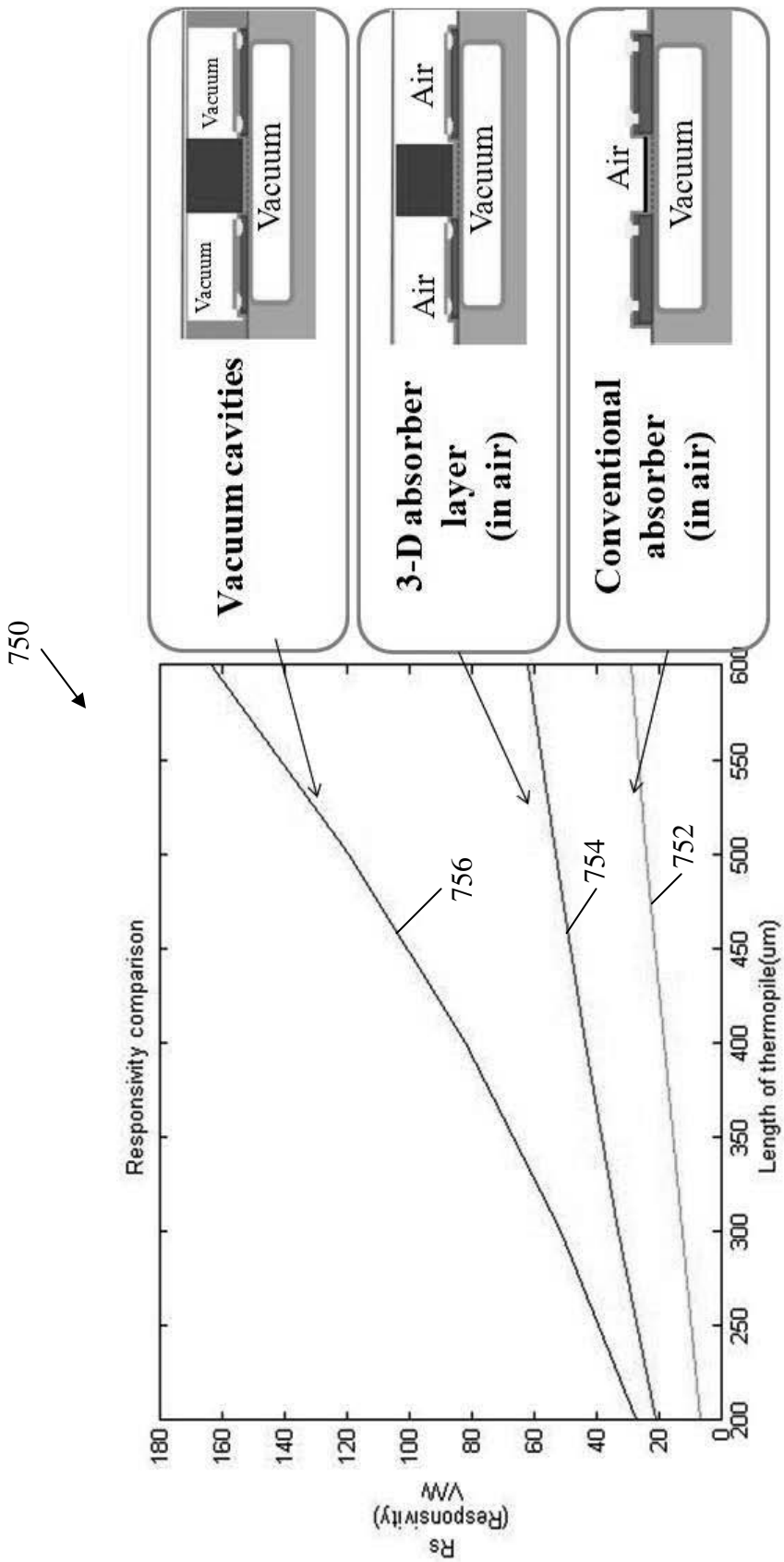

750
Vacuum cavities
Vacuum
Vacuum
Vacuum
3-D absorber layer (in air)
Air
Air
Vacuum
Conventional absorber (in air)
Air
Vacuum
Responsivity comparison
Rs (Responsivity) V/W
Length of thermopile(um)
180
160
140
120
100
80
60
40
20
0
200
250
300
350
400
450
500
550
600
756
754
752

