

(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 . (X1) (row - directional wire) (X0) 가 (column - directiona  
(Y1) (Y0) 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  $\text{SnO}_2$  [M. Hartwell & C. G. Fonstad, IEEE Trans. ED Conf., 519 (1975)],  $\text{In}_2\text{O}_3/\text{SnO}_2$  ["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)  
 (Rs)  
 $R = R_s(l/w)$  100 5000 (t), (w) (l)  
 Rs가 (t) ( ) ,  $R_s = /t$

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) (74), (72)  
 (73) (multi electron beam source)  
 (72, 73) (72, 73)

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

Dxl Dxm Dyl Dyn ( )  
 Dxl Dxm , Dyl Dyn

(81)  $1.33 \times 10^{-4}$  Pa (86)

(86) (81) 가 (71) (86) (Dxl

Dxm, Dyl Dyn) (72, 73) 가

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) (squeeze

(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  
 (401) , (401)  
 가 (402) 가 .

가 .  
 (1)

가 .

(2) 가 , .

(3) 가 ( , ) . (1) (2) 가 .

(4) 가 .

가 가 , 2 가 가 가 .

가 .

1 1 , 1 1  
 1 1 1 가 , 1 1 가  
 , 1 / .  
 가 1 가 .  
 2 2 1 2  
 가 1 가 , 가 .  
 2 가 1 2 가 ,  
 1 2 . , 2  
 가 , 1 2 1 2  
 2 2 2 2 , 2  
 2 가 . 가 1 2 2 가 2 .  
 2 가 , 2 가 2  
 1 2 2 2 ,  
 2 2 2 , 1 2 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 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') (9) (5', 6') (5',

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

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

(Ag) (1)

(1) 가 (6)

(6')

2c (7) (7) SiO<sub>2</sub> PbO (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) Y0	Yn	.	Tox0	Toy0	.	(5')	X0	(
			(17)	(15)				

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

(5')	가	(5)	Tox0	Toy0	(6')	가	(6)
(9)			가	(17)	(15)	가	
(15)			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 $\mu$ m

(1) (Cr) (Au)  
(AZ 1370, Hoechst Aktiengesellschaft )  
(5; ) (5')

5nm 600nm

(1)

(5)

(5')

6a

B

(7) 6b (21) (7) RF 1.0 $\mu$ m

C

6c (21) (21) 가  
(7) (21)  
가 CF<sub>4</sub> H<sub>2</sub>

D

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

$5 \times 10^4$

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  
 (H<sub>2</sub>) (N<sub>2</sub>) 가  
 (5) 가

I  
 ,  
 1.3 × 10<sup>-4</sup> 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)	$\sigma_{y1}$	Ie (X1)	$\sigma_{x1}$
제1 실시예	1.8 $\mu$ A	0.1 $\mu$ A	1.8 $\mu$ A	0.1 $\mu$ A
제1 (비교예) 실시예	2.1 $\mu$ A	0.4 $\mu$ A	2.0 $\mu$ A	0.5 $\mu$ A

1 (9) , Y1 (6) 80 가 1.8  $\mu$  A  
 (le) 0.1  $\mu$  A y1 , X1 (5) 120 가 1.8  $\mu$  A  
 (le) 0.1  $\mu$  A x1 . 1  
 , Y1 (6) 2.1  $\mu$  A (le) 0.4  $\mu$  A y1  
 , X1 (5) 2.0  $\mu$  A (le) 0.5  $\mu$  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  $\mu\text{m}$   $\times$  200  $\mu\text{m}$  (2, 3) (2) [ (2') ] (3) 3

$\mu\text{m}$  (3) 20  $\mu\text{m}$  . Y0 (6') 500  $\mu\text{m}$   $\times$  150  $\mu\text{m}$  (6') (3') 0.3

(3) . Y0 (6') (6) Y3 (3') 7a (6)

(6')

가 (3', 3)

7b (6) (6')가

(Ag) . Ag

110 20 , 550 가 15

12  $\mu\text{m}$  (6) (6') 100  $\mu\text{m}$

7c (7)

PbO 110 20

550 가 15 , 500  $\mu\text{m}$  30  $\mu\text{m}$

(7)

7d (5) (5) (5') (6) (5')가 (6') (7)

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) (gettering)

