

(19)
(12)

(KR)
(B1)

(51) 。 Int. Cl. ⁷
H01J 9/12

(45)
(11)
(24)

2003 03 29
10 - 0378103
2003 03 17

(21) 10 - 2000 - 0009280
(22) 2000 02 25

(65)
(43)

2000 - 0062634
2000 10 25

(30) 1999 - 48892 1999 02 25 (JP)
1999 - 58459 1999 03 05 (JP)
2000 - 25582 2000 02 02 (JP)

(73) 가 가
3 30 2

(72) 3 30 2 가 가
3 30 2 가 가

(74)

:

(54) ,

I wire)가 . (Y1) (X1) (row - directional wire) (Y0) (X0) 가 (column - directiona
가 ,

1

, , , ,

1

2a, 2b, 2c, 2d 2e 1

3

4 1

5 4 5 - 5

6a, 6b, 6c, 6d, 6e, 6f 6g 1

7a, 7b, 7c, 7d 7e 2

8

9

10 3

11 4 5

12 6

13 6

14 6

15 6

16

17

18

19

20

21a 21b

22

23

24

25

<

2, 3, 202, 203 :

2', 3' :

5, 6, 61, 62, 72, 73 :

5', 6', 61', 62' :

9 :

65, 65 :

5,942,849 [(Neil Alexander Cade)] 2 ()

가 가 5,654,607

(field emission type; FE), / / (metal/insulator/metal type; MIM),

FE " [W. P. Dyke & W. W. Dolan, Advance in Electron Physics, 8, 89 (1956)] " "[C. A. Spindt, J Appl. Phys., 47, 5284 (1976)]

MIM

" -

"[C. A. Mead, J. Appl. Phys., 32, 646 (1961)]

[10, 1290 (1965)]

가

["Thin Solid Films", G. Dittmer, 9, 317 (1972)], In SnO_2 [M. Hartwell & C. G. Fonstad, IEEE Trans. ED Conf., 519 (1975)], $2\text{O}_3/\text{SnO}_2$ ["Vacuum", Hisashi ARAKI, et. al., Vol. 26, No. 1, p. 22 (1983)]

(M. Hartwell)

가 19

(401)

, H

(404)

19

(405)

(energization)

19

(L)

0.5

1 mm

(W')

0.1 mm

(404)

(405)

(404)

(405)

(404)

가

(404)

(405)

(1, fissure)

()

(2

)가

()

(,

64 - 031332

, 1 - 283749

, 2 - 257552

) .

(back light)

5,066,883

가

가

6 - 342636

20

20

(73)

(72)

21a , 21b 21a 21B - 21B
 (202, 203) , (202, 203) (204) , (201)
 (204) (205) ,
 (202, 203)
 (204) (202, 203), (204) (204)
 (202, 203)
 100 5000 (Rs)
 $R = R_s(l/w)$ Rs가 R (t), (w) (l)
 , Rs = /t
 (t) ()

22 6 - 342636 (81),
 (82) (86) (glass frit) (81),
 (88) (71) (81)
 (71) , m x n (m n)
 2 (72) n (73) 22 (74) m
 (71), (72, 73)
 (73) (74), (72)
 (multi electron beam source)
 (72, 73) (72, 73)

() 3 (84) (86) , (84) (R), (G) (B)
 . Al (85) (81) (84) (84)

Dxl Dxm Dyl Dyn () , Dyl Dyn
 . Dxl Dxm
 1.33 x 10⁻⁴ Pa
 (81) (86)
 (86) (81)
 가 (71) (86)
 Dxm, Dyl Dyn) (72, 73) 가 (Dxl
 가 , V kV (85) 가 ,
 가 (86) 가

가

9 - 293469

8 - 34110

가 가 (baking)

(100) 24 (100) (42) 23 (42)

(41) (42) 23

가

23 (42) (41)

(45) (42) (47) (100)

e; 43) (47) 가 (45) (42) (42) (42) (squeege

(46) (100)

(100) (42) (48) (43)

(42)가 가 (44) (100) (47)

(43) (43) (43) (42)가 (100)

(43) (43) (47) 23 (45) (100)

(42) 가 (44) (42) (10)

0) (46) (100) (47) (42) 23

" " ") 가 , (" ,
 (402) 3X3 9 3 ,
 3 가 25 , 가 ,
 (402) 25 , (40 (40
 2) 가 (402) (401) 가 , (401)
 가 (402) 가 .

가 .
 (1) .

가 .

(2) 가 , .

(3) 가 (,) . (1) (2) 가 .

(4) 가 .

가 가 , 2 가 가 가 .

1 1 , 1 1
 1 1 1 가 , 1 1 가
 , 1 / .
 가 1 가 .
 가 1 가 2 , 2 1 2 .
 가 1 가 2 가 .
 2 가 1 2 가 , 2 .
 1 가 , 2 1 2 .
 가 , 1 2 .
 2 2 2 , 2 .
 2 가 가 1 2 1 가 2 .
 2 가 , 2 가 2 .
 1 2 2 , 2 2 ,
 2 2 , 1 2 2 1 , 2
 2 2 가 , 2 2 2 가 2
 2 2 .
 2 가 2 가 2 2 가 2 .

