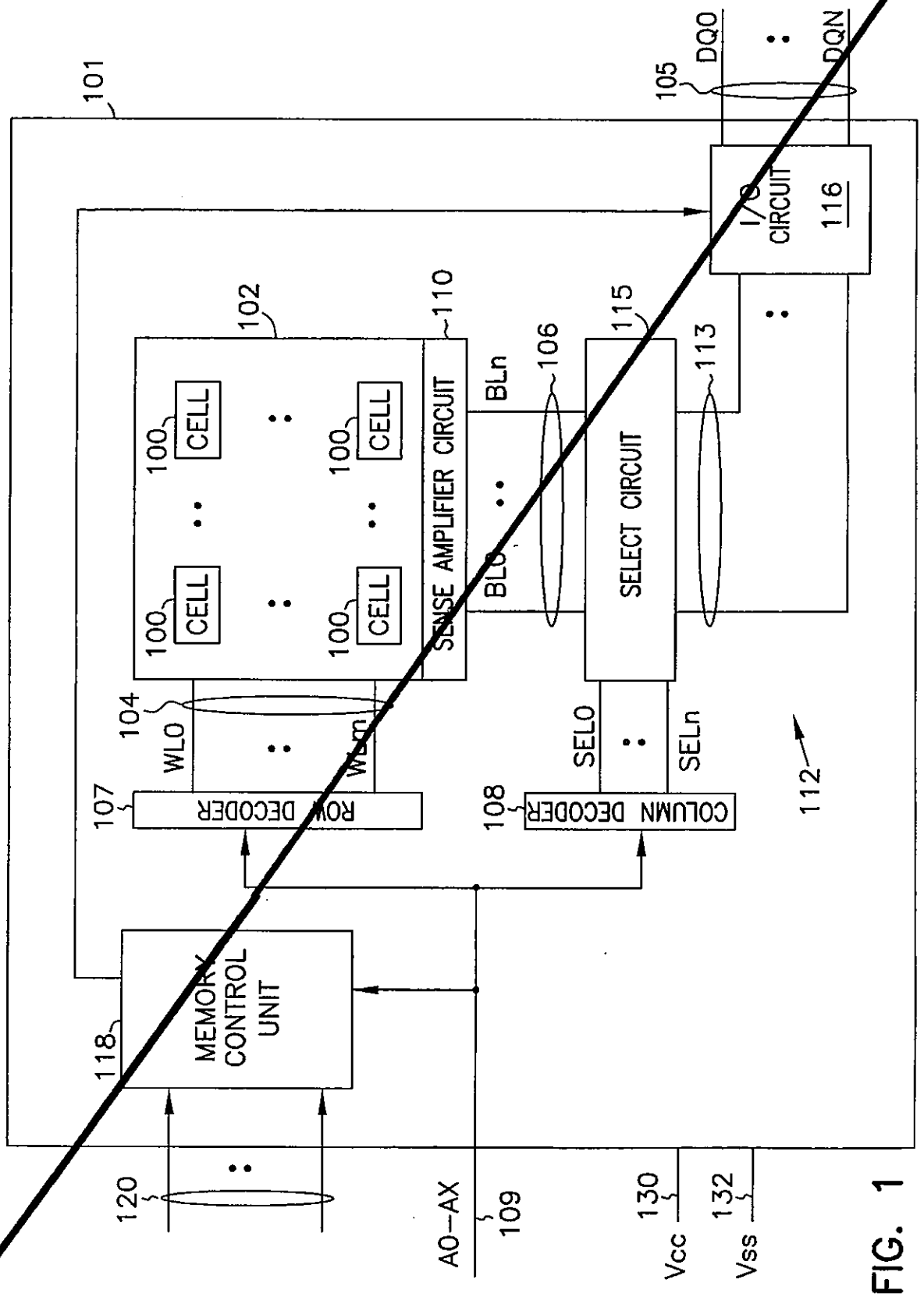
101
105
DQ0
DQN
I/O CIRCUIT
116
102
110
115
113
106
BLn
BL0
SENSE AMPLIFIER CIRCUIT
SELECT CIRCUIT
CELL
100
104
WL0
WLm
SEL0
SELn
107
ROW DECODER
108
COLUMN DECODER
112
MEMORY CONTROL UNIT
118
120
A0–AX
109
130
Vcc
132
Vss

FIG. 1

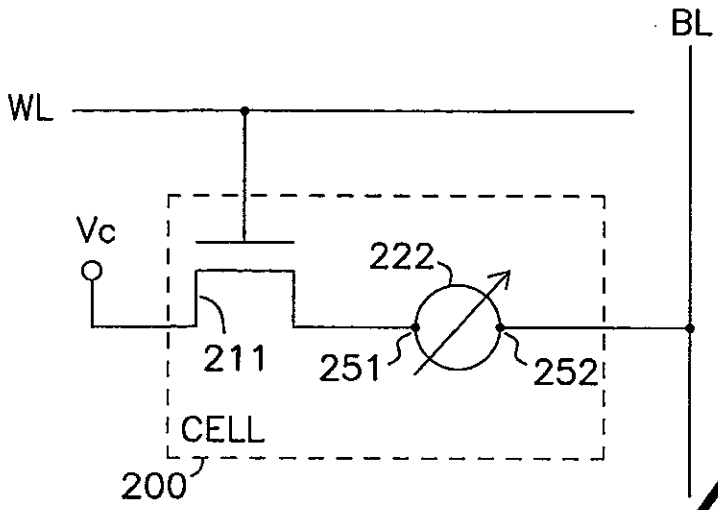

FIG. 2

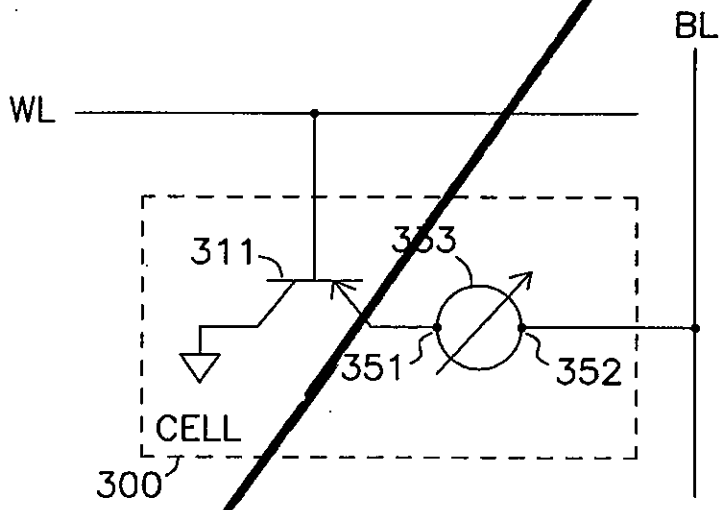

FIG. 3

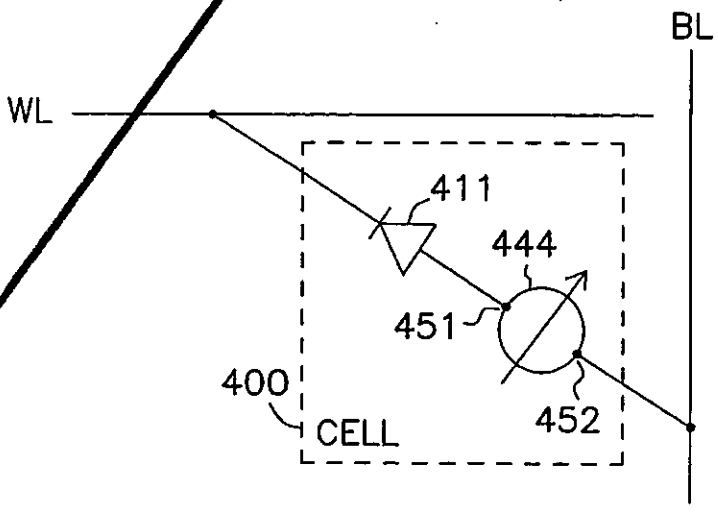

FIG. 4

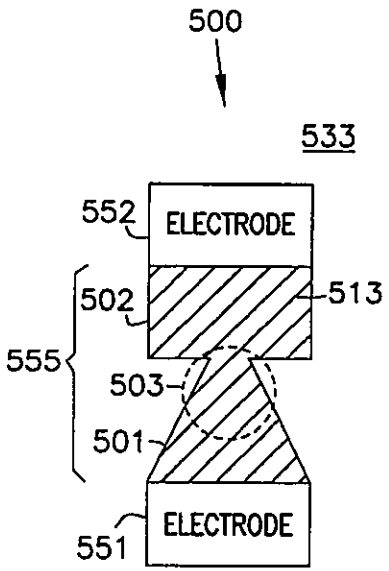

FIG. 5

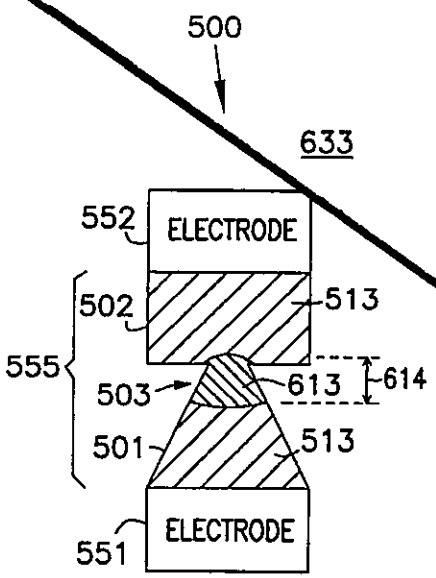

FIG. 6

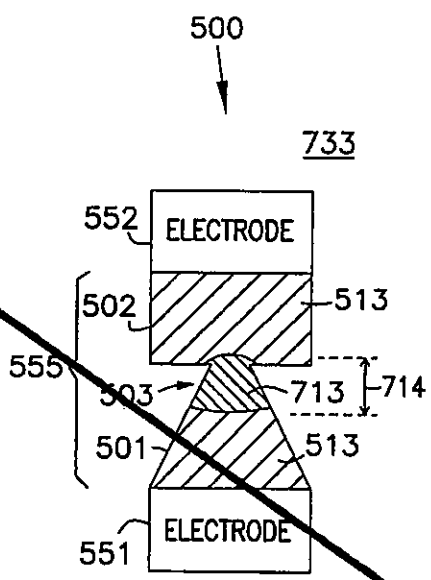

FIG. 7

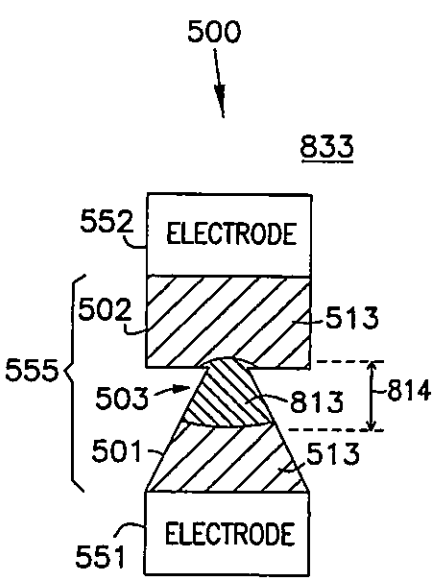

FIG. 8

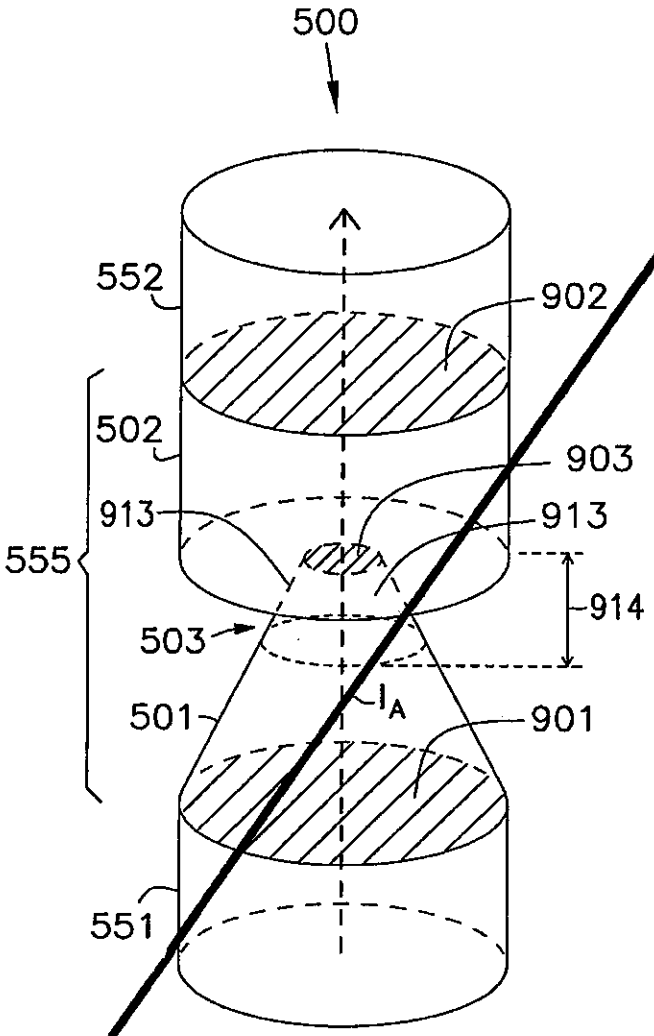

FIG. 9

TEMPERATURE
1001
CRYSTALLINE
AMORPHOUS
Tm
Tc
T0
T1
T2
T3
TIME

FIG. 10

TEMPERATURE
1101
AMORPHOUS
CRYSTALLINE
Tm
Tc
T4
T5
T6
T7
TIME

FIG. 11

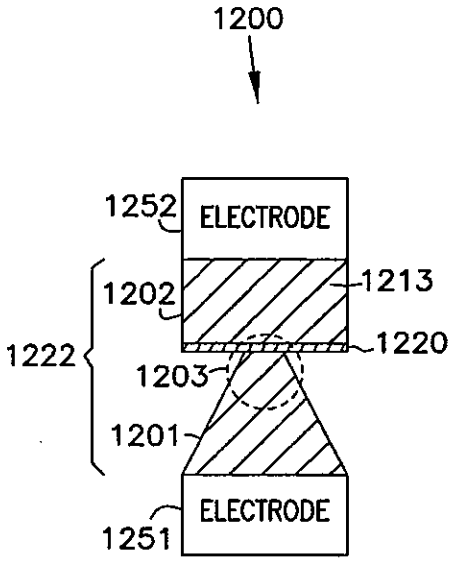
1200
1252
ELECTRODE
1202
1213
1222
1220
1203
1201
1251
ELECTRODE

FIG. 12

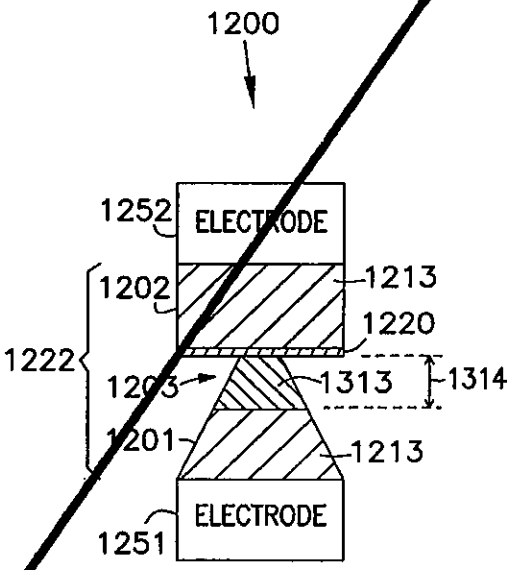
1200
1252
ELECTRODE
1202
1213
1220
1222
1313
1314
1203
1201
1213
1251
ELECTRODE