(getter)가 (18) , RF 가

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

9 (14) (52) (51)  
 , 1 (energization forming operation) 가  
 (9) (18)가 (18)  $1.33 \times 10^{-4}$  Pa  
 가 가 가 가  
 1 msec , 10 msec 10 V  
 60  
 , 1 (18) 가 , (18)  
 가 (18) 가 가  
 가 RF 가 가 Ba . Ba가  
 가 (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) 1  
 가 25  $\mu$ s 60 Hz 가 가  
 2 3  
 (black stripe) 1/5

	Ie(Y1)	$\sigma_{v1}$	Ie(X1)	$\sigma_{x1}$
제2 실시예	1.7 $\mu$ A	0.1 $\mu$ A	1.7 $\mu$ A	0.1 $\mu$ A
제3 실시예	1.6 $\mu$ A	0.1 $\mu$ A	1.6 $\mu$ A	0.1 $\mu$ A
제2 비교 실시예	1.9 $\mu$ A	0.35 $\mu$ A	2.0 $\mu$ A	0.4 $\mu$ A

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

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)	$\sigma_{v1}$	Ie(X1)	$\sigma_{x1}$
제4 실시예	1.7 $\mu$ A	0.1 $\mu$ A	1.7 $\mu$ A	0.1 $\mu$ A
제5 실시예	1.7 $\mu$ A	0.1 $\mu$ A	1.8 $\mu$ A	0.11 $\mu$ A

	휘도(Y1)	$\sigma_{v1}$	휘도(X1)	$\sigma_{x1}$
제4 실시예	4000 cd/m <sup>2</sup>	150 cd/m <sup>2</sup>	4100 cd/m <sup>2</sup>	160 cd/m <sup>2</sup>
제5 실시예	4100 cd/m <sup>2</sup>	160 cd/m <sup>2</sup>	4300 cd/m <sup>2</sup>	200 cd/m <sup>2</sup>

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)

480 X 1920

(2, 3) 20 μm , 0.9 mm ,

0.3 mm (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)





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

,

1

,

1

,

1

,

1

1

23.

1

1

,

1

,

1

,

1

,

1

1

1

24.

1 , 21

23

,

가

25.

,

,

,

,

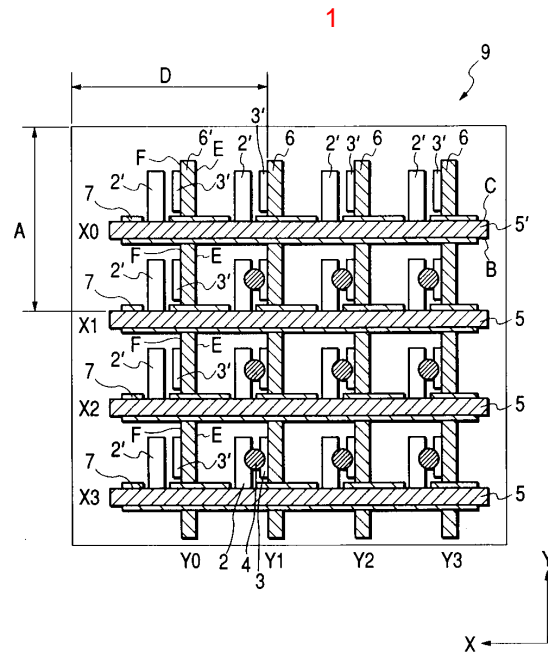
26.

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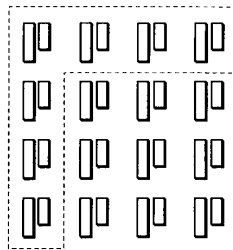
,

,

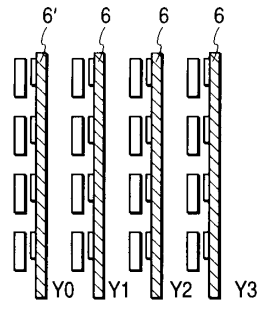
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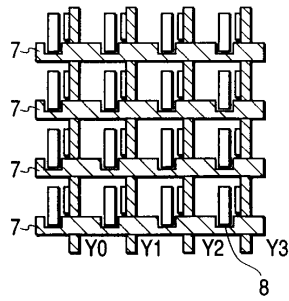
2a