가
가 20%

2 2

2 2 2 10 , 2

2 가 가

1 가 1 2 1 1 1

, 1 1

1 1 가 1 1 가 1 2

1 1 1 10 , 1
1 1

1 가 가 가 가 가
1 2 가

, 1 , 1 , 1 2 , 1 2 2
가 , 1 2 1 2
1 , 1 가 1 1 ,
1 1 ; 2 가 2 2 , 2 2
2 가 , 2 , 2

, , 1 가 , 1

(1 (D)) Y1 (6) (6') (F)) Y1
 (6) (6') (E) (6) (2', 3')

(5') (5) (6')

가
 (4) , (4) (5) (2) , (4) (6)
 (3) (2, 3) (4) (5, 6)
 (step coverage)" (wettability)"
 5, 6)

가
 가

(2) (2') (1) (5')
 가 , (3) (3') (1) (6')
 (4) (2', 3') (2', 3') X1 (5) Y1
 (6)

(2', 3')
 (9) (5, 6) 가 , 가
 (5) (6) (5') (6') 가
 (5') (6') (1) 가 (6')
 (5, 6) (5') (9)
 가 (5') (5', 6') (5', 6') (5', 6')
 (6') (9) (5') (6') (5', 6')

(5') (6') 가

(9)

(5') (6') (5, 6) 10

(5') (5) (6') (6)

(6') 가 (5') (5, 6)가 (6') (5') (6)

(5, 6)가 가 가 (5, 6)

가 가 가 가 가

(5') 가 가 가

(5) 가

(5') (6') 1 (5) (6) 가

(5') (6') (5) (5') 2 (6') (5)

(6) 2 (5) (6) (5') 2 (6')

(5') X1 (5) (1)

(5') (1) (5') X3 (6')

2a 2e 2a 2e (1) 1

a 2e (9) 2

2a (1) (2, 3) (2', 3') 2a

(2, 3) (2', 3') (sputtering) CVD, (2, 3)

(2', 3') (2, 3)

2b (6) (6') (3) (3')

(Ag) (1)

(1) 가 (6)

(6')

2c (7) (7) SiO₂ PbO (6')

(6) (6')

(7) (6) (6') (5) (5')

6') (5) (5') (6) (5) (2') (2)

(5')가 (2) (2') (7) (2)

(8) 2c (7)

(5) (5')가 (2) (2')

(6) (6')가 (5) (5')

2d (5) (5')가 (5) (2')

(5') (7) (7)

2e (9)

5,591,061 가 2836015

() 가 (9)

3 3

(18)

(11), (12) (16) (18) (R), (G)

(9) (14) (16) (15) (11) (14) (14)

(B) 3 ()

(14) (14)

3가
(lead) 가

가

가

(15)

(16)

(15)

가

(18)

가

가

(15)

()

(16)

Y1 Tox1 Toxm Toy1 Toyn (5) X1 Xm (6)
6) Yn Yn Tox0 Toy0 (5') X0 (

Toyn 가 , 가 ()가 Tox1 Toxm Toy1
(6') 가 , (5') Y0 (1) X0 Y0 (1) (5') X1 (6) Y1
(1) 가

(5')가 (5) (6')가 (6)
, Tox0 Toy0
(9) 가 (17) (15) 가
(15) 가
가 (5') (6') 가

[]

(1)

(9)

(80)

(120)

4

4

5

4

5 - 5

5

5

6a 6a 6g 4 5
6g 4 5 - 5

A

0.5 μ m

(1) (Cr) (Au)
(AZ 1370, Hoechst Aktiengesellschaft)

5nm 600nm

(1)

(5;) (5')

/

(5)

(5')

6a

B

(7) 6b (21) (7) RF 1.0 μ m

C

6c (21) (21) 가
(7) (21)

가 CF₄ H₂

D

6d (2, 3) (2, 3)
(RD - 2000N - 41, 가) (Ti) (Ni)
5nm 100nm
(2, 3) - (lift - off) (2, 3) 20 μ m

E

E, 6e (6;) (6')가 D
 (6) (6')

D, (Ti) 5nm 500nm (6)
 (6')가

F, 6f (4) (4) (4)
 (Cr) (Cr)

Pd (ccp 4230, Okuno Pharmaceutical K. K.) PdO (4)
 , 300 10 가 ,
 (Cr)
 PdO (4)
 10nm

5×10^4

G (21) (Ti) 5nm 500nm
 (Au)/ (Ti) 6g (Au)/ (Ti)

H (4) 가 (5),
 (5'), (6), (6'), (7), (2, 3) (4)
 (9) 가 (6)
 (5) (5) 가
 1msec , 3msec 11V
 가 (5) 가 (5)
 (5) 240msec 가 가
 (5) 1msec 240msec 가

(9) 50 가 가 가 가
 (H₂) (N₂) 가
 (5) 가

I
 ,
 1.3 × 10⁻⁴ Pa

(5) (H) 가 , 10 (5) 가 , (H)
 가 ,
 msec , 16 V (If) 가 가 (4)
 , 가 가 , (9) 가 300
 , 가 ,
 (5) 가 , (9) . 1 kV 가 가 , (6) 가
 (le)
 (1)
 1 , 1 X0 (5') Y0 (6')가
 1 . 1

	Ie (Y1)	σ_{y1}	Ie (X1)	σ_{x1}
제1 실시예	1.8 μ A	0.1 μ A	1.8 μ A	0.1 μ A
제1 (비교예) 실시예	2.1 μ A	0.4 μ A	2.0 μ A	0.5 μ A

1 (9) , Y1 (6) 80 가 1.8 μ A
 (le) 0.1 μ A y1 , X1 (5) 120 가 1.8 μ A
 (le) 0.1 μ A x1 , 1
 , Y1 (6) 2.1 μ A (le) 0.4 μ A y1
 , X1 (5) 2.0 μ A (le) 0.5 μ A x1
 . 1 , 1 (9)
 가