FIG. 13

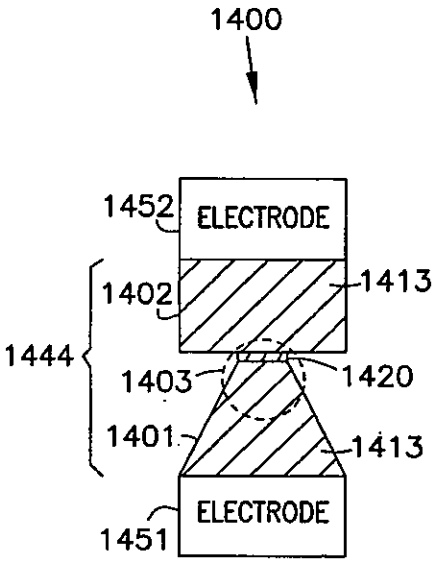
1400
1452
ELECTRODE
1402
1413
1444
1403
1420
1401
1413
ELECTRODE
1451

FIG. 14

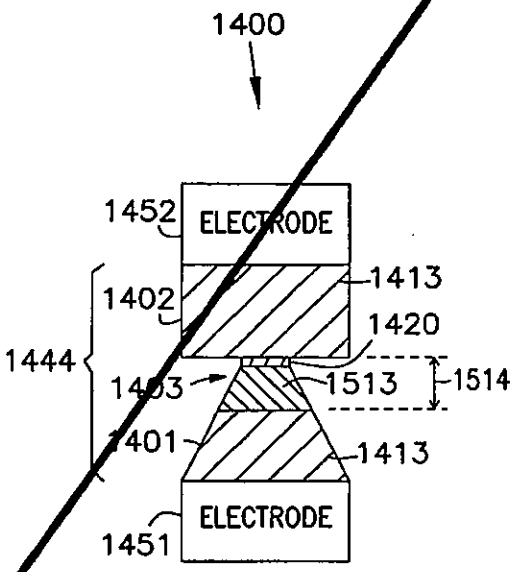
1400
1452
ELECTRODE
1413
1402
1420
1444
1403
1513
1514
1401
1413
ELECTRODE
1451

FIG. 15

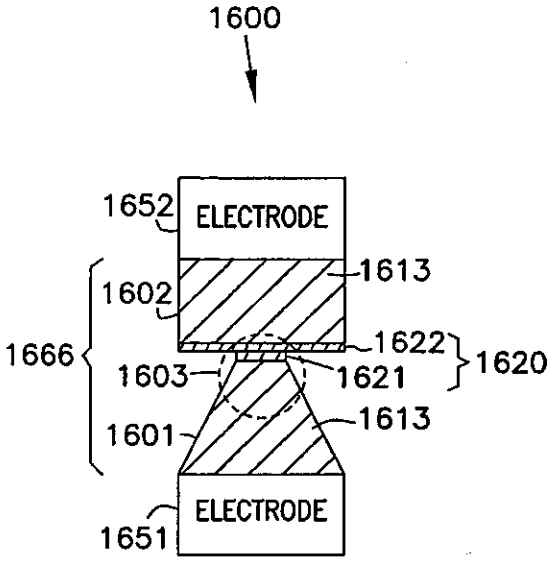
1600
1652
ELECTRODE
1613
1602
1622
1620
1666
1603
1621
1601
1613
ELECTRODE
1651

FIG. 16

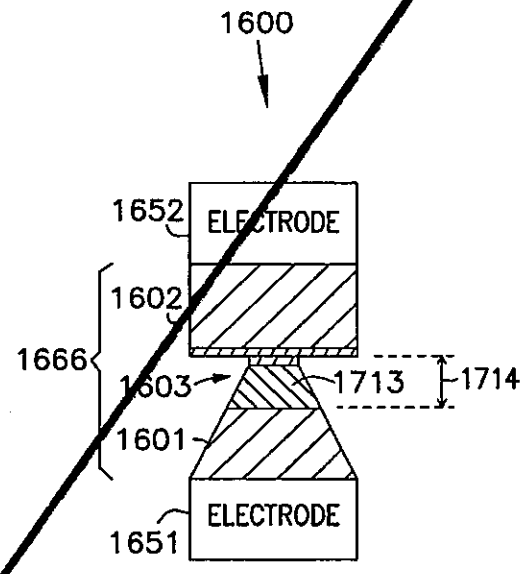
1600
1652
ELECTRODE
1602
1666
1603
1713
1714
1601
ELECTRODE
1651

FIG. 17

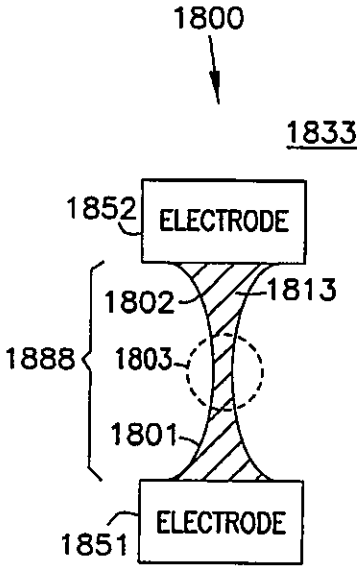

FIG. 18

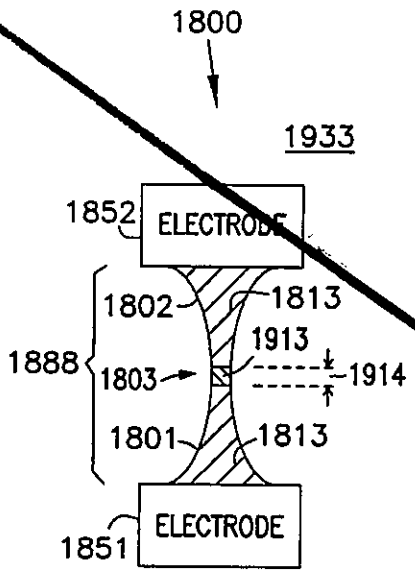

FIG. 19

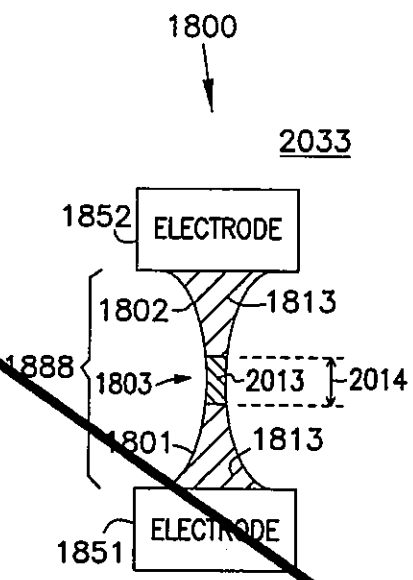

FIG. 20

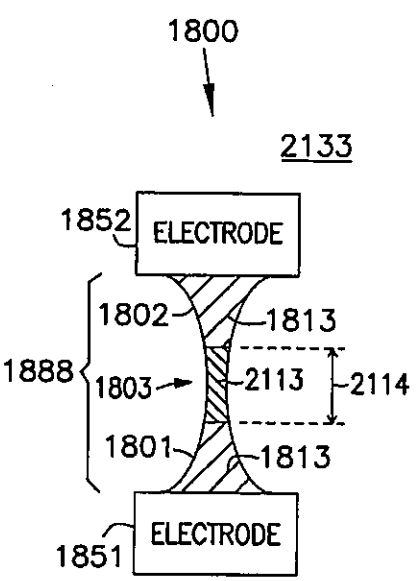

FIG. 21

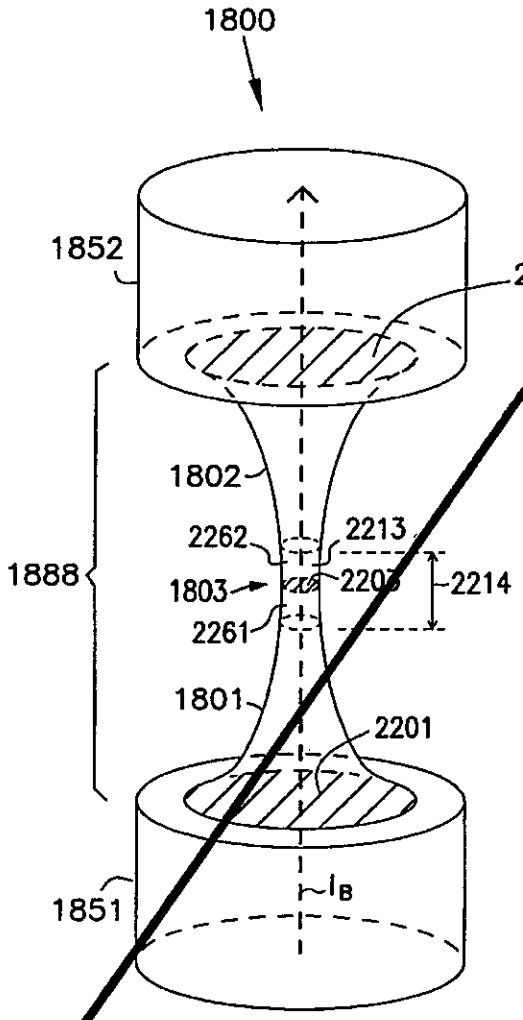
1800
1852
2202
1802
2262
2213
1888
1803
2203
2214
2261
1801
2201
1851
I_B