FIG. 7b

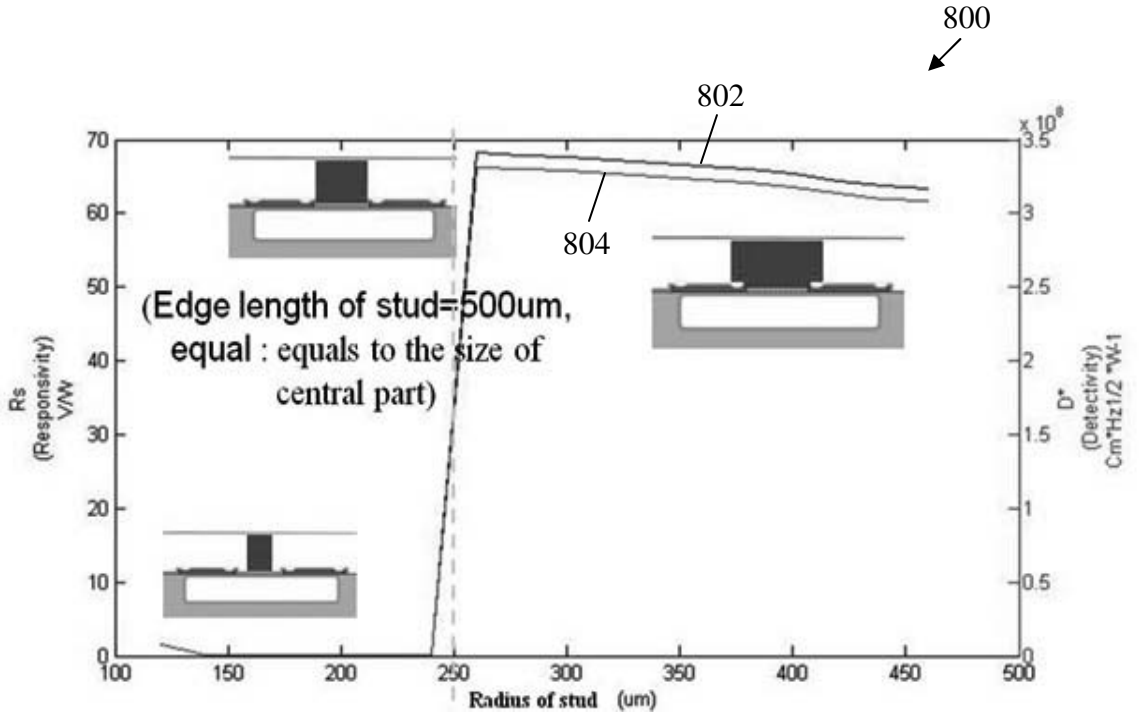

800
802
804
(Edge length of stud=500um,
equal : equals to the size of
central part)
Rs
(Responsivity)
V/W
D*
(Detectivity)
Cm*Hz1/2 *W-1
Radius of stud (um)