(2)
 1 , ,
 . 2 ,
 2 7a 7e , 3x3
 9 , 720
 240

7a (soda lime) (2, 3) (2', 3')

"MOD(Metal Organic Deposition)"

가 8 70 10 550

50 μm \times 200 μm (2, 3) (2) [(2')] (3) 3

μm (3) 20 μm YO (6') 500 μm \times 150 μm (3') 0.3

(3) YO (6') (6) Y3 (6) 7a

(6')

(3', 3) 가

7b (6) (6')가

(Ag) Ag

110 20 550 가 15

12 μm (6) (6') 100 μm

7c (7)

PbO 110 20

550 가 15 500 μm 30 μm

(7)

7d (5) (5) (5) (6) (5')가 (7)

(5) (5') (6') (6')

7e (4) (2, 3)

(5') (6') (2', 3')

(4)

Pd (2, 3)

(4) PdO (4) 300 10

(4) 1

3 가 (9)

(11), (16) (12) (18)

(9) (16) 5 mm 가

가 (18) (18) (18) (gettering)

(getter)가 (18) , RF 가

3 (16) (14) (metal back)(15)가 (13)
 (14) (R), (G) (B) 3
 (51) 8 R, G B
 (52) (51) (52)
 (51) " (black stripe)" (51)

9 (14) (52) (51)
 " "
 1 (energization forming operation) 가

(9) (18)가 (18) 1.33×10^{-4} Pa
 가 가 가
 1 msec , 10 msec 10 V
 60
 1 (18) 가 (18)
 가 (18) 가 가

가 RF 가 가 Ba . Ba가
 (18)

(3)
 10 2 (9)
 (5') X0 X0' (6') Y0 Y0' . X0' (3')
 5') (6') 2

(2)
 , 2 3 (5'), (6') (2', 3')

8 kV 가 (9) (17) (15)
 가 (5') (6') (17)

X1 (5) Y1 (6) (le) 1
 1 kV 가 가 (G) 25 μ s 60 Hz
 가 2 3 가 가
 (black stripe) 1/5

	Ie(Y1)	σ_{v1}	Ie(X1)	σ_{x1}
제2 실시예	1.7 μA	0.1 μA	1.7 μA	0.1 μA
제3 실시예	1.6 μA	0.1 μA	1.6 μA	0.1 μA
제2 비교 실시예	1.9 μA	0.35 μA	2.0 μA	0.4 μA

	휘도(Y1)	σ_{v1}	휘도(X1)	σ_{x1}
제2 실시예	4000 cd/m ²	150 cd/m ²	4100 cd/m ²	160 cd/m ²
제3 실시예	3900 cd/m ²	130 cd/m ²	3900 cd/m ²	145 cd/m ²
제2 비교 실시예	3700 cd/m ²	500 cd/m ²	3800 cd/m ²	540 cd/m ²

2 3 , 2
2 3 . 2

가

3 (6')가 Y0 , (3') Y0' 가
(6') (3) 2 , 3 (6') 가
(6')가

(6')

(4 5)

4 5 , (potential)

4 (5) , 11 (10) X0 (5) X2
(10) X1 (5) Y1 (6)
, Y0 (6') Y1 (6)

5 , X0 X1 (5)

2 가가 가

	Ie(Y1)	σ_{v1}	Ie(X1)	σ_{x1}
제4 실시예	1.7 μA	0.1 μA	1.7 μA	0.1 μA
제5 실시예	1.7 μA	0.1 μA	1.8 μA	0.11 μA

	휘도(Y1)	σ_{v1}	휘도(X1)	σ_{x1}
제4 실시예	4000 cd/m ²	150 cd/m ²	4100 cd/m ²	160 cd/m ²
제5 실시예	4100 cd/m ²	160 cd/m ²	4300 cd/m ²	200 cd/m ²

5 X1 (5) (le)

(5) (5) 가 , (6) 가 , 가 X2 (5)

(5) 가 , X1 (5)

(5') (5) 가 (

(6)

(5') (6')가

12 14

15

(2, 3)

9

480 X 1920

(2, 3) 20 μm , 0.9 mm ,

0.3 mm (6) (6') (6)

12 (6')가 (6) , 10

(6)

2)가 가 16 (61) (6

SUS 400 가 , 100 (6') 가 500 12 ,

(6)

, SUS 300 (7)

(63) 17 (8)

(6) (64) 13 (8) (

7) 100 (7) 530 (8) 3

(7)

, SUS 300 (65)

(66) 18 (5) (5')

가 14 (7) . 10 (

5')가 (5)

(5) (5') (6)가 (6')가 (1) 가 ,

(5) (6)

6.

4 5 , 2 , 2 2 2 , 2 2 가
2 2 2 .

7.

6 , 2 1 2 .

8.

1 4 , 1 2 2 가 ,
2 2 2 1 2 2 가 ,
1 2 2 가 , 2 2 2 가 ,
2 2 가 2 2 .

9.

8 , 2 2 가 2 2

10.

9 , 2 2 가 2 2

11.

6 , 2 2

12.

6 , 2 2 10 .

13.

5 , 2 가 가 .

14.

1 , 1 1 .

15.

1 , 1 1 가 1 1 .

16.

1 , 1 1 .

17.

1 , 1 1 가 1 1 .

18.

17 , 1 1 가 1 .

19.

1 , 1 1 10 .

20.

1 , 1 가 가 .

21.

1 2 , 1 , 1 2 2 .

1 1 1 , 2 2 2 .