FIG. 22

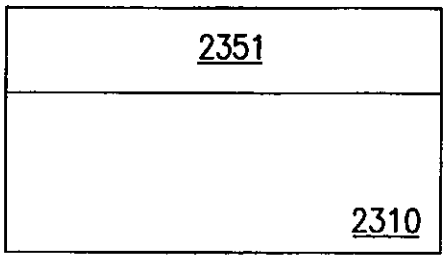

FIG. 23

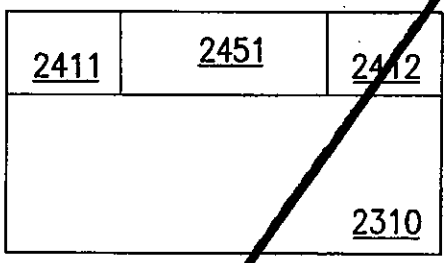

FIG. 24

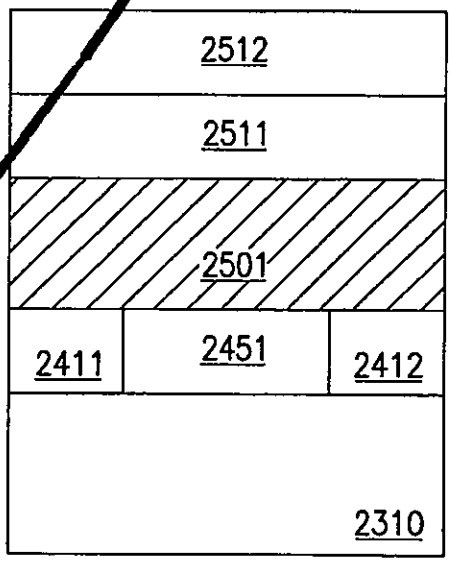

FIG. 25

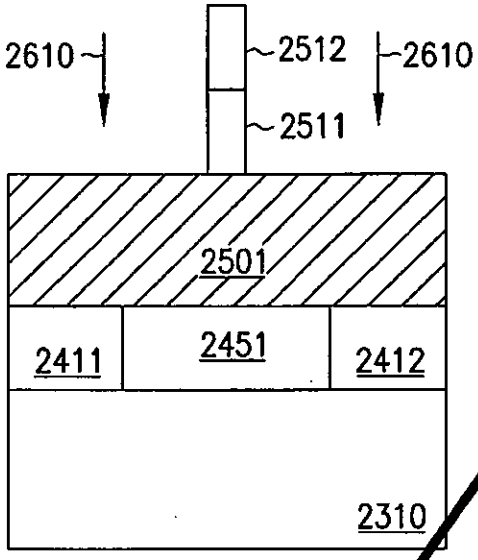

FIG. 26

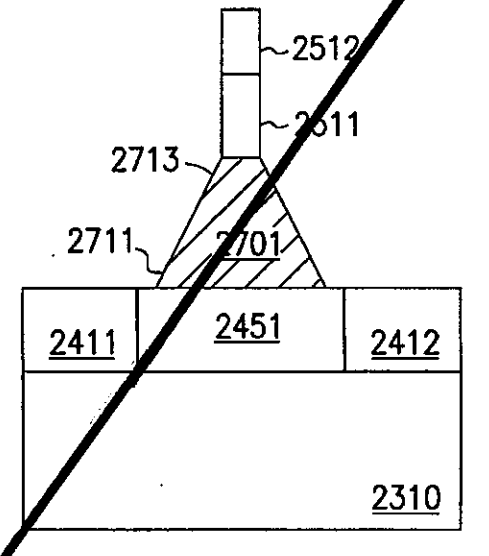

FIG. 27

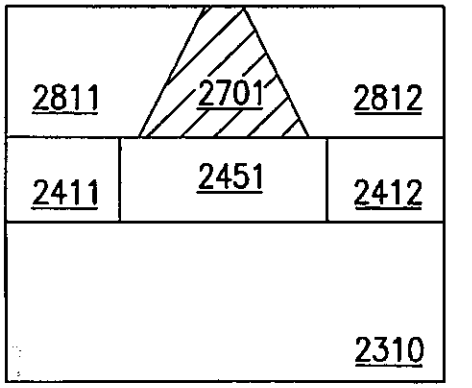

FIG. 28

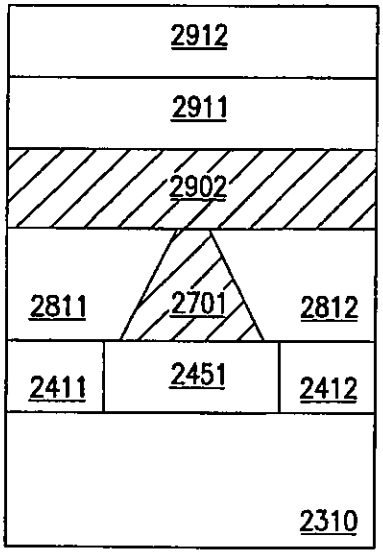

FIG. 29

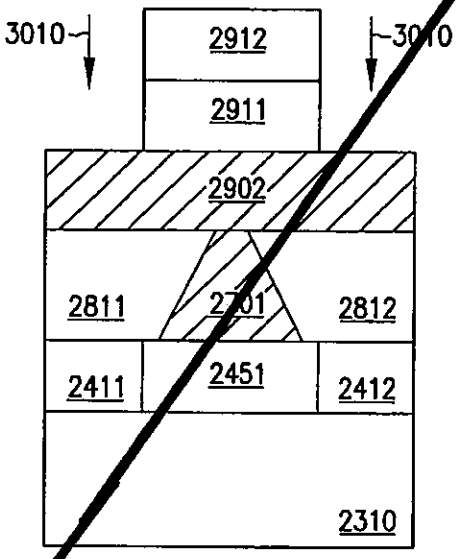

FIG. 30

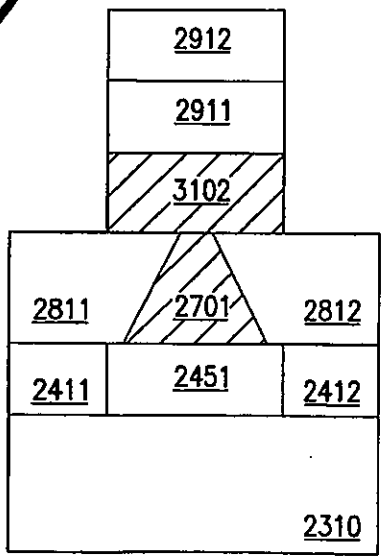

FIG. 31

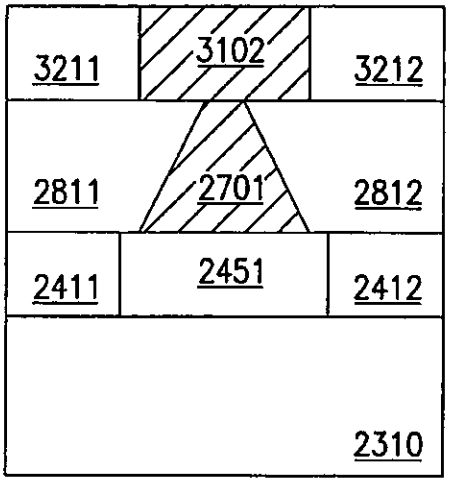

FIG. 32

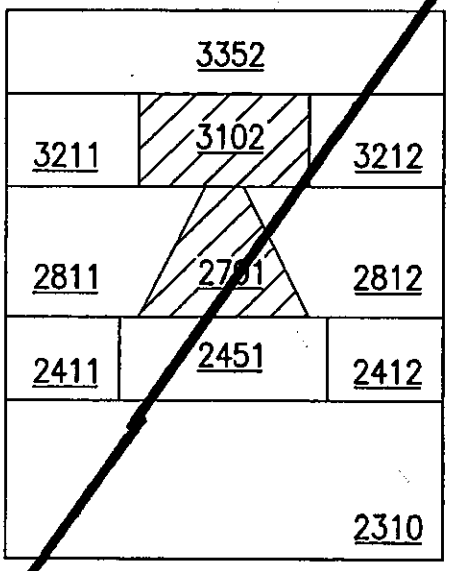

FIG. 33

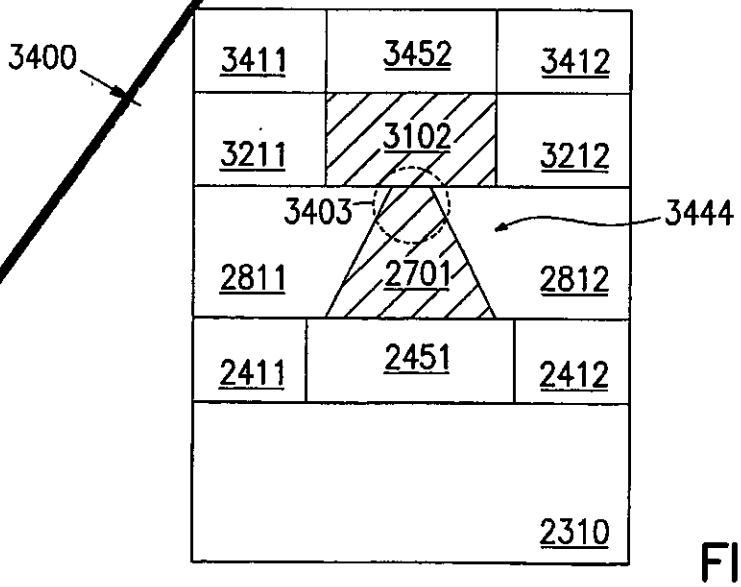

FIG. 34

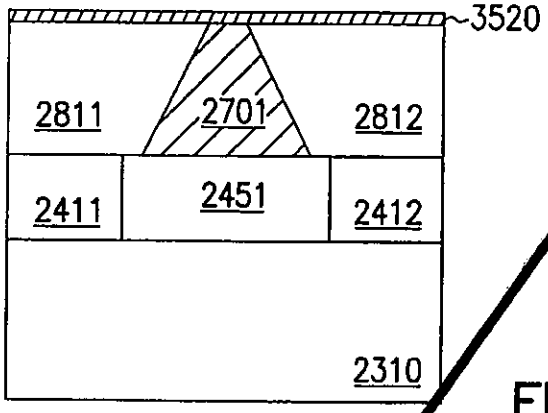
3520
2811
2701
2812
2411
2451
2412
2310

FIG. 35

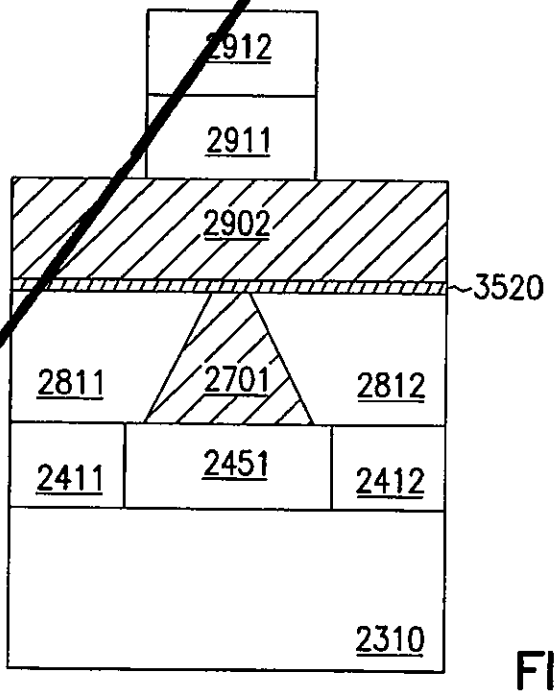
2912
2911
2902
3520
2811
2701
2812
2411
2451
2412
2310

FIG. 36

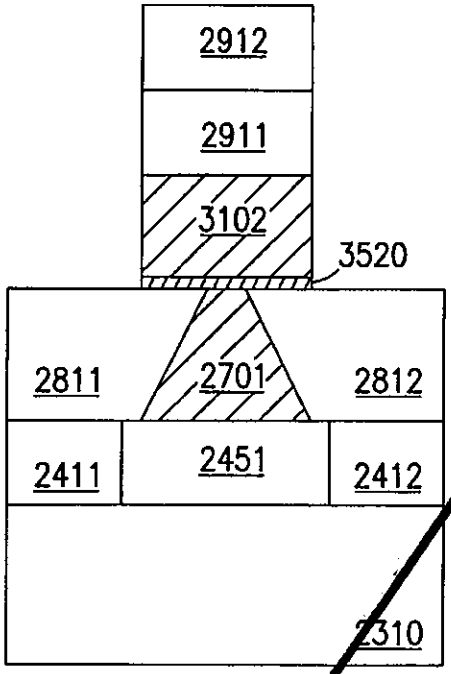
2912
2911
3102
3520
2811
2701
2812
2411
2451
2412
2310

FIG. 37

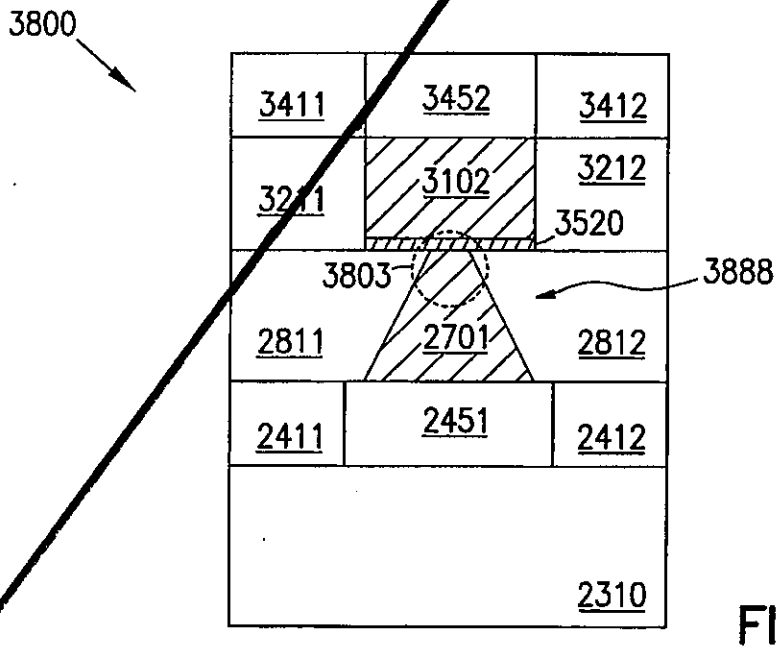
3800
3411
3452
3412
3212
3102
3520
3803
3888
2811
2701
2812
2411
2451
2412
2310

FIG. 38

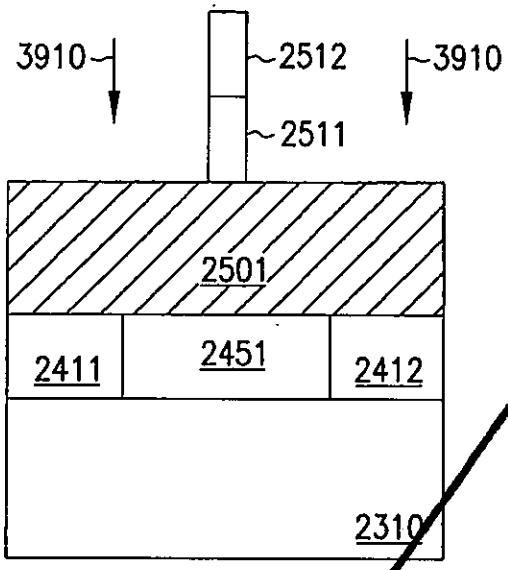
3910
2512
3910
2511
2501
2411
2451
2412
2310

FIG. 39

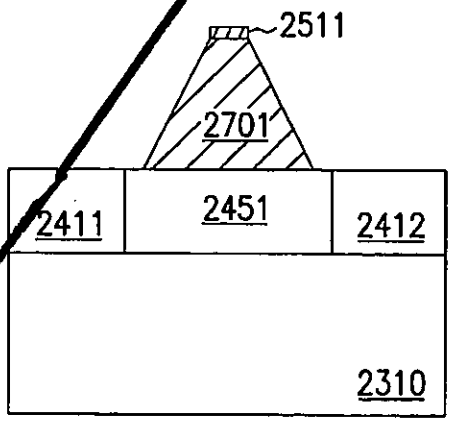
2511
2701
2411
2451
2412
2310

FIG. 40

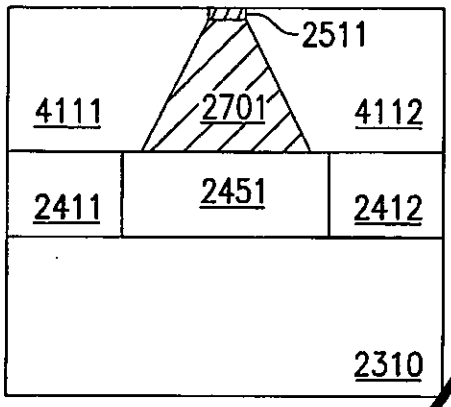
2511
4111
2701
4112
2411
2451
2412
2310

FIG. 41

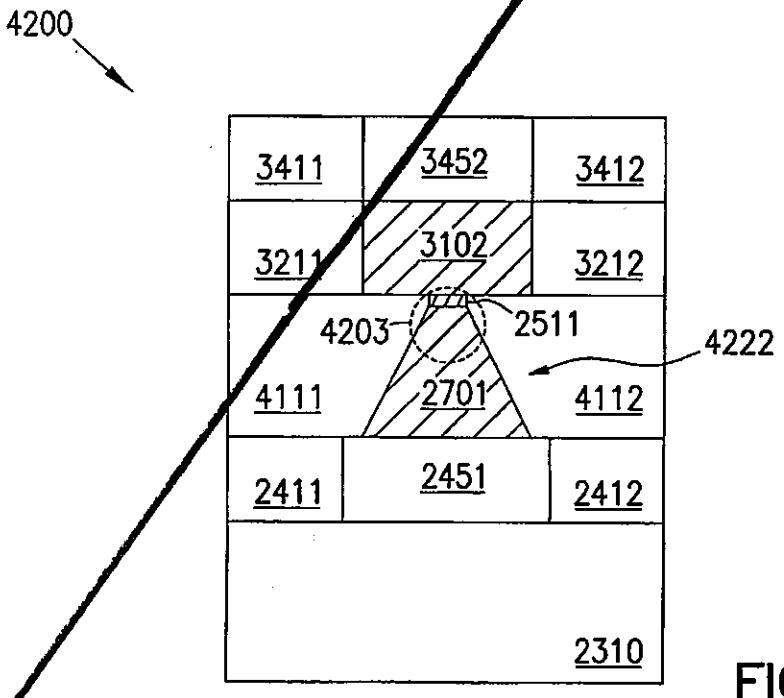
4200
3411
3452
3412
3211
3102
3212
4203
2511
4222
4111
2701
4112
2411
2451
2412
2310

FIG. 42

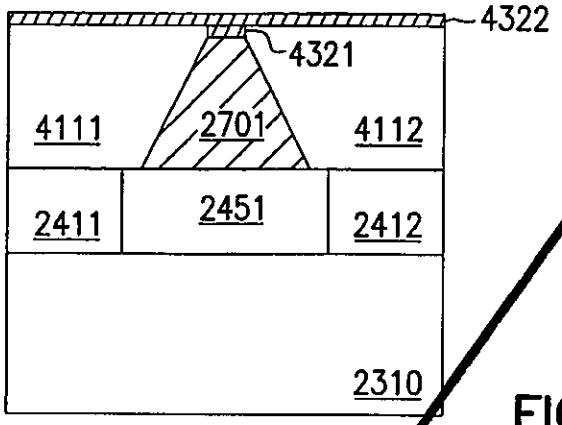
4322
4321
4111
2701
4112
2411
2451
2412
2310

FIG. 43

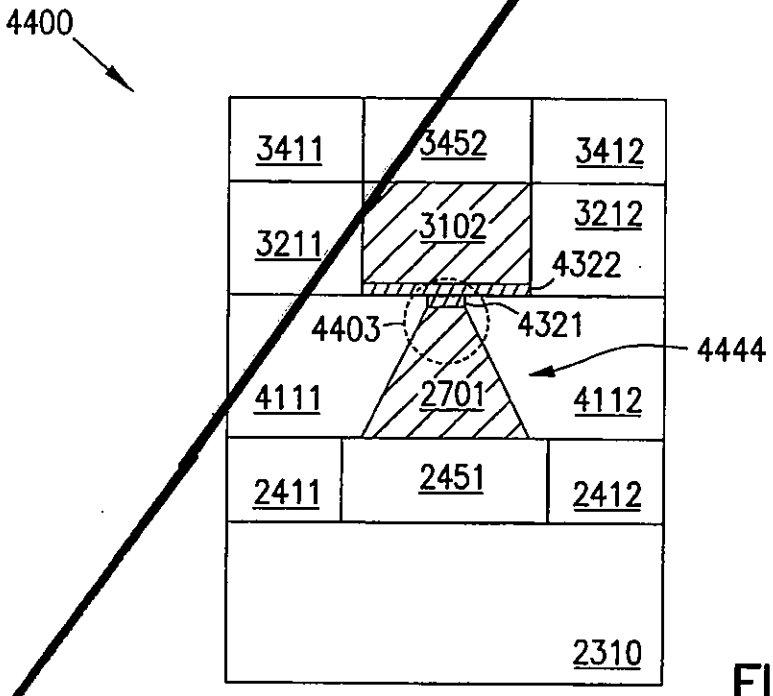
4400
3411
3452
3412
3211
3102
3212
4322
4403
4321
4444
4111
2701
4112
2411
2451
2412
2310

FIG. 44

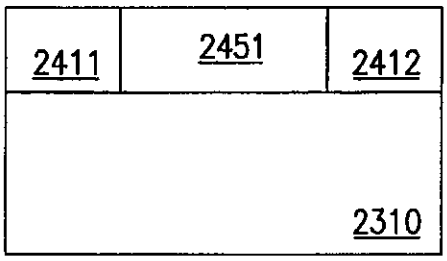

FIG. 45

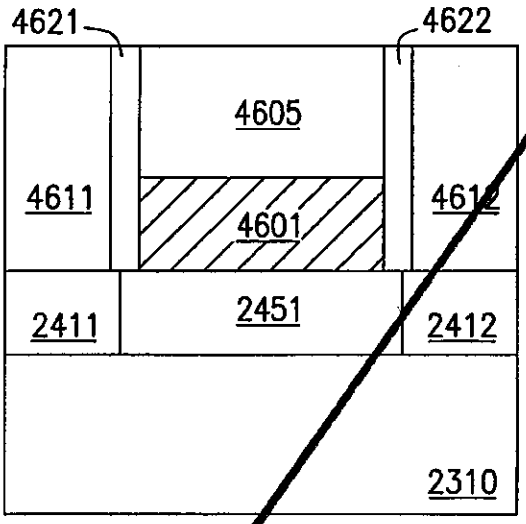

FIG. 46

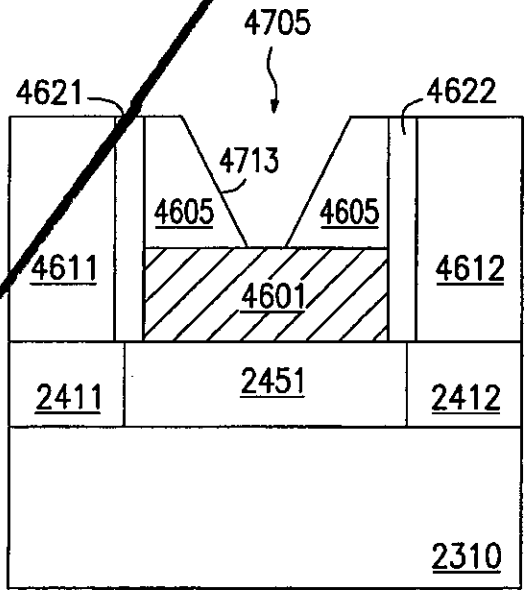

FIG. 47

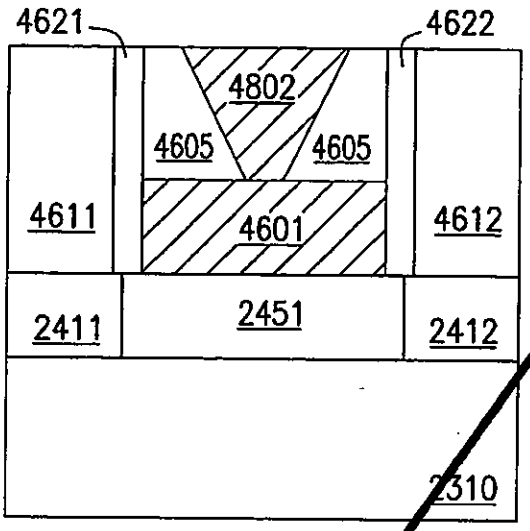
4621
4622
4802
4605
4605
4611
4601
4612
2411
2451
2412
2310