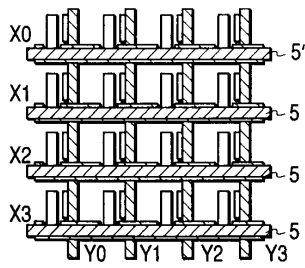
2b



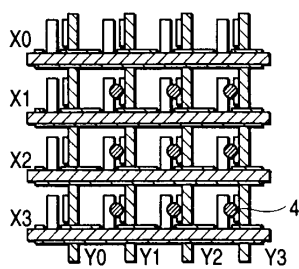
2c



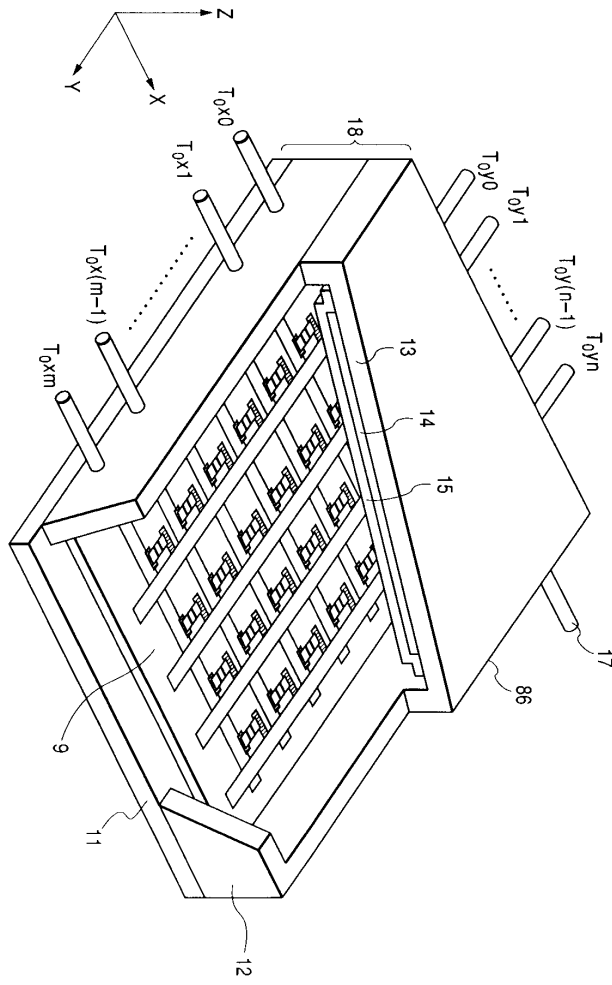
2d



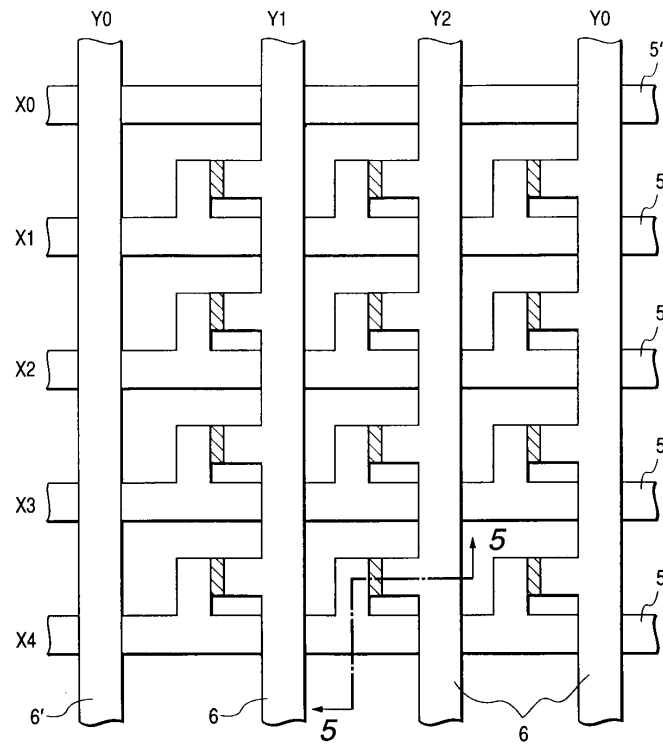
2e



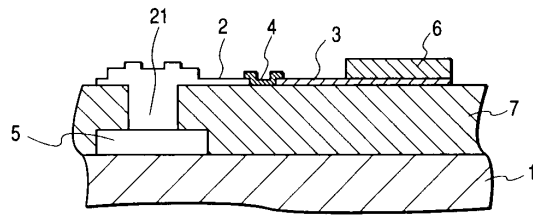
3



4



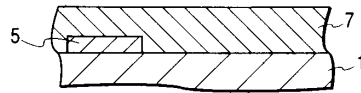
5



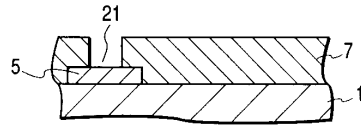
6a



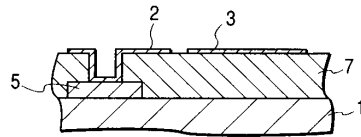
6b



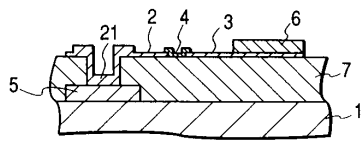
6c



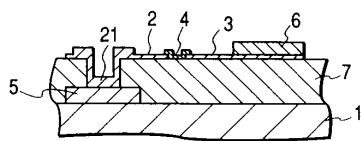
6d