1 1 1 가 , 1 1 .

2 2 2 , 2 2 .

22.

1

1

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1

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1

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1

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1

1

23.

1

1

,

1

,

1

,

1

,

1

1

1

24.

1 , 21

23

,

가

25.

,

,

,

,

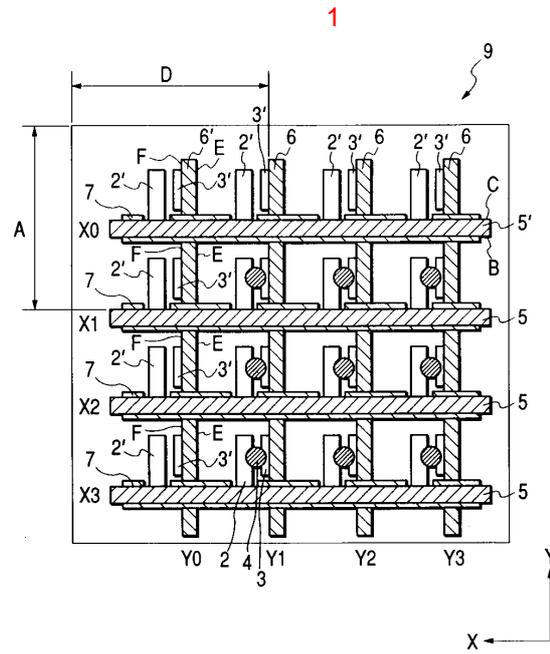
26.

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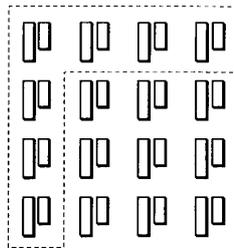
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,

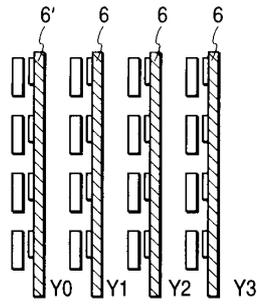
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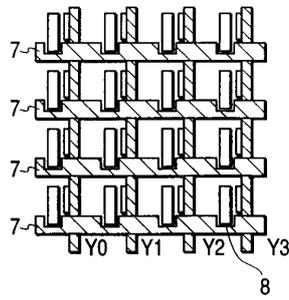
2a