FIG. 48

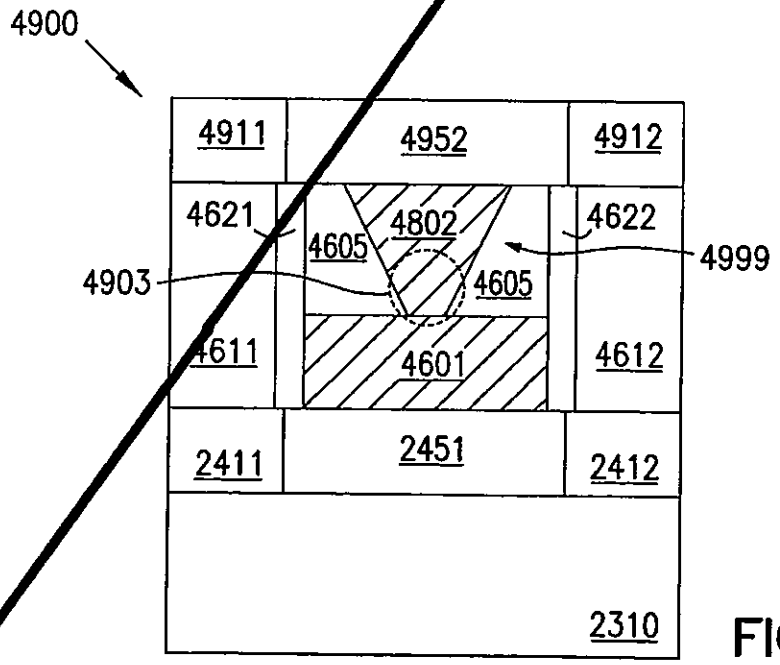
4900
4911
4952
4912
4621
4802
4622
4605
4999
4903
4605
4611
4601
4612
2411
2451
2412
2310

FIG. 49

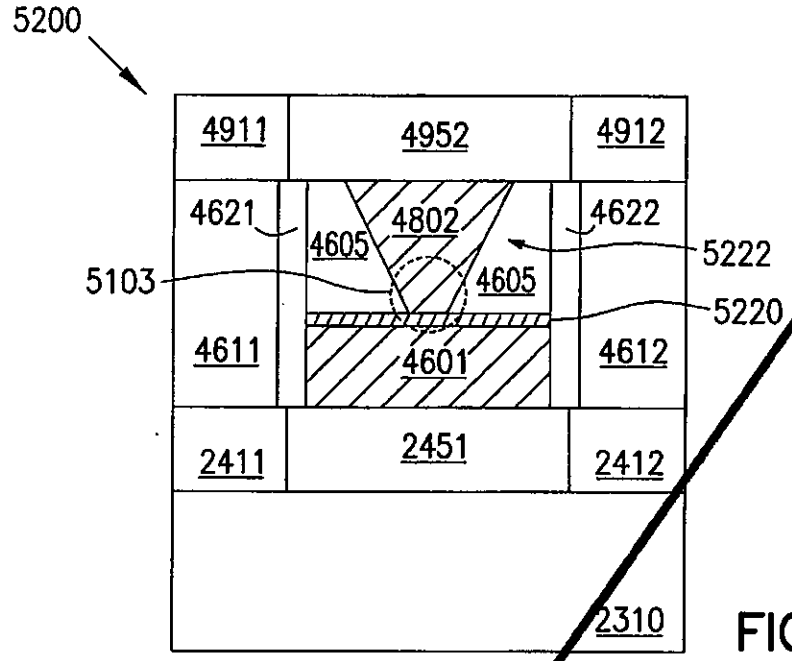
5200
4911
4952
4912
4621
4802
4622
4605
5222
5103
4605
5220
4611
4601
4612
2411
2451
2412
2310

FIG. 52

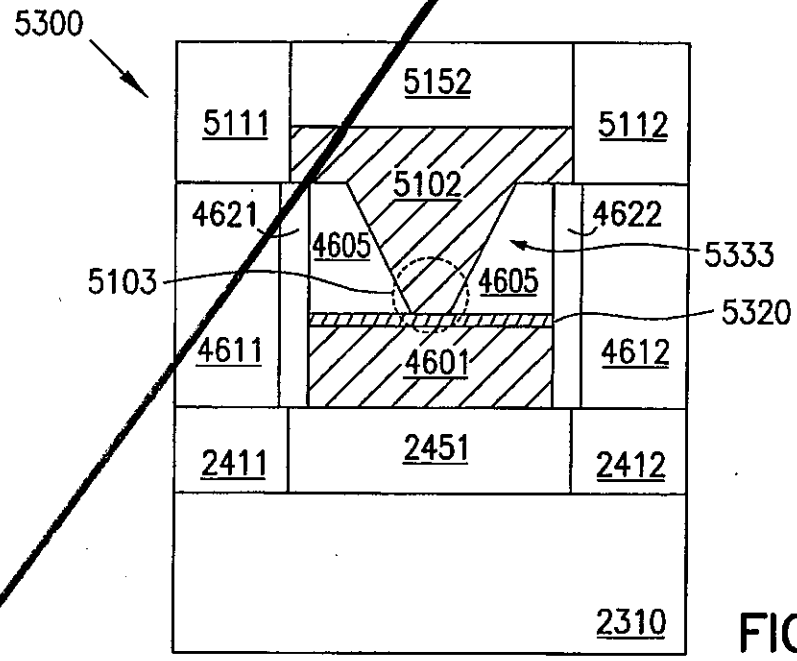
5300
5152
5111
5112
5102
4621
4622
4605
5333
5103
4605
5320
4611
4601
4612
2411
2451
2412
2310

FIG. 53

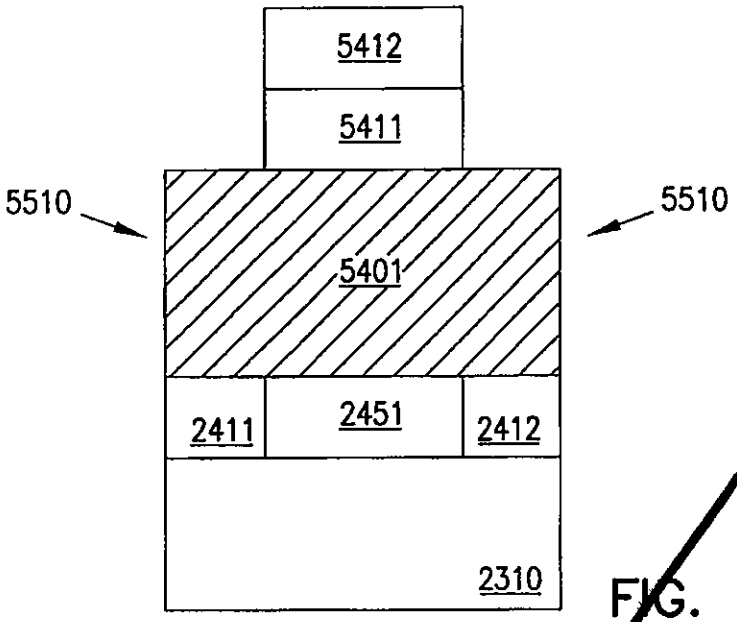

FIG. 54

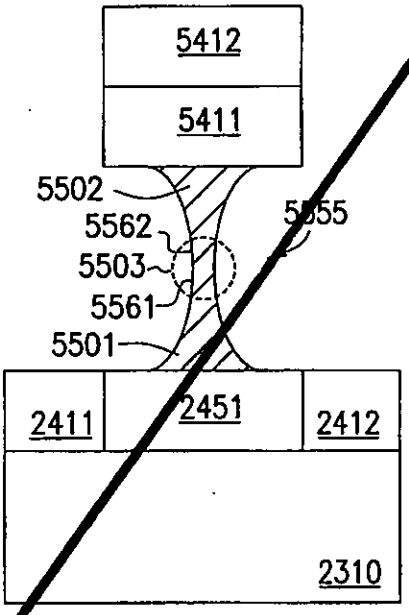

FIG. 55

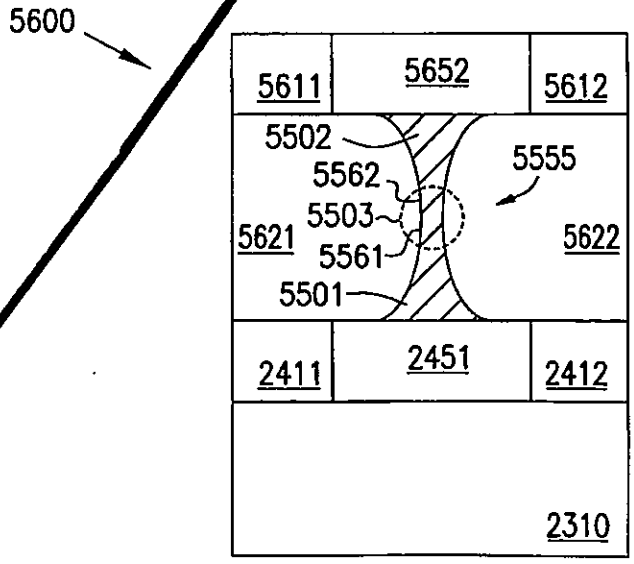

FIG. 56

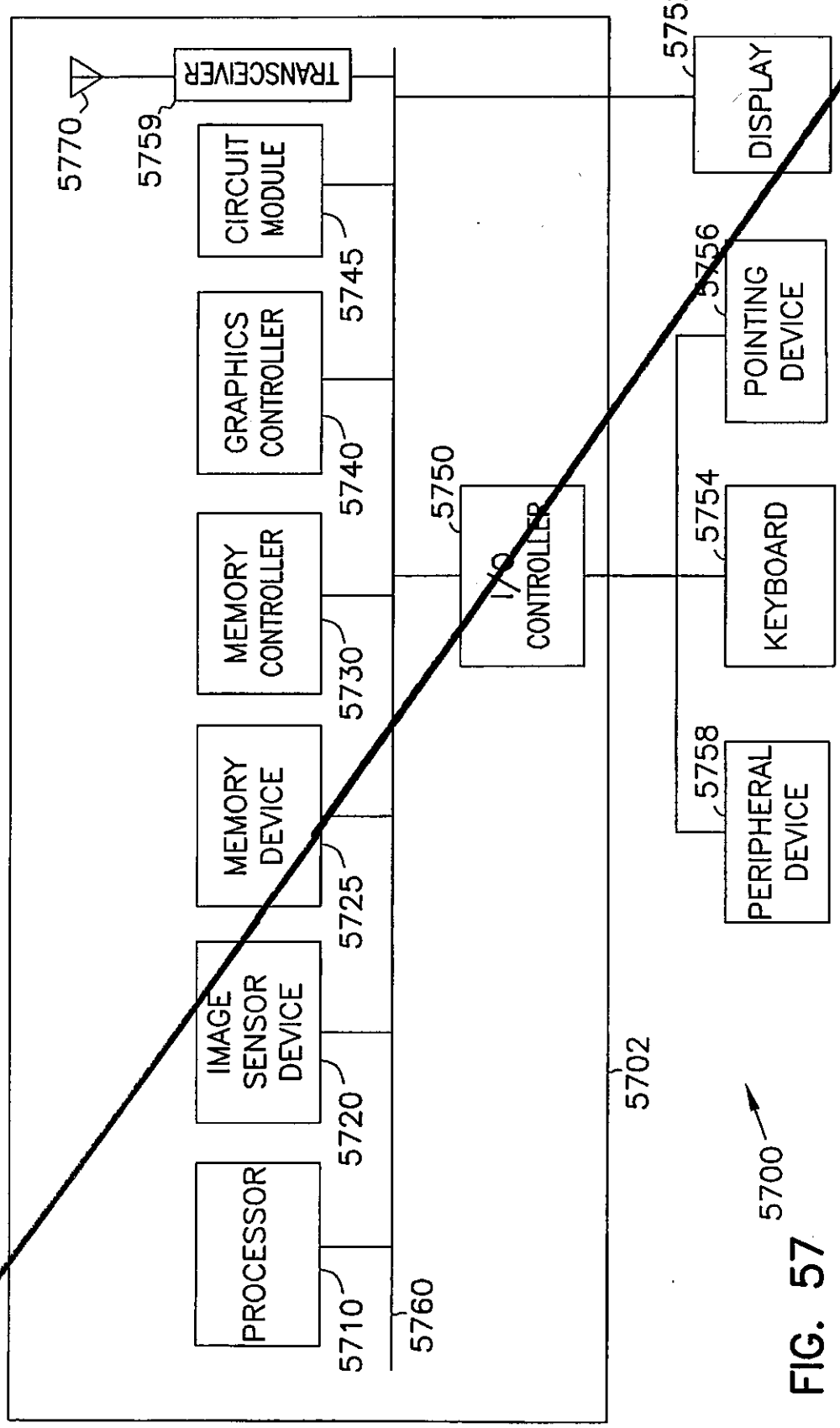
5700
5702
PROCESSOR
5710
IMAGE SENSOR DEVICE
5720
MEMORY DEVICE
5725
MEMORY CONTROLLER
5730
GRAPHICS CONTROLLER
5740
CIRCUIT MODULE
5745
TRANSCEIVER
5759
5770
5760
I/O CONTROLLER
5750
DISPLAY
5752
POINTING DEVICE
5756
KEYBOARD
5754
PERIPHERAL DEVICE
5758