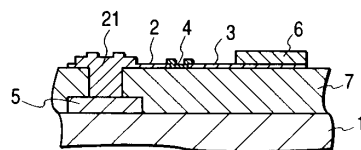
6e



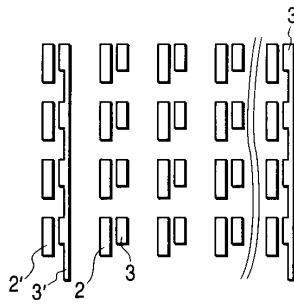
6f



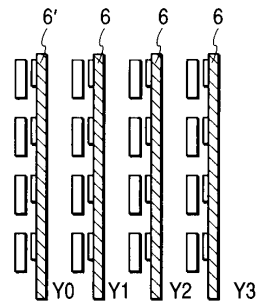
6g



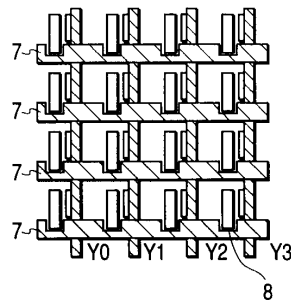
7a



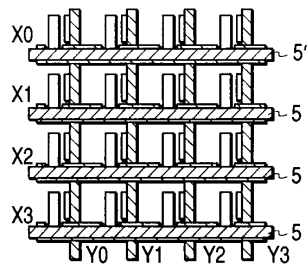
7b



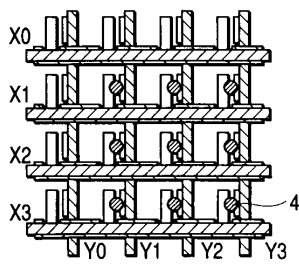
7c



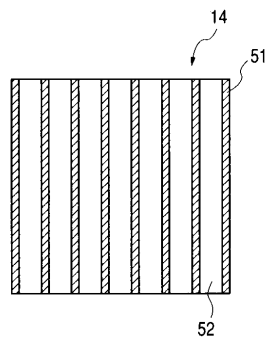
7d



7e

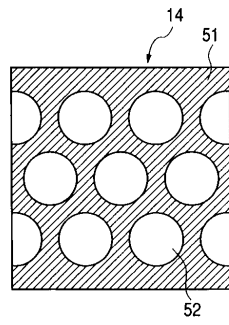


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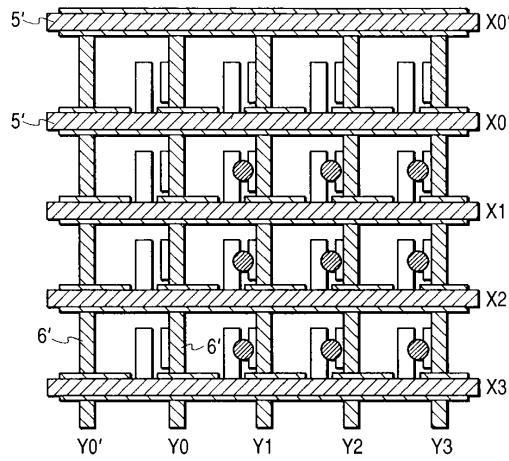