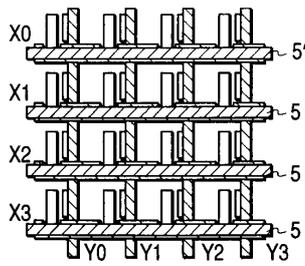
2b



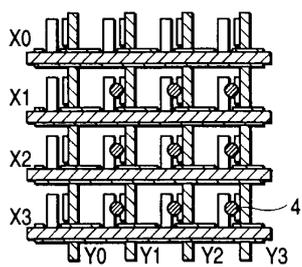
2c



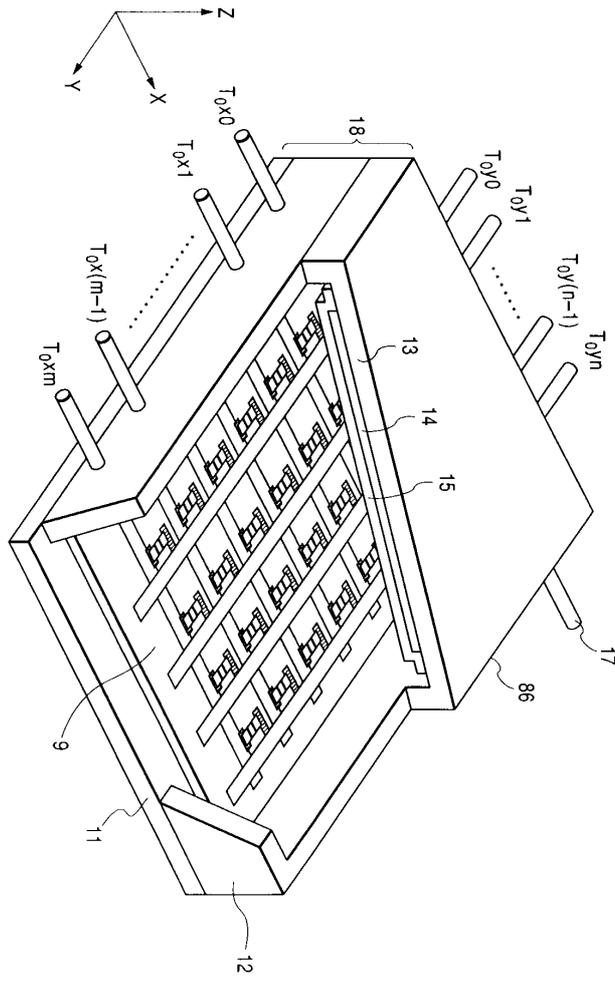
2d



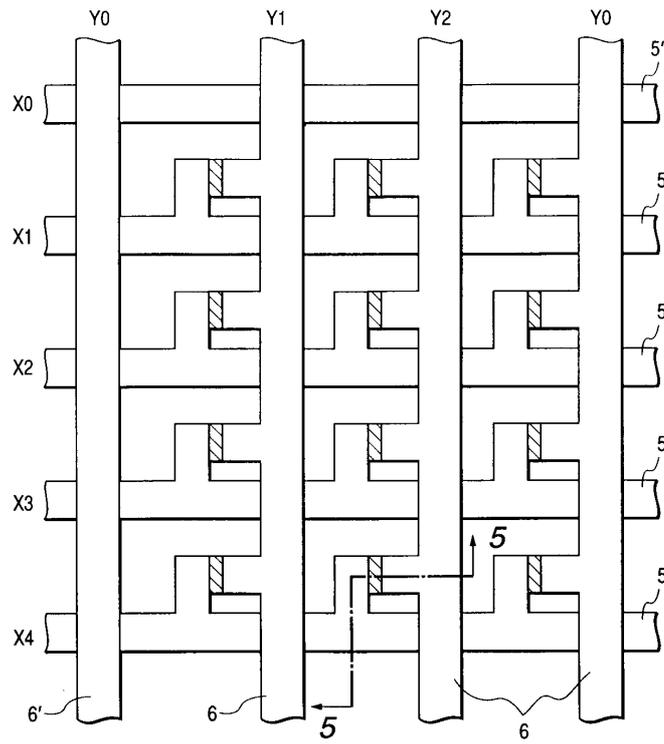
2e



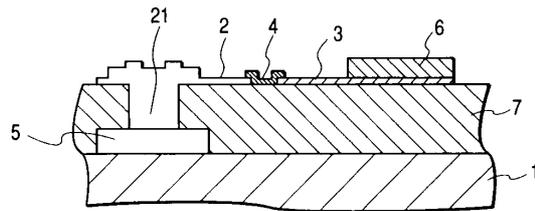
3



4



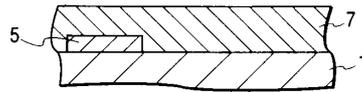
5



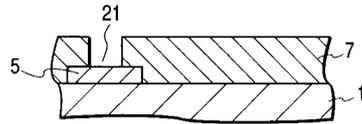
6a



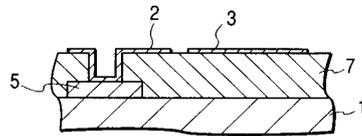
6b



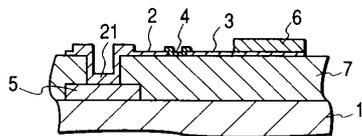
6c



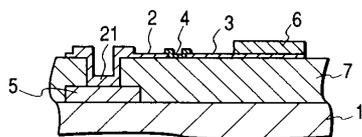
6d



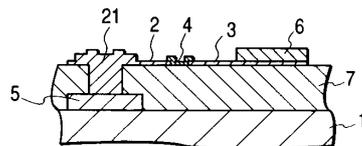
6e



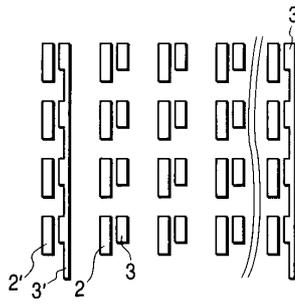