FIG. 57

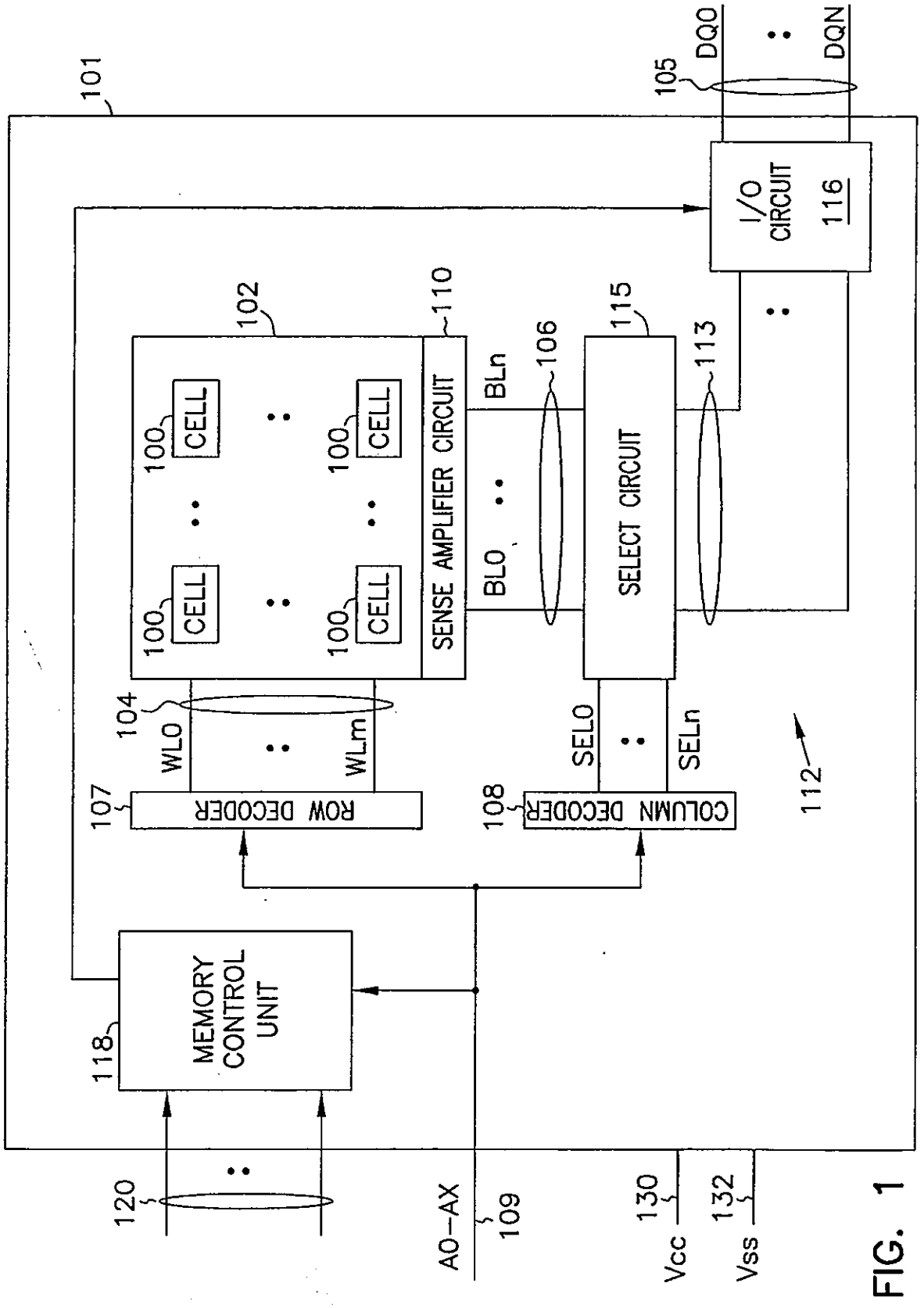
101
105
DQ0
DQN
I/O CIRCUIT
116
102
110
SENSE AMPLIFIER CIRCUIT
BLn
106
115
SELECT CIRCUIT
113
CELL
100
BL0
104
WL0
WLm
107
ROW DECODER
SEL0
SELn
108
COLUMN DECODER
112
MEMORY CONTROL UNIT
118
120
A0–AX
109
130
Vcc
132
Vss

FIG. 1

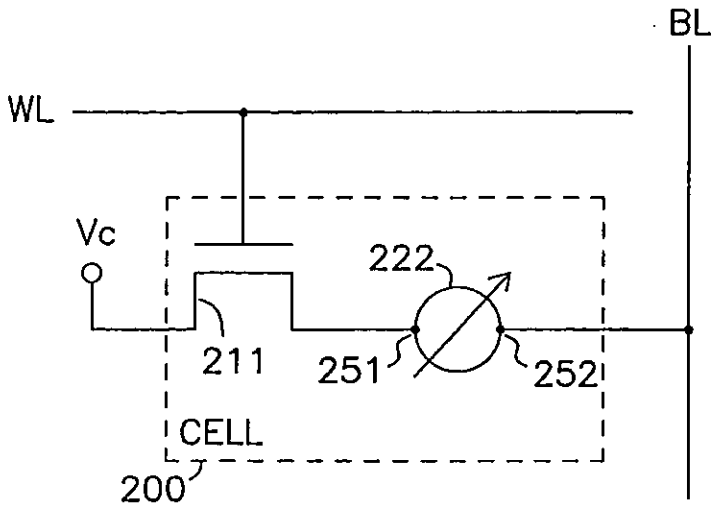

FIG. 2

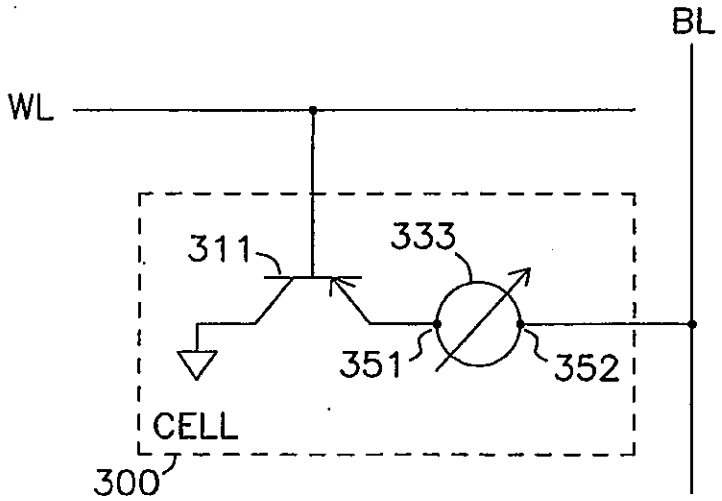

FIG. 3

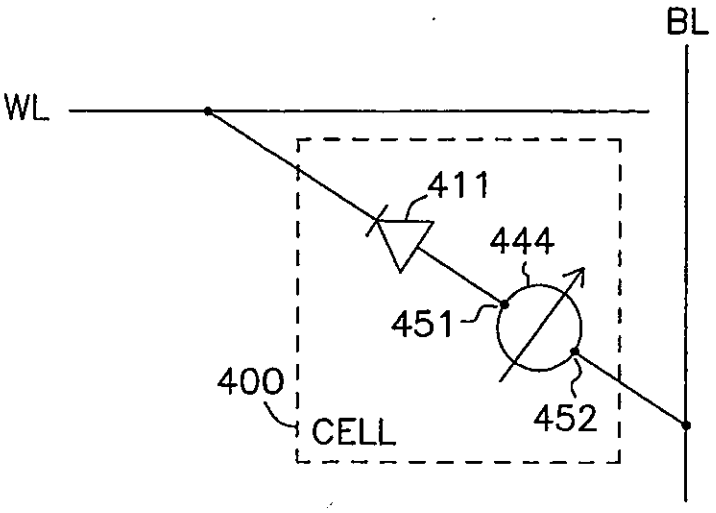

FIG. 4

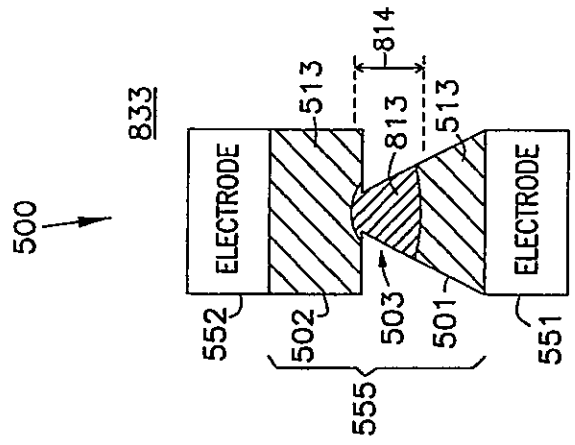

FIG. 8

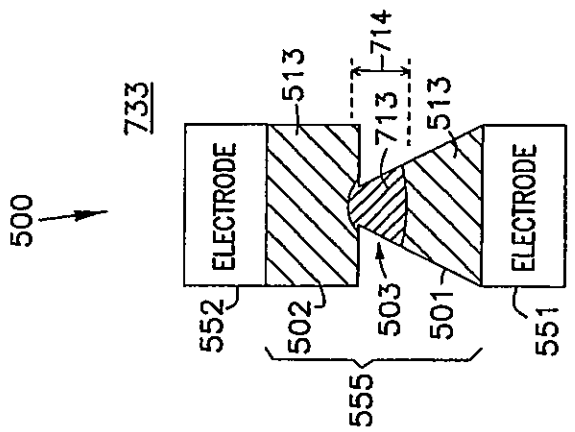

FIG. 7

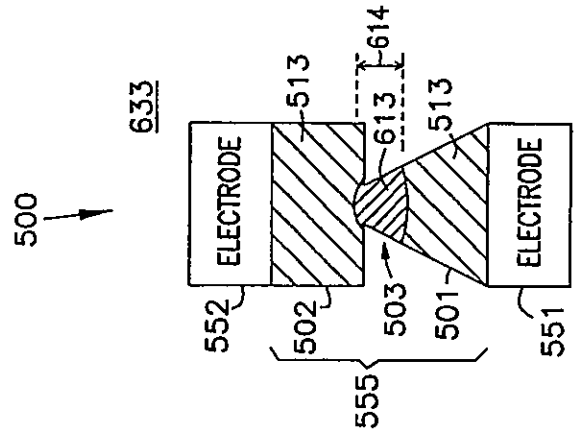

FIG. 6

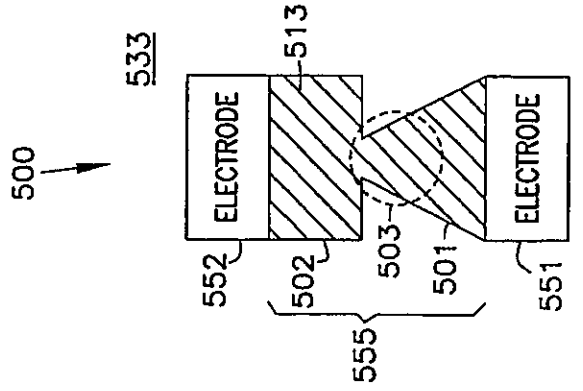

FIG. 5

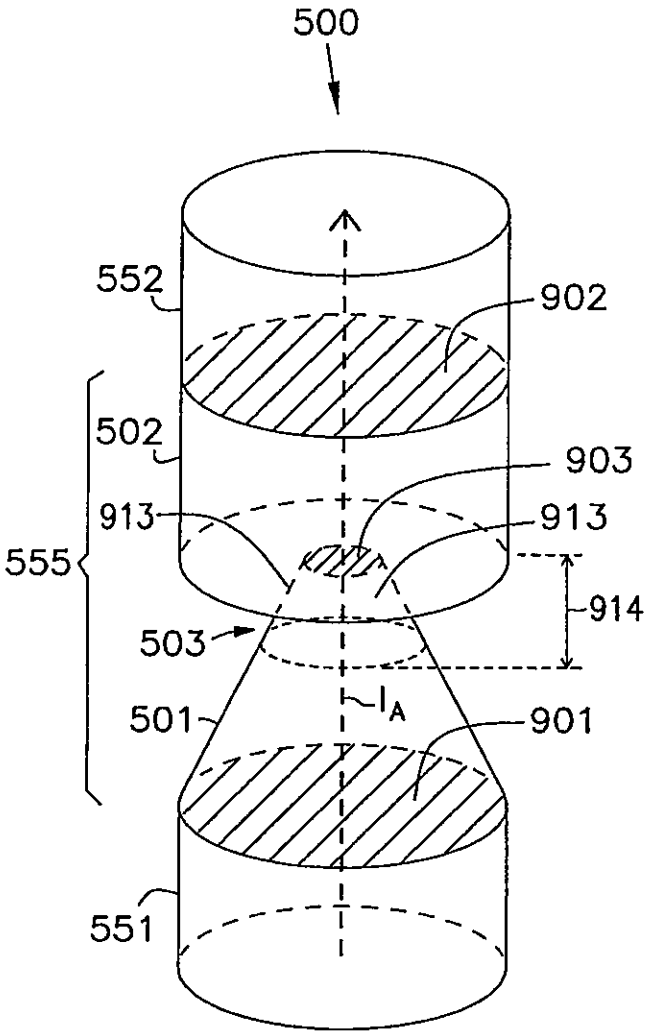

FIG. 9

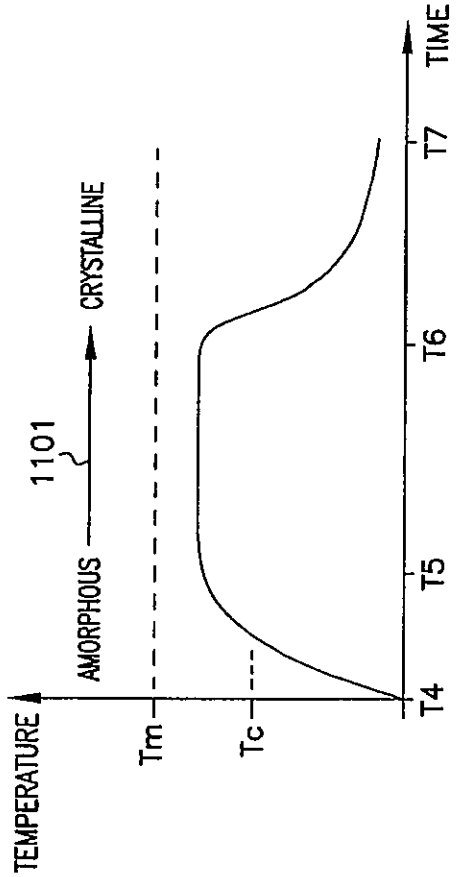
TEMPERATURE
AMORPHOUS
1101
CRYSTALLINE
Tm
Tc
T4
T5
T6
T7
TIME

FIG. 11

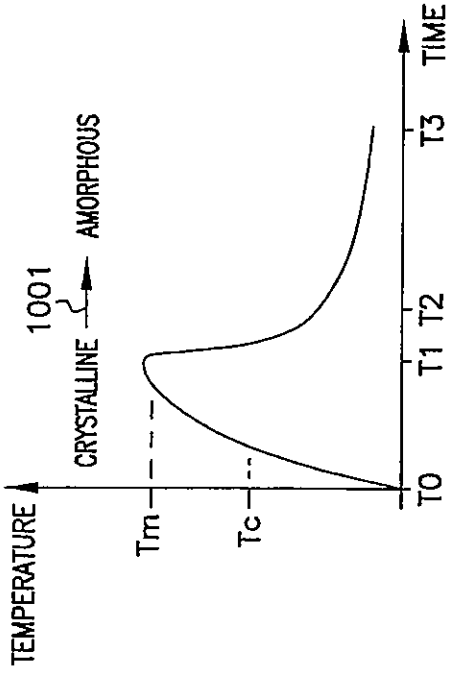
TEMPERATURE
CRYSTALLINE
1001
AMORPHOUS
Tm
Tc
T0
T1
T2
T3
TIME

FIG. 10

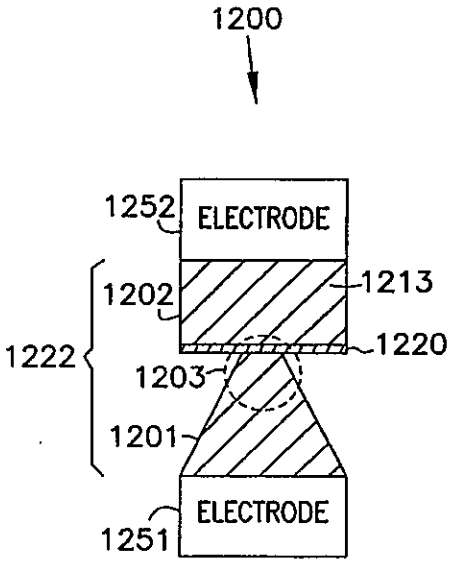
1200
1252
ELECTRODE
1202
1213
1222
1220
1203
1201
1251
ELECTRODE

FIG. 12

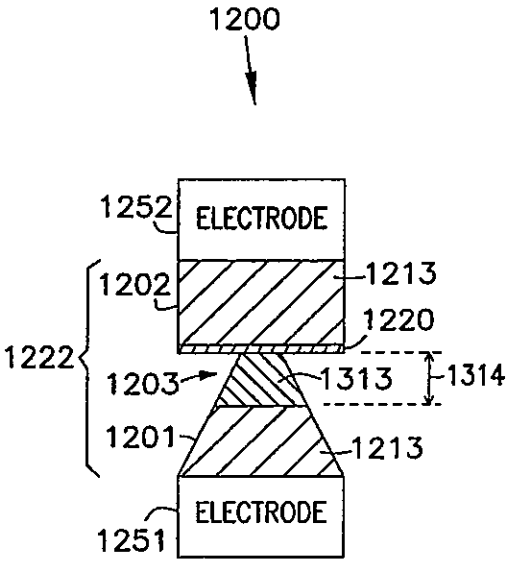
1200
1252
ELECTRODE
1202
1213
1220
1222
1203
1313
1314
1201
1213
1251
ELECTRODE