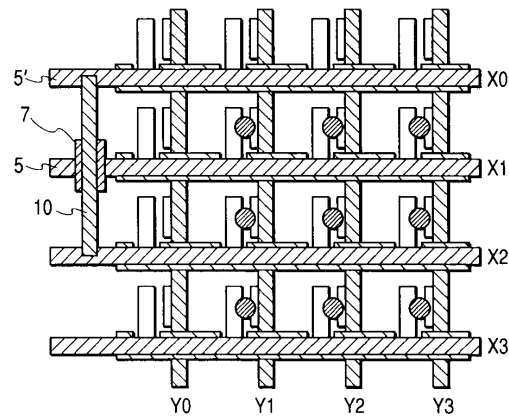
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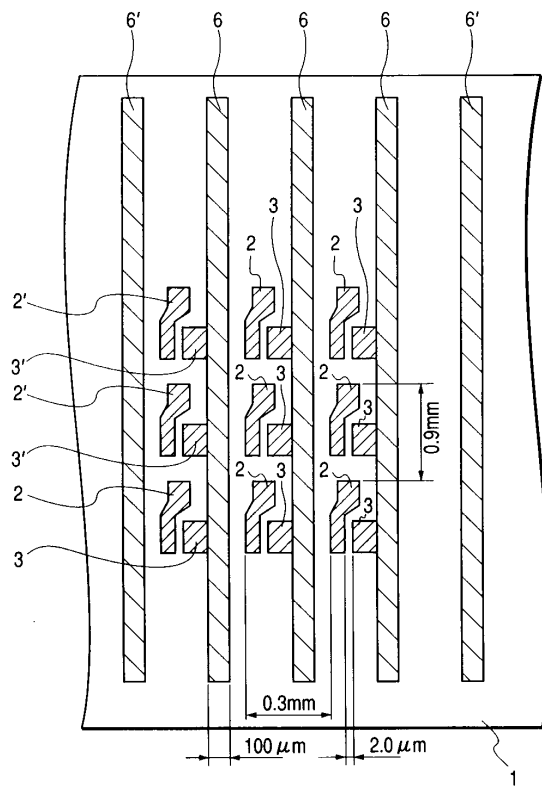
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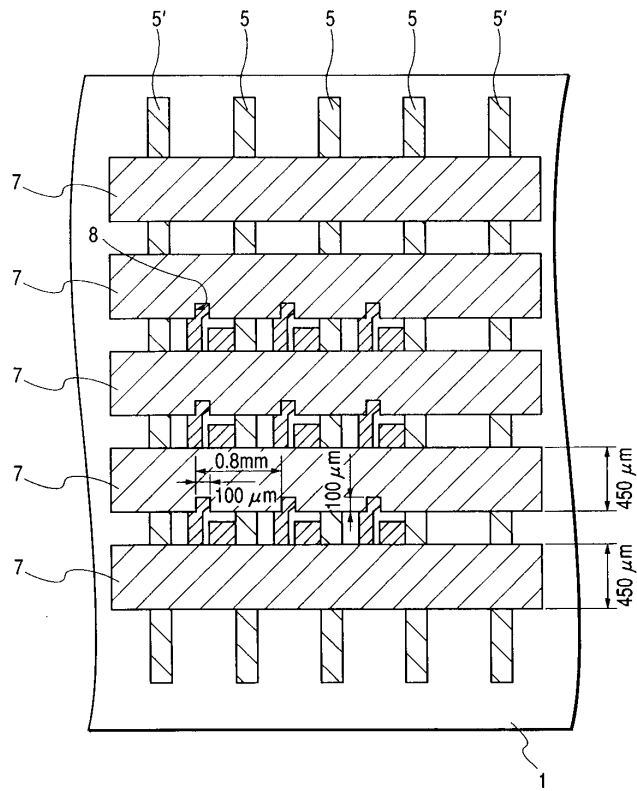
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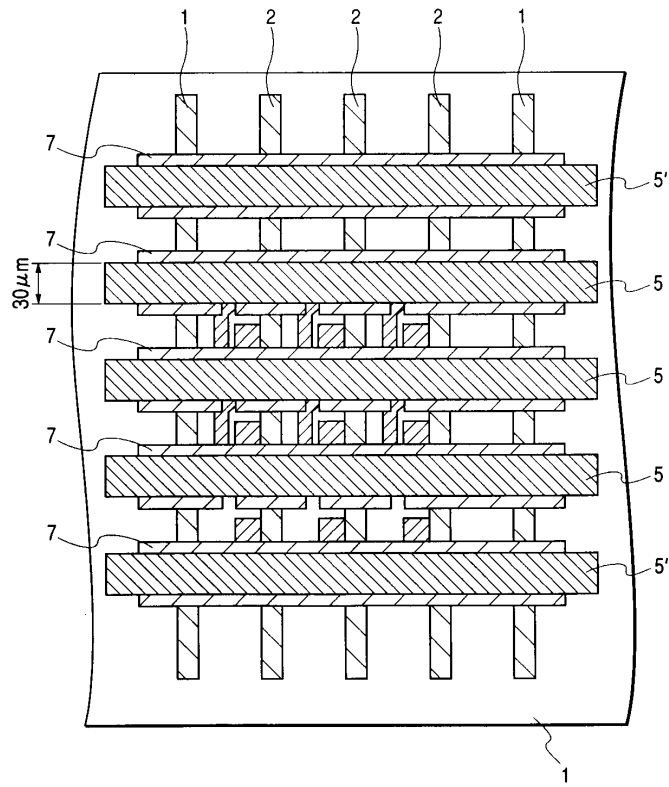