6f



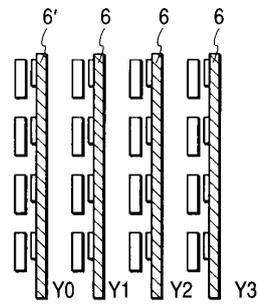
6g



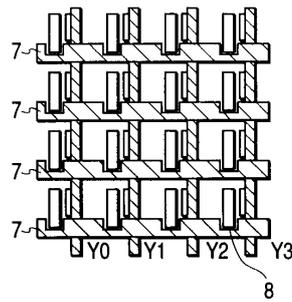
7a



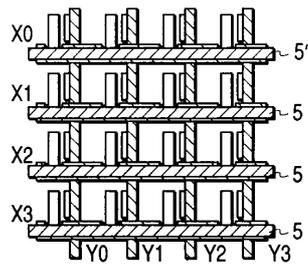
7b



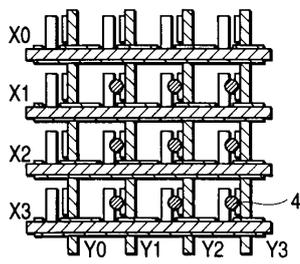
7c



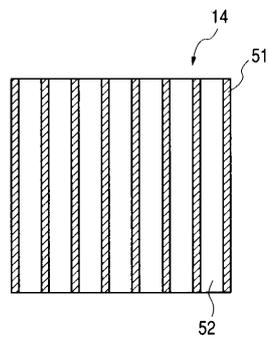
7d



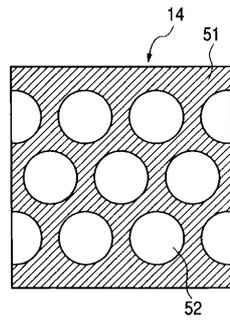
7e



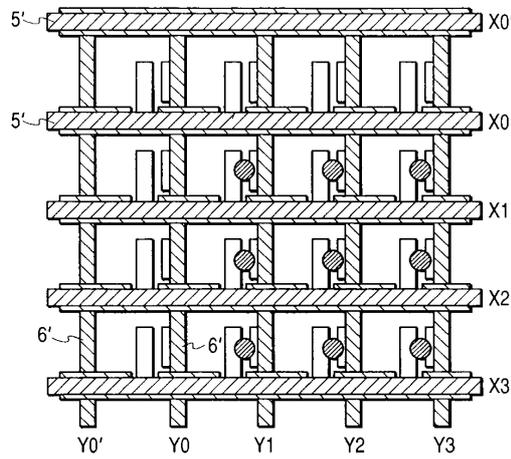
8



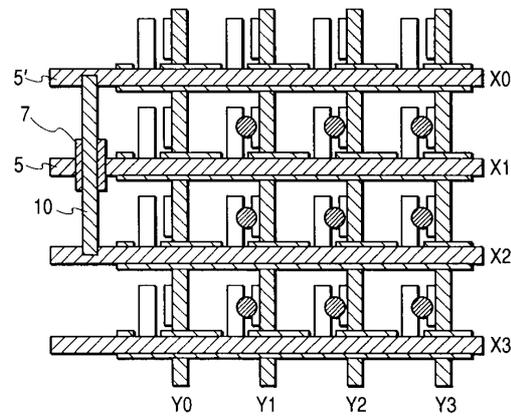
9



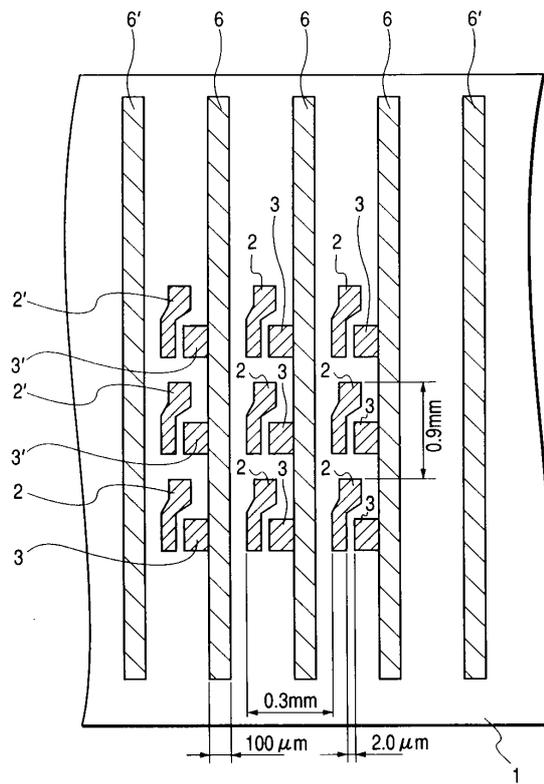
10



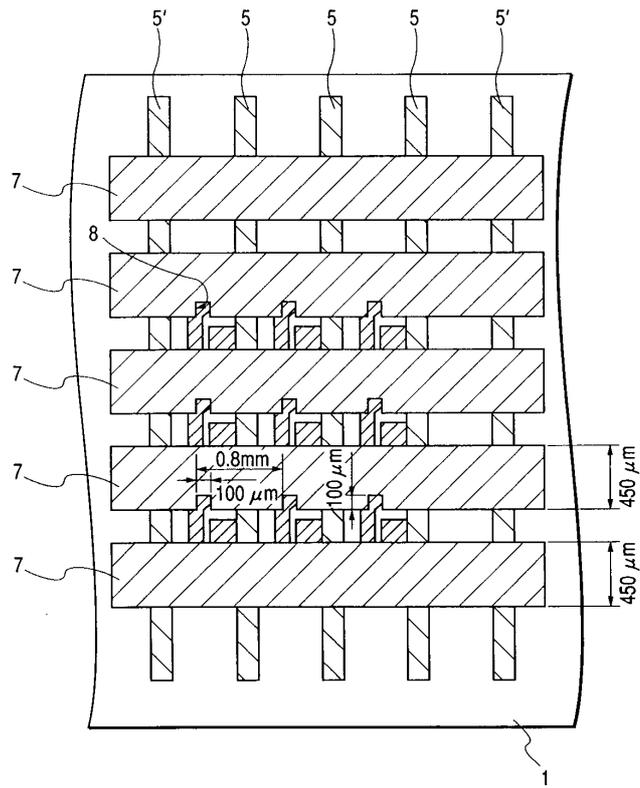
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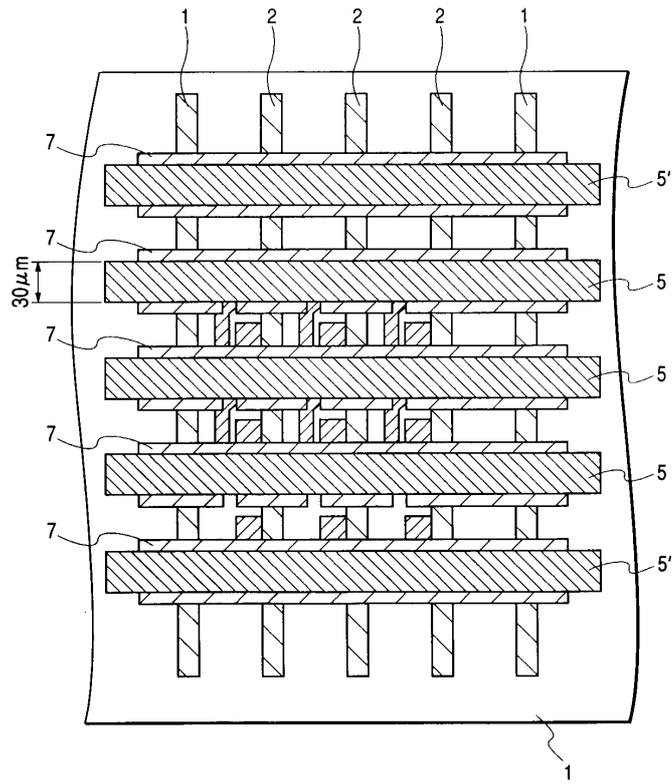