FIG. 13

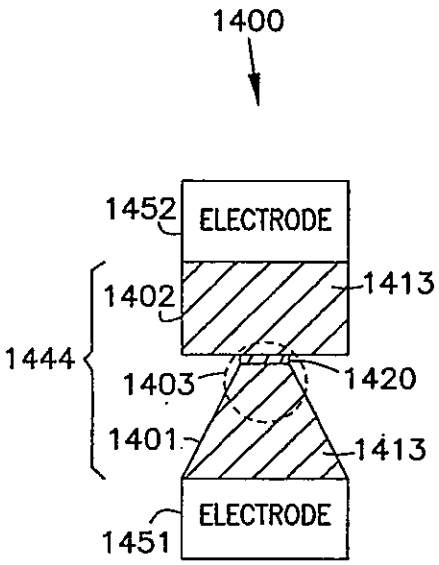
1400
1452
ELECTRODE
1402
1413
1444
1403
1420
1401
1413
ELECTRODE
1451

FIG. 14

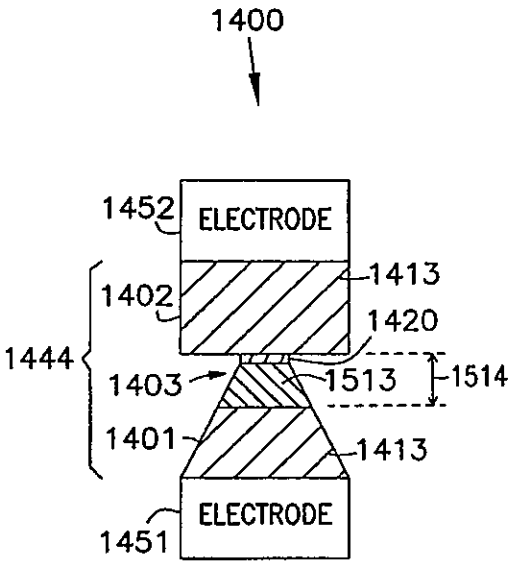
1400
1452
ELECTRODE
1413
1402
1420
1444
1403
1513
1514
1401
1413
ELECTRODE
1451

FIG. 15

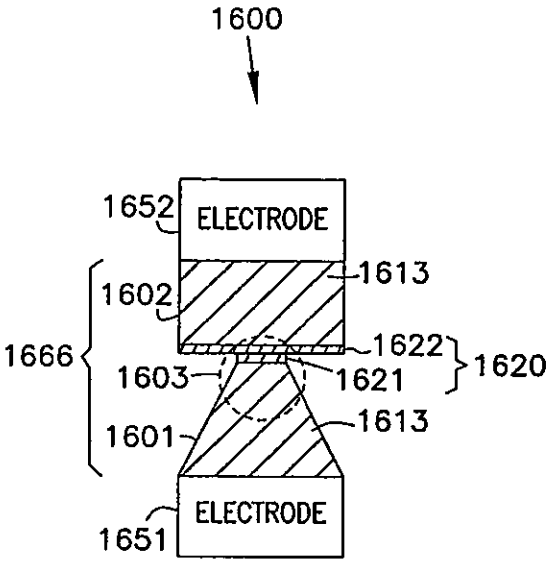
1600
1652
ELECTRODE
1613
1602
1622
1620
1666
1603
1621
1601
1613
ELECTRODE
1651

FIG. 16

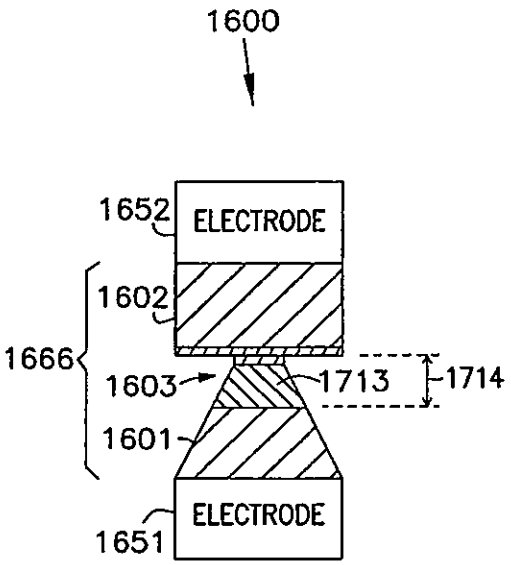
1600
1652
ELECTRODE
1602
1666
1603
1713
1714
1601
ELECTRODE
1651

FIG. 17

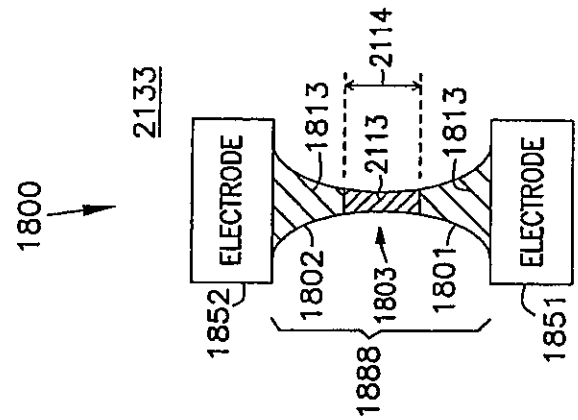

FIG. 21

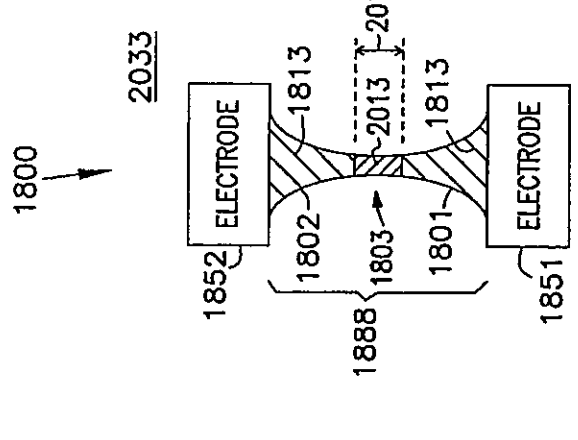

FIG. 20

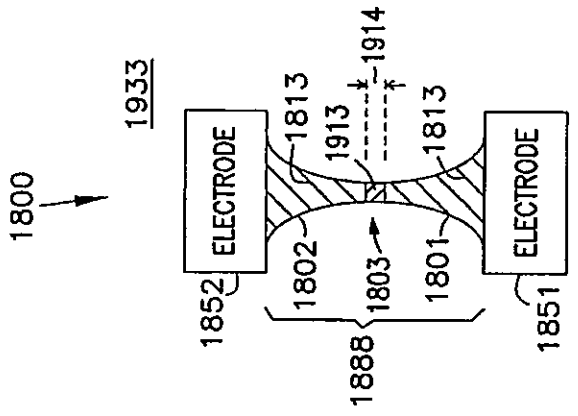

FIG. 19

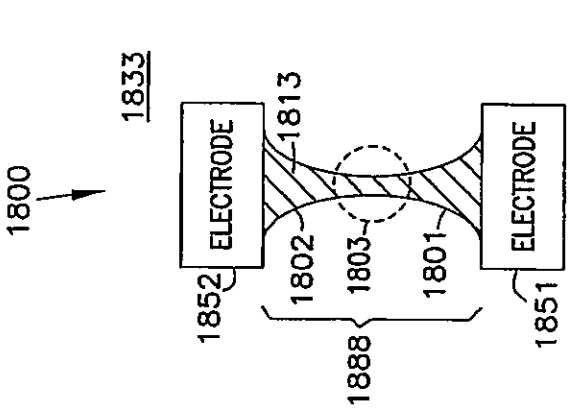

FIG. 18

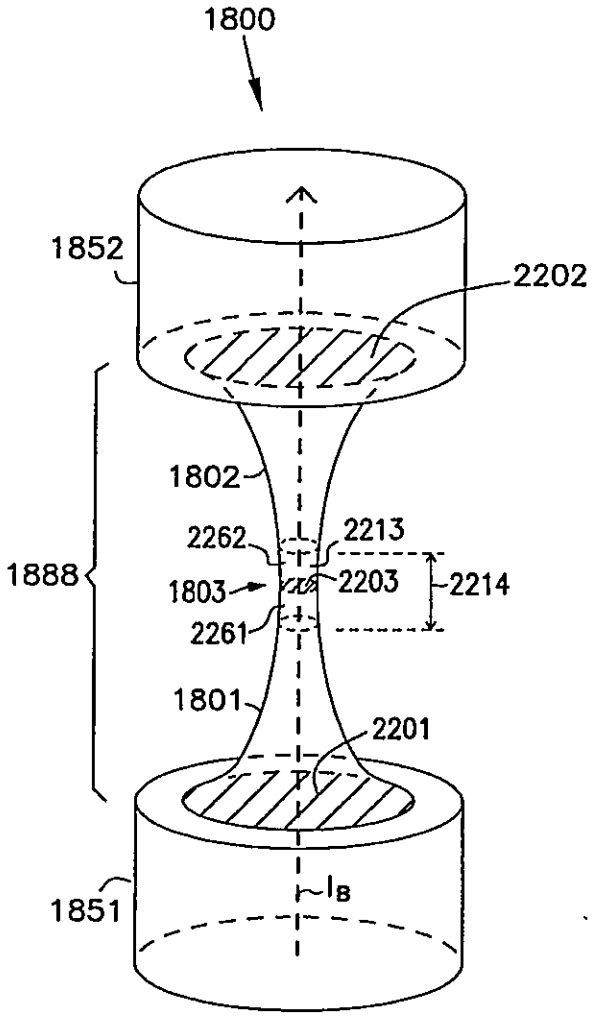
1800
1852
2202
1802
2262
2213
1888
1803
2203
2214
2261
1801
2201
1851
I_B