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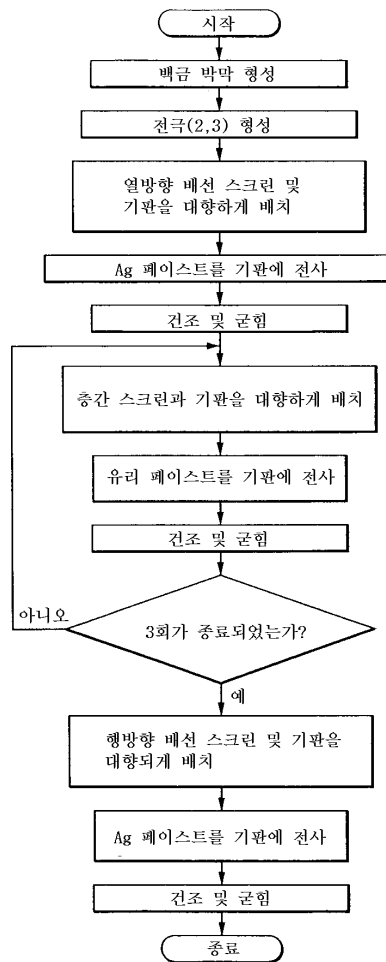
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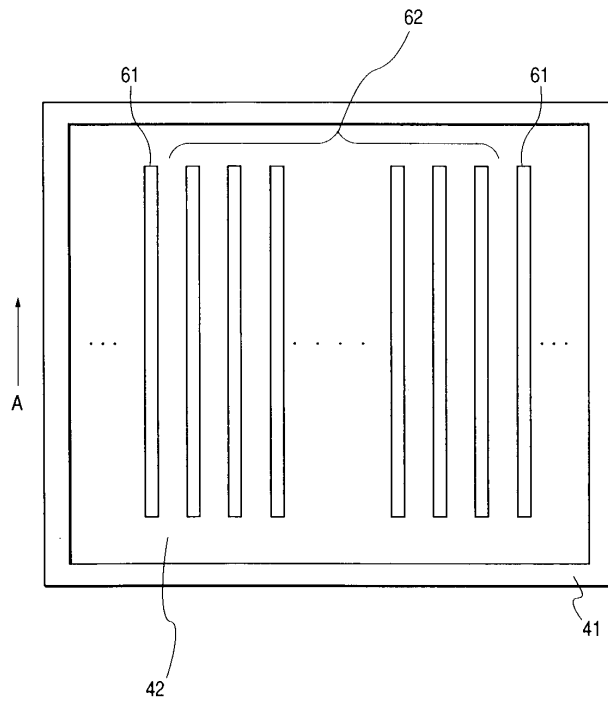
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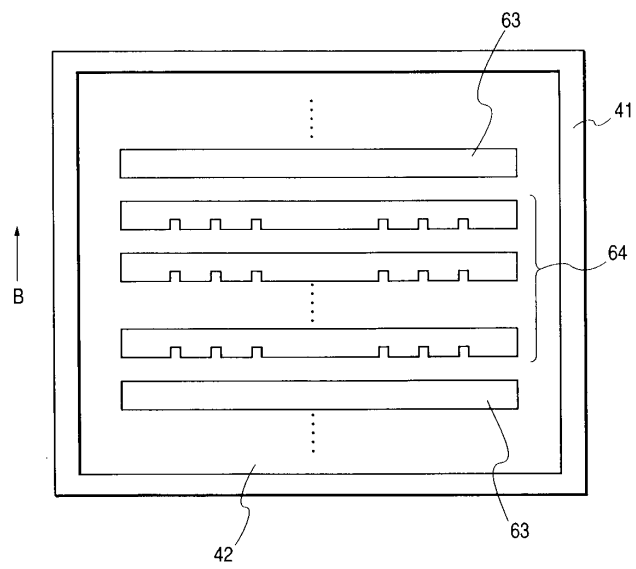
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