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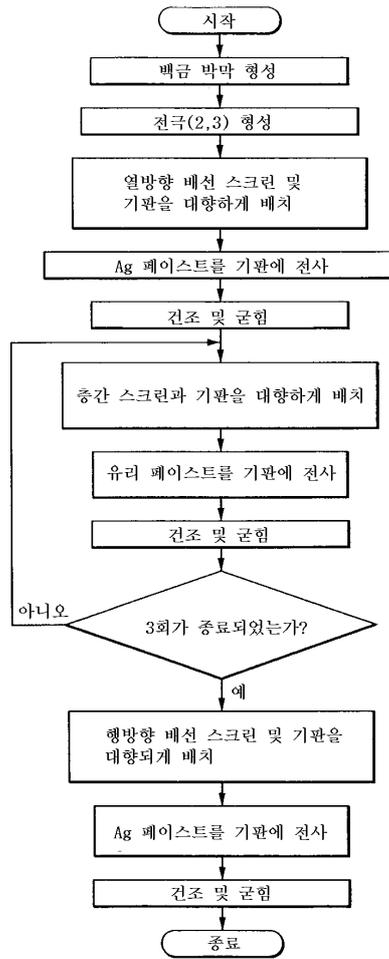
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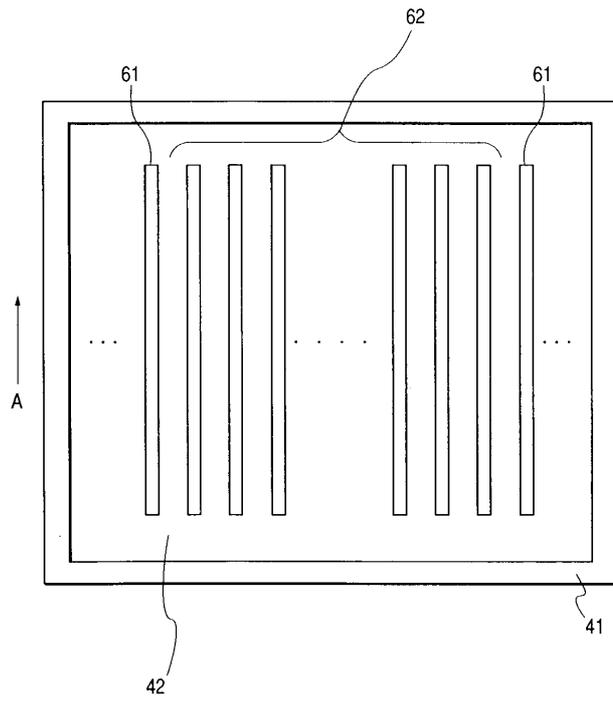
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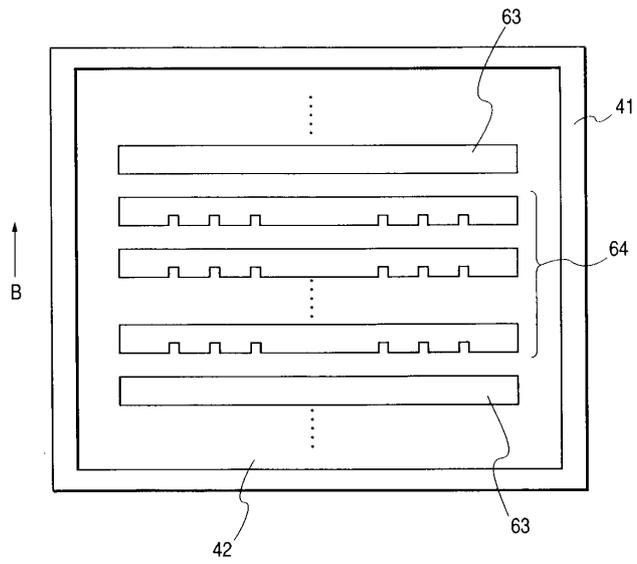
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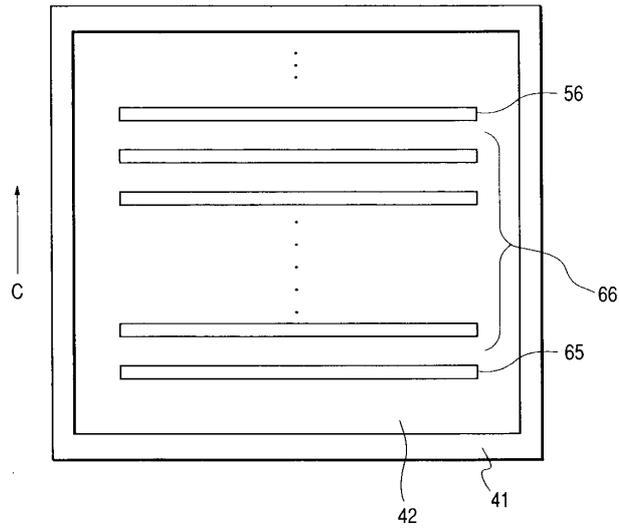
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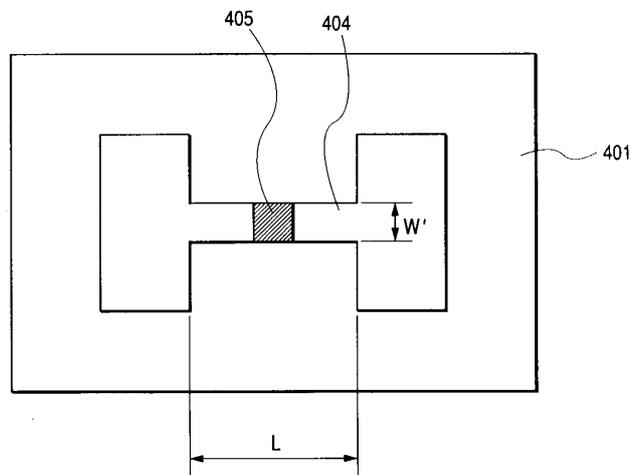
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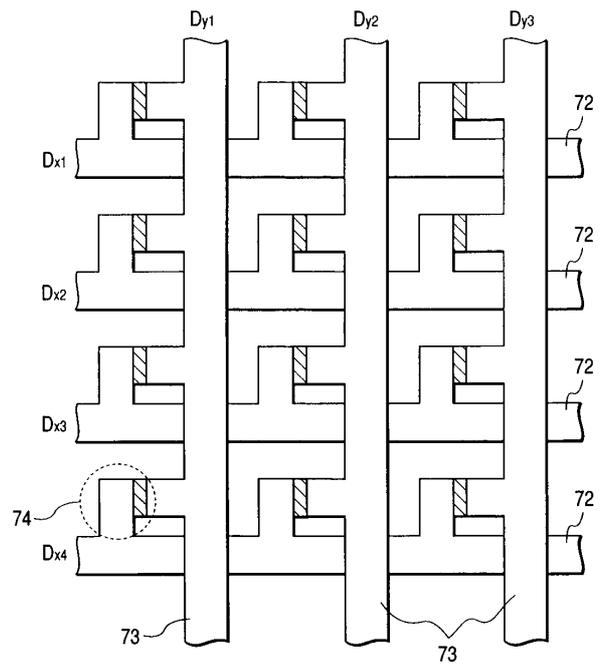