FIG. 8a

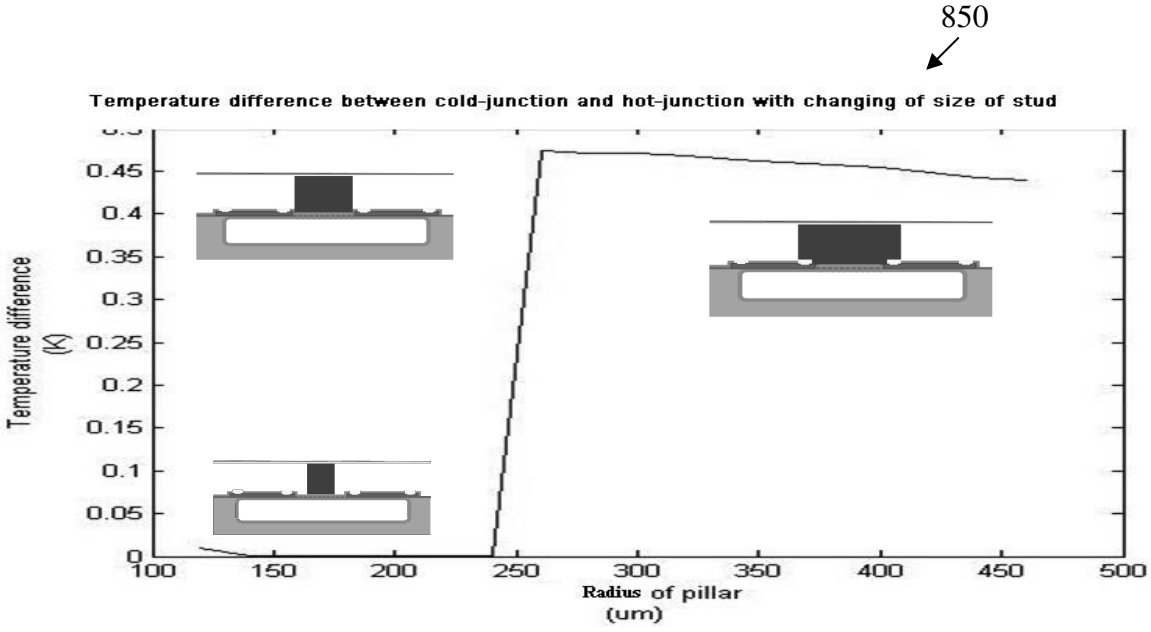

850
Temperature difference between cold-junction and hot-junction with changing of size of stud
Temperature difference
(K)
Radius of pillar
(um)