FIG. 22

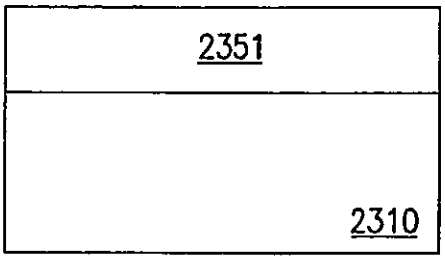

FIG. 23

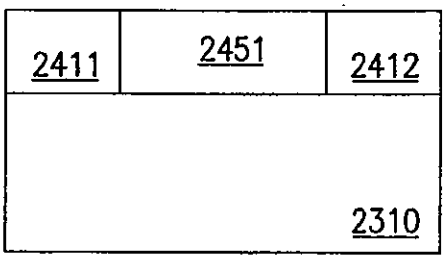

FIG. 24

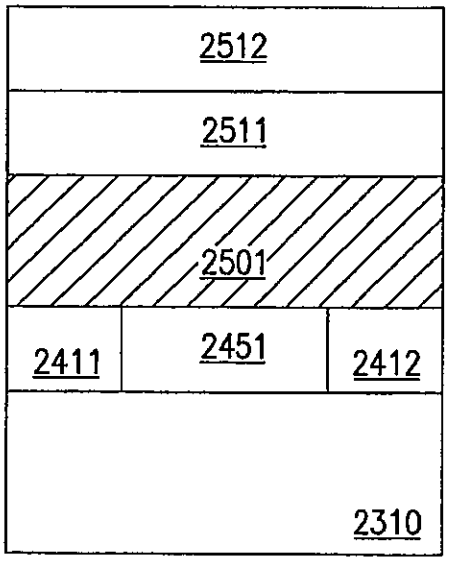

FIG. 25

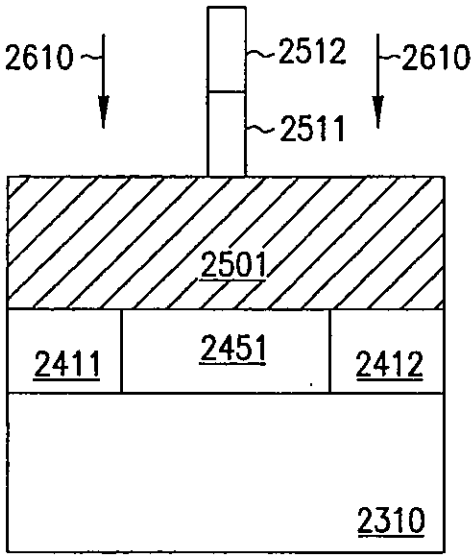

FIG. 26

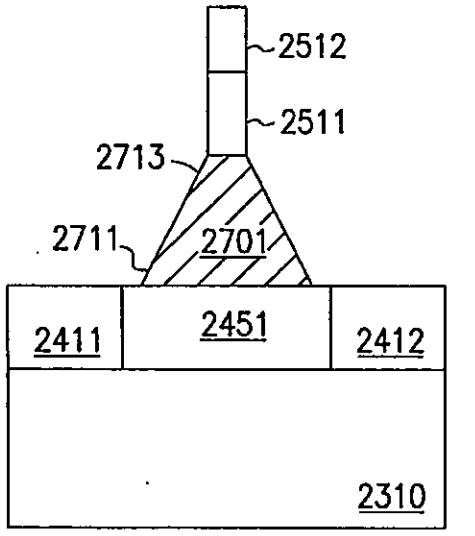

FIG. 27

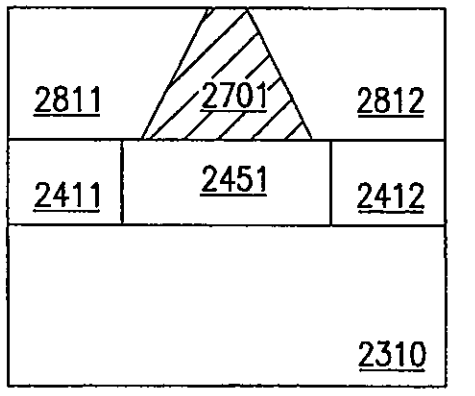

FIG. 28

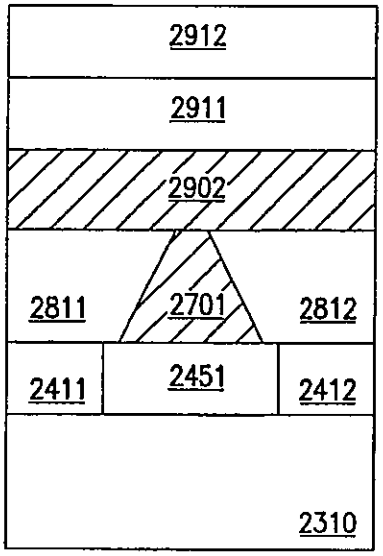

FIG. 29

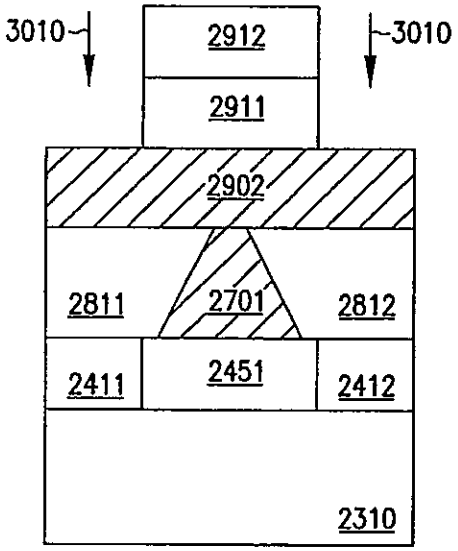

FIG. 30

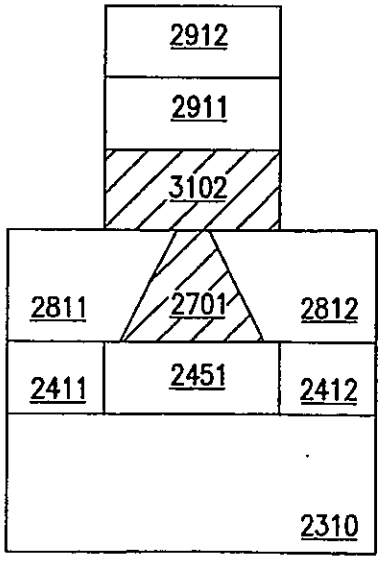

FIG. 31

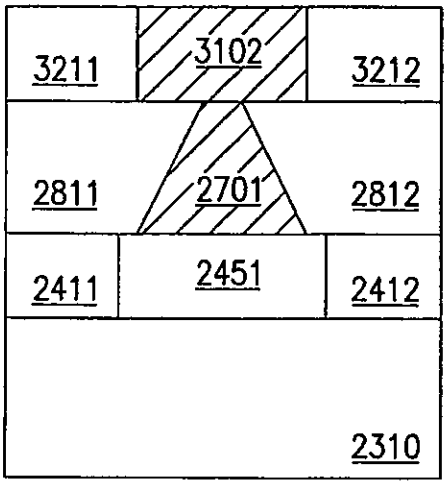

FIG. 32

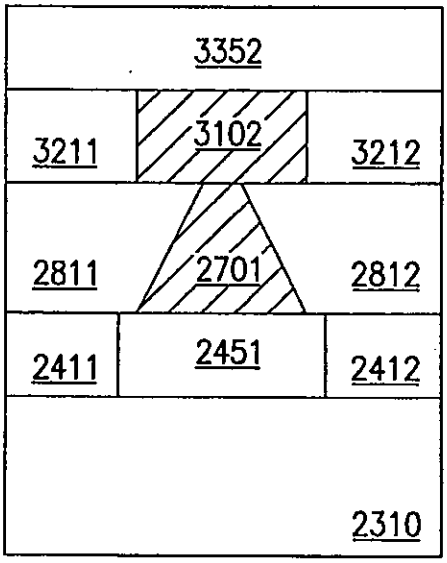

FIG. 33

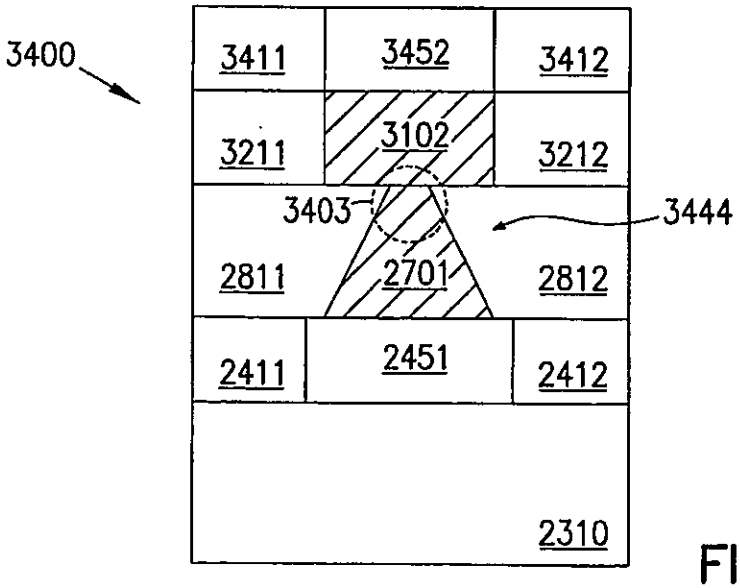

FIG. 34

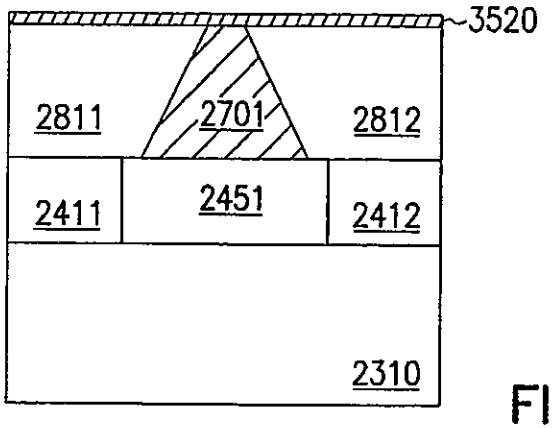
3520
2811
2701
2812
2411
2451
2412
2310

FIG. 35

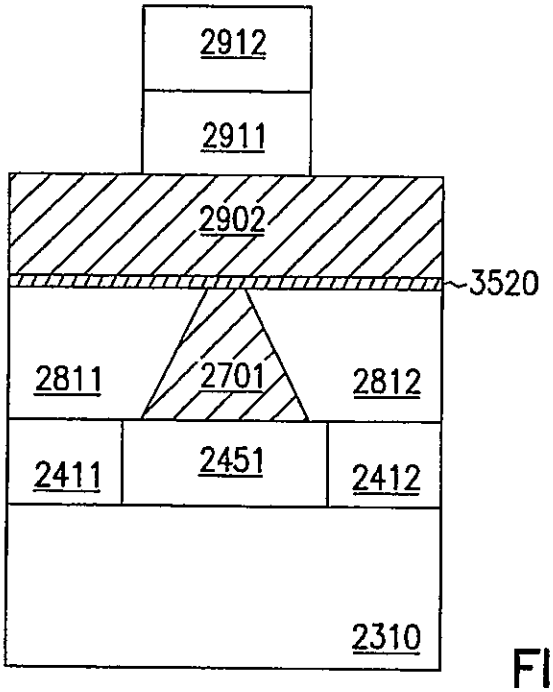
2912
2911
2902
3520
2811
2701
2812
2411
2451
2412
2310

FIG. 36

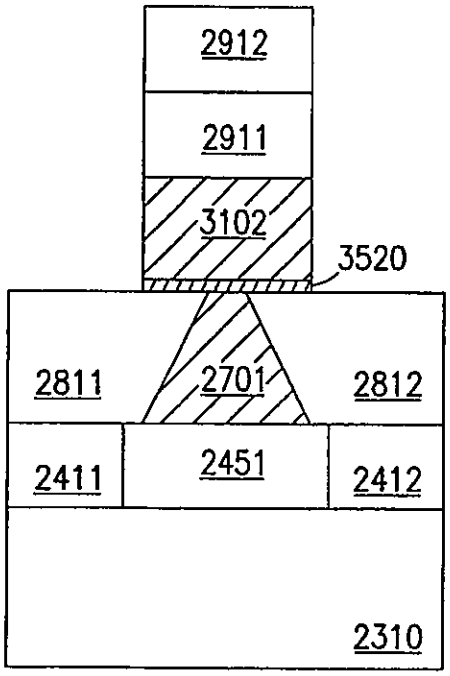
2912
2911
3102
3520
2811
2701
2812
2411
2451
2412
2310

FIG. 37

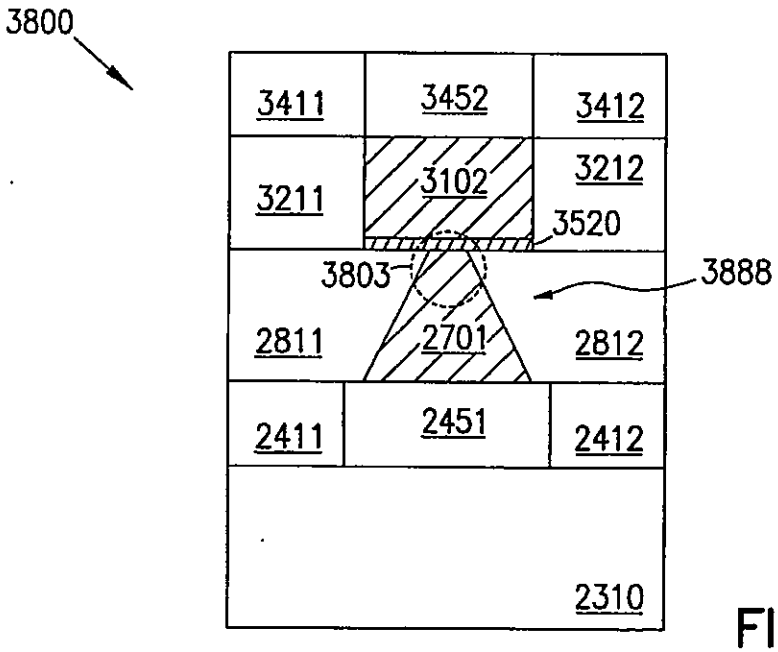
3800
3411
3452
3412
3211
3102
3212
3520
3803
3888
2811
2701
2812
2411
2451
2412
2310

FIG. 38

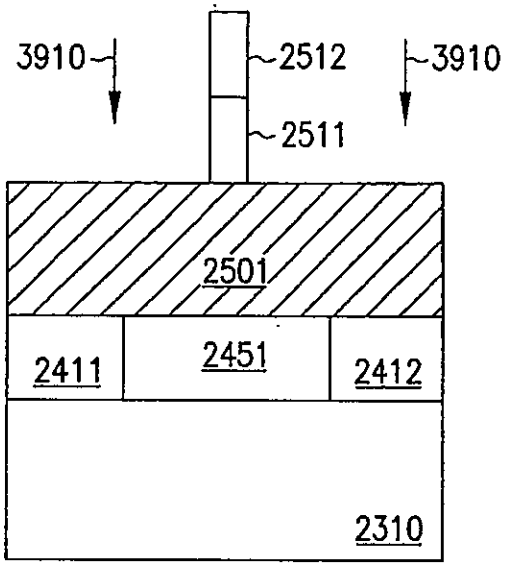
3910
2512
3910
2511
2501
2411
2451
2412
2310

FIG. 39

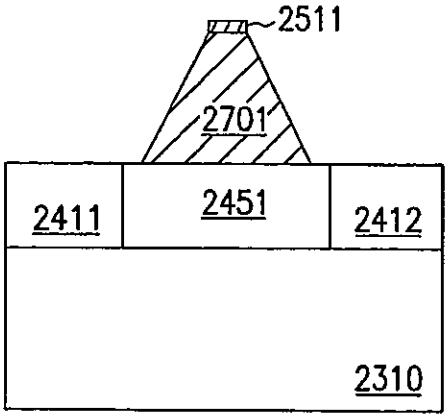
2511
2701
2411
2451
2412
2310

FIG. 40

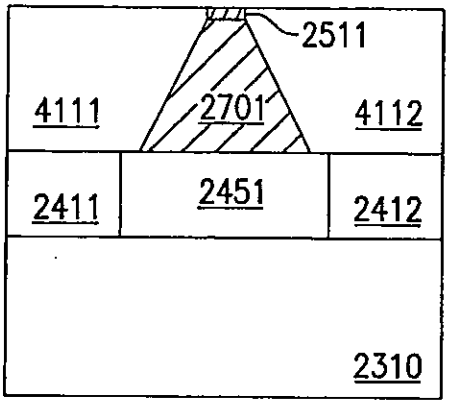
2511
4111
2701
4112
2411
2451
2412
2310

FIG. 41

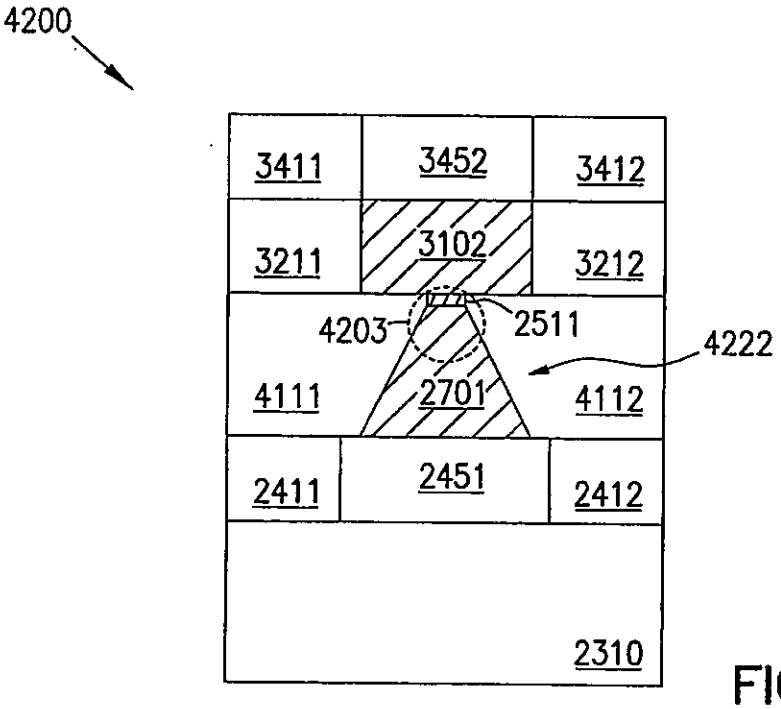
4200
3411
3452
3412
3211
3102
3212
4203
2511
4222
4111
2701
4112
2411
2451
2412
2310

FIG. 42

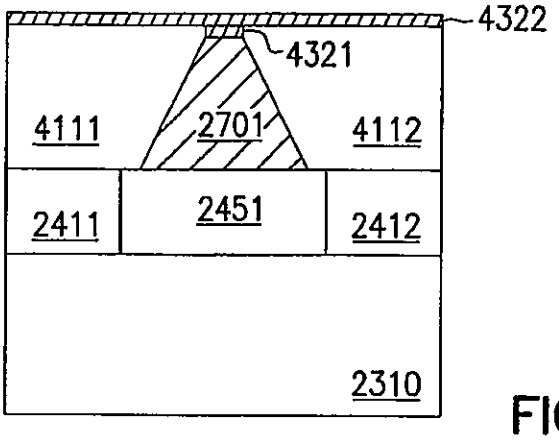
4322
4321
4111
2701
4112
2411
2451
2412
2310

FIG. 43

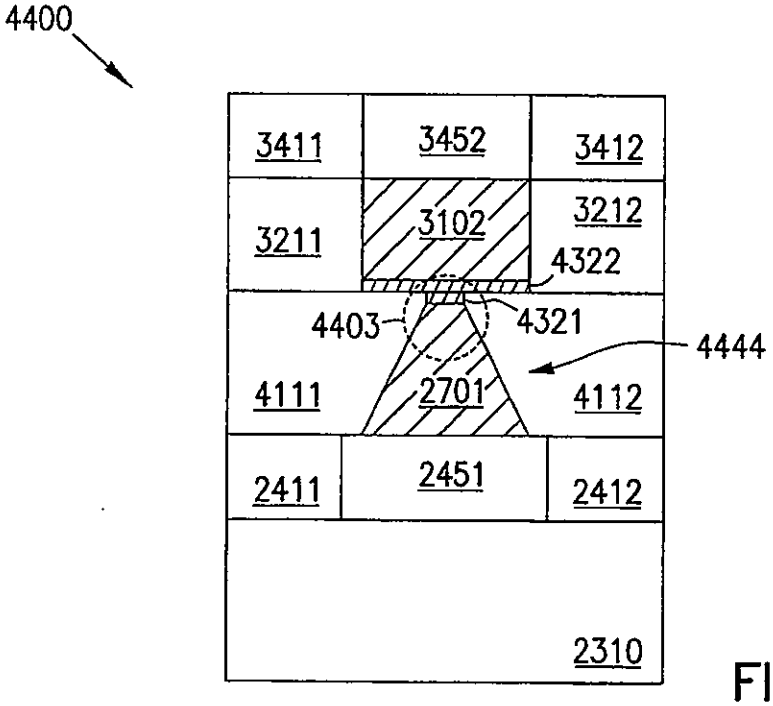
4400
3411
3452
3412
3211
3102
3212
4322
4403
4321
4444
4111
2701
4112
2411
2451
2412
2310