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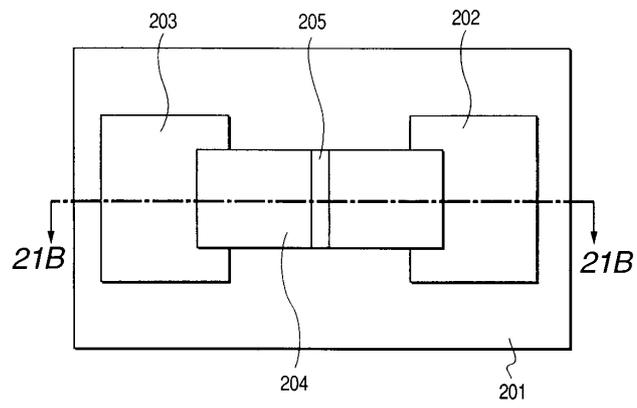
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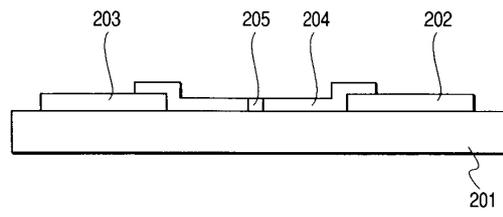
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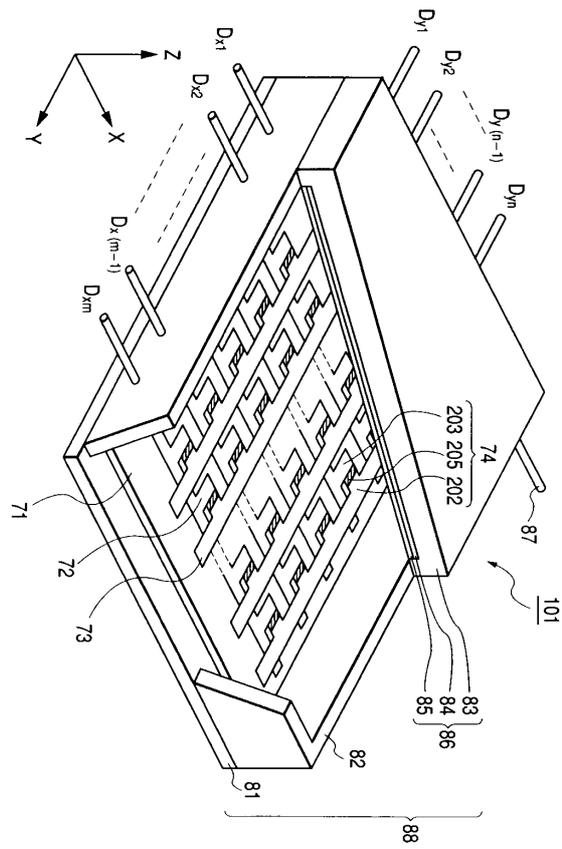
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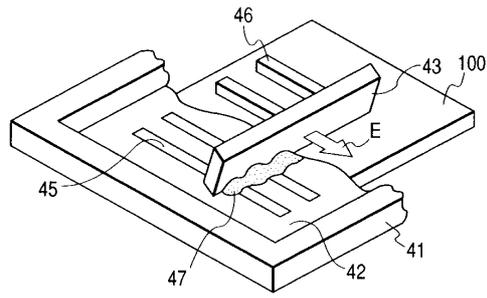
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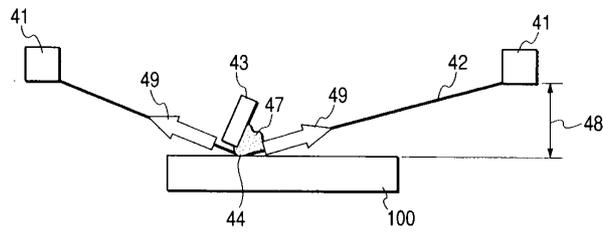
22



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