FIG. 8b

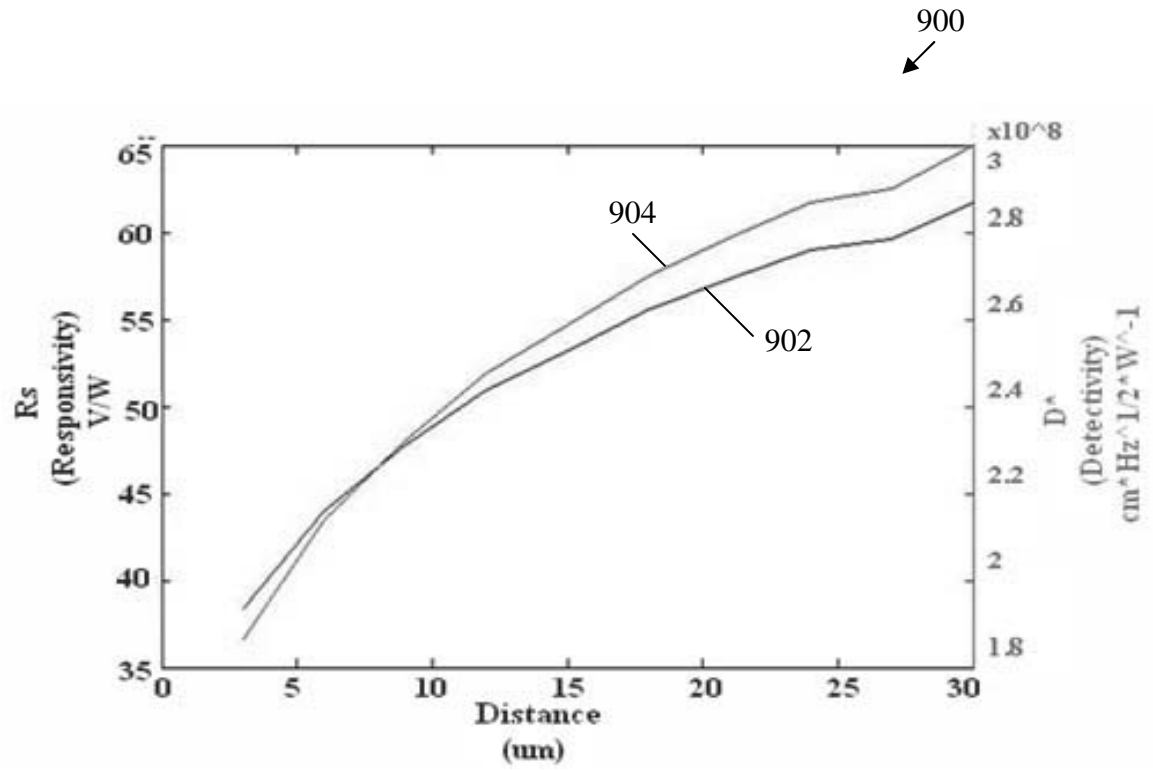

900
904
902
Rs
(Responsivity)
V/W
D*
(Detectivity)
cm*Hz^1/2*W^-1
x10^8
Distance
(um)

FIG. 9a

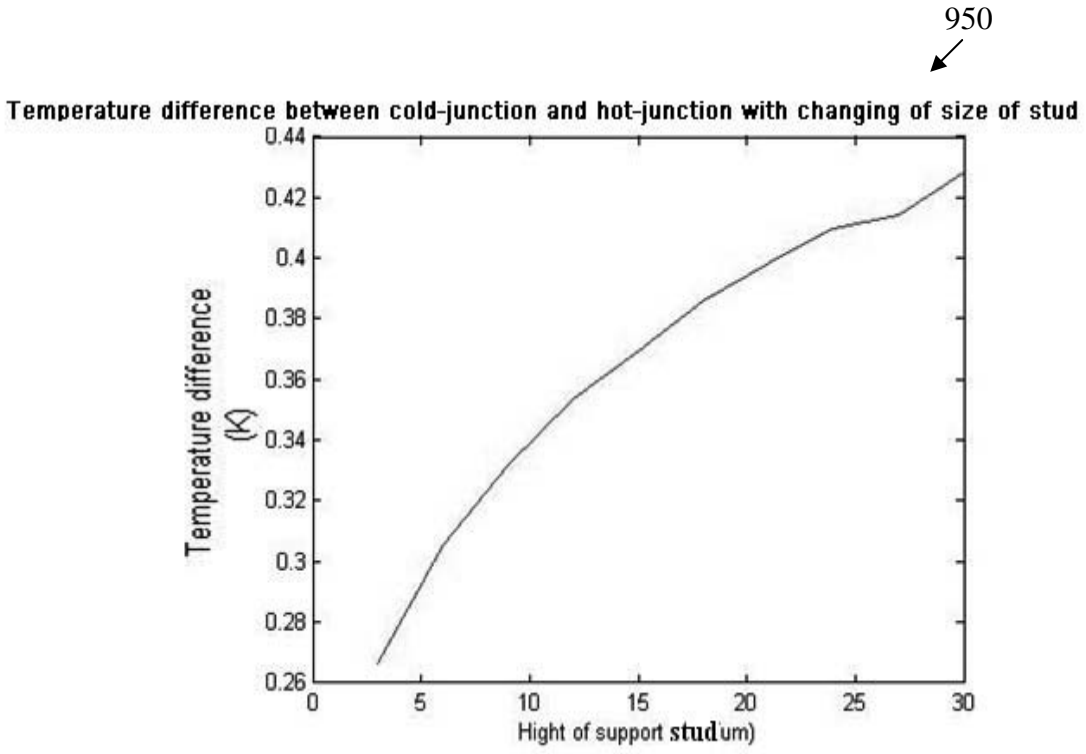

950
Temperature difference between cold-junction and hot-junction with changing of size of stud
Temperature difference
(K)
Hight of support studium)

FIG. 9b