FIG. 44

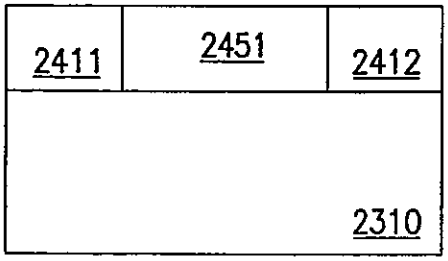

FIG. 45

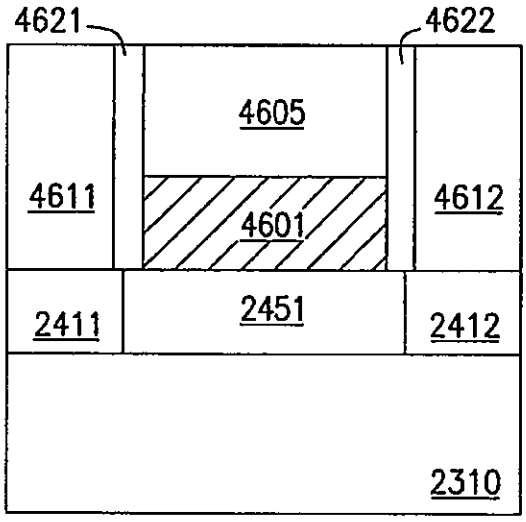

FIG. 46

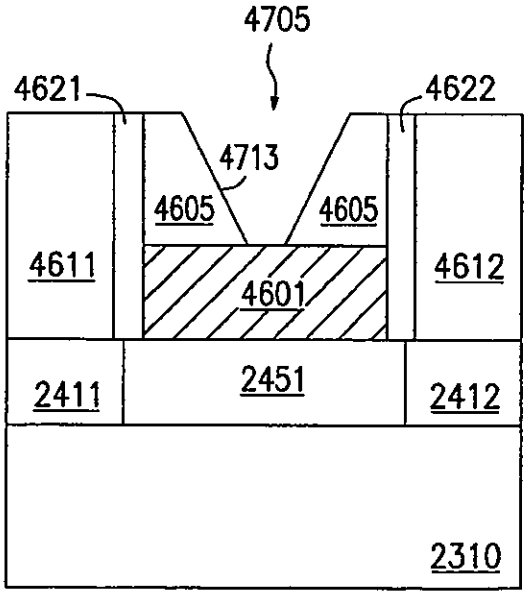

FIG. 47

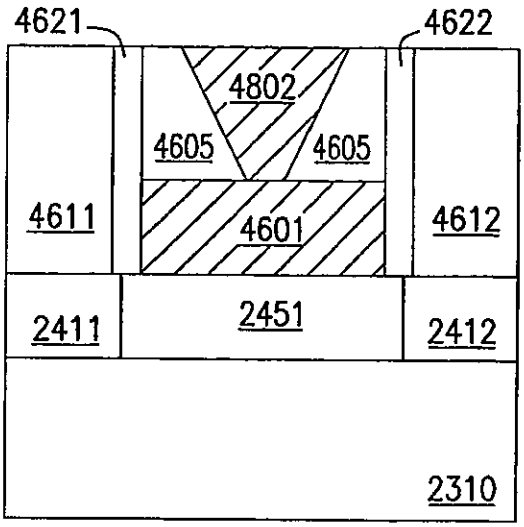
4621
4622
4802
4605
4605
4611
4601
4612
2411
2451
2412
2310

FIG. 48

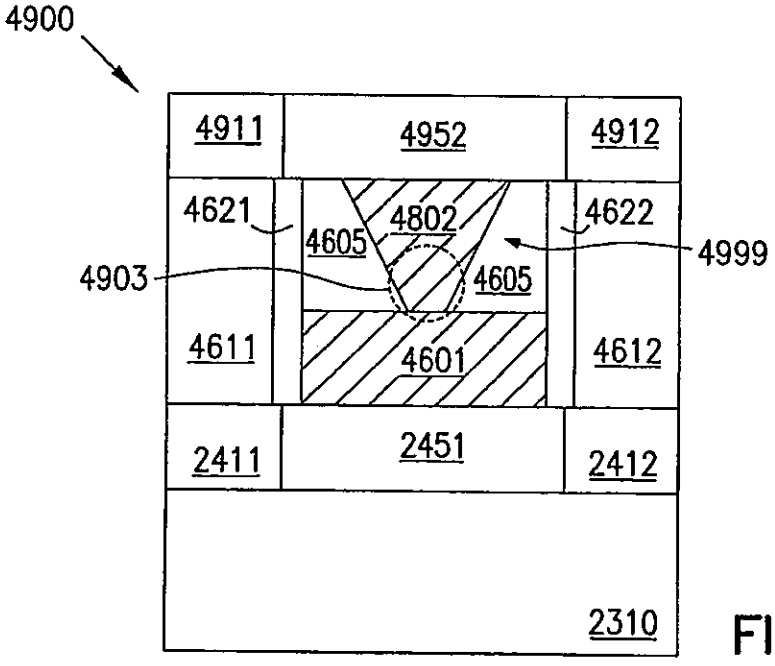
4900
4911
4952
4912
4621
4622
4802
4605
4999
4903
4605
4611
4601
4612
2411
2451
2412
2310

FIG. 49

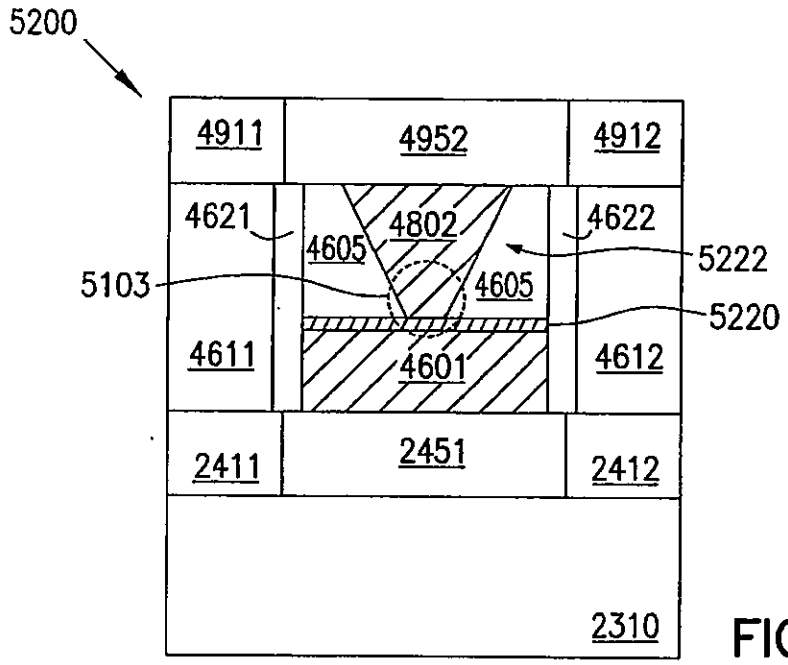
5200
4911
4952
4912
4621
4605
4802
4622
5222
5103
4605
5220
4611
4601
4612
2411
2451
2412
2310

FIG. 52

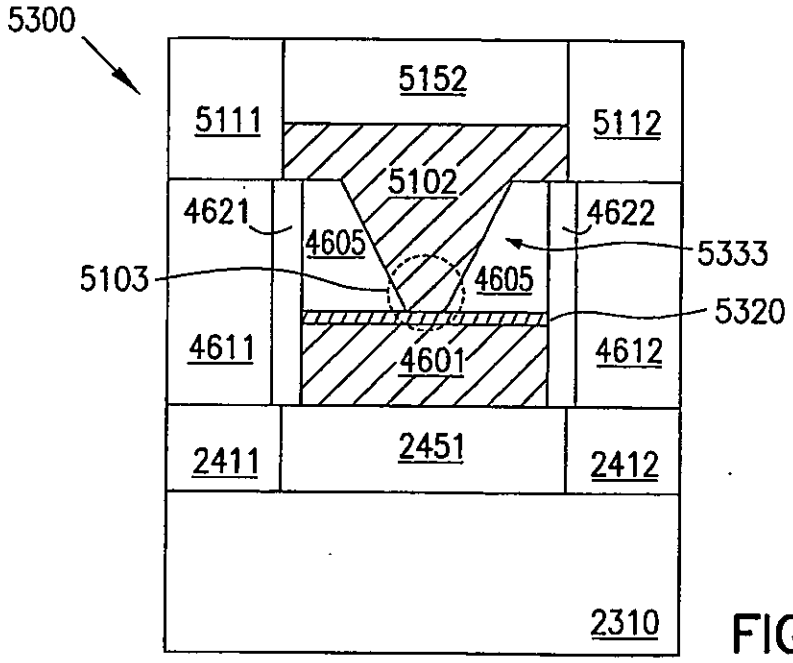
5300
5152
5111
5112
5102
4621
4605
4622
5333
5103
4605
5320
4611
4601
4612
2411
2451
2412
2310

FIG. 53

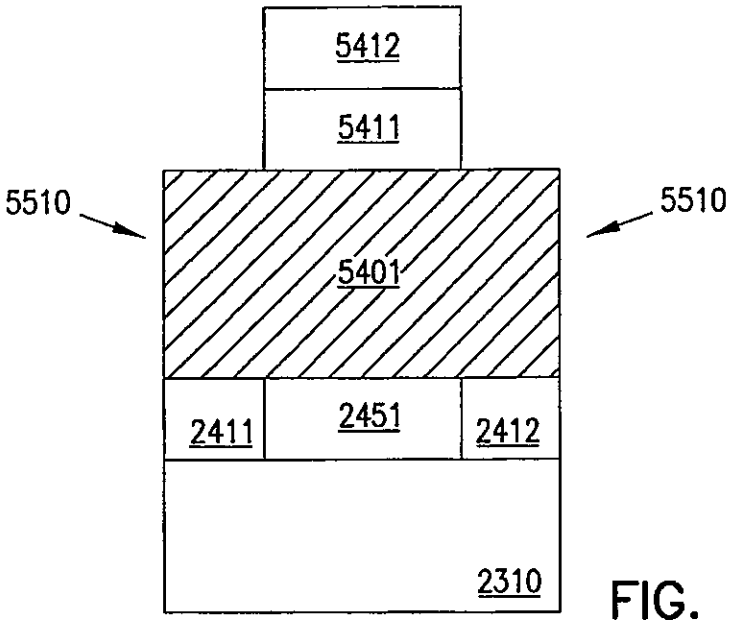

FIG. 54

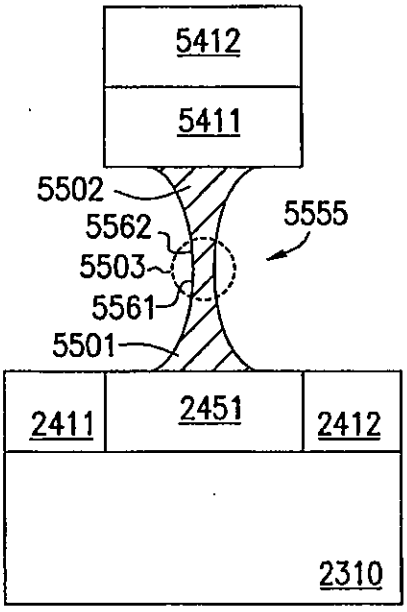

FIG. 55

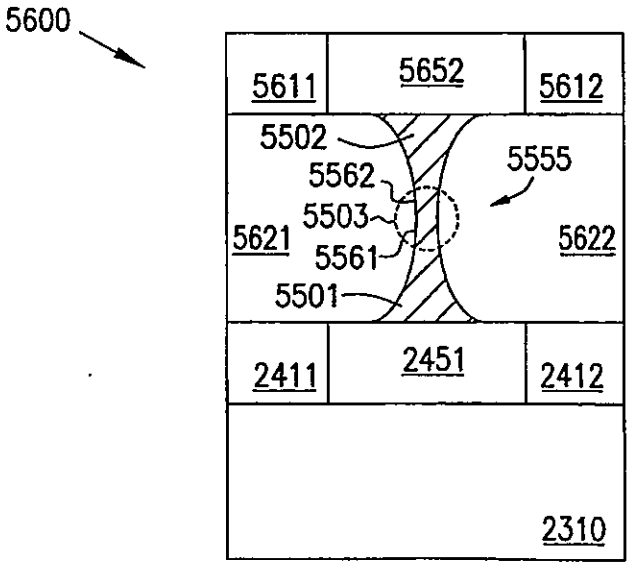

FIG. 56

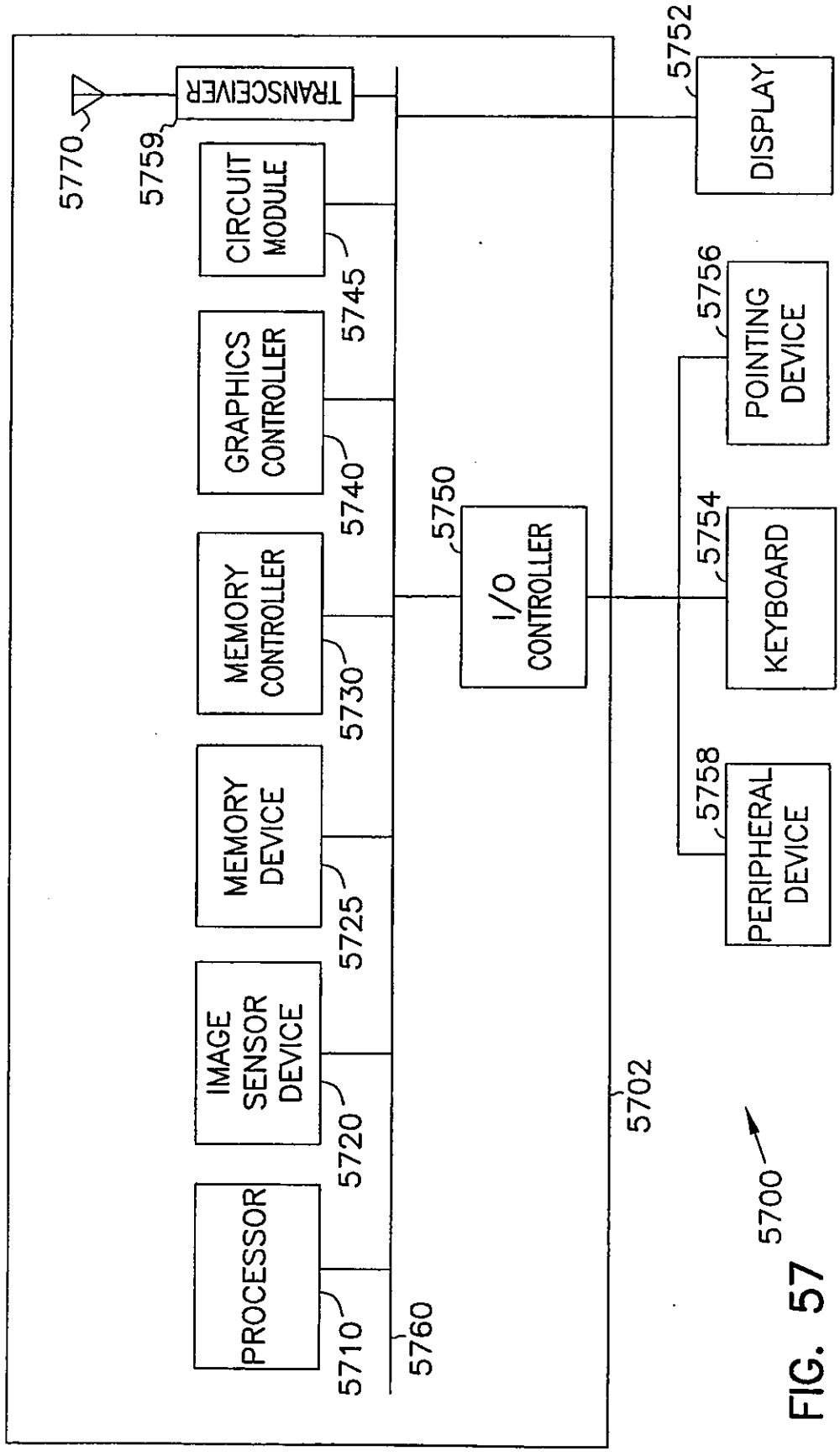
5770
5759
TRANSCEIVER
CIRCUIT MODULE
GRAPHICS CONTROLLER
MEMORY CONTROLLER
MEMORY DEVICE
IMAGE SENSOR DEVICE
PROCESSOR
5710
5720
5725
5730
5740
5745
5750
5752
DISPLAY
5756
POINTING DEVICE
5754
KEYBOARD
5758
PERIPHERAL DEVICE
I/O CONTROLLER
5760
5702
5700

FIG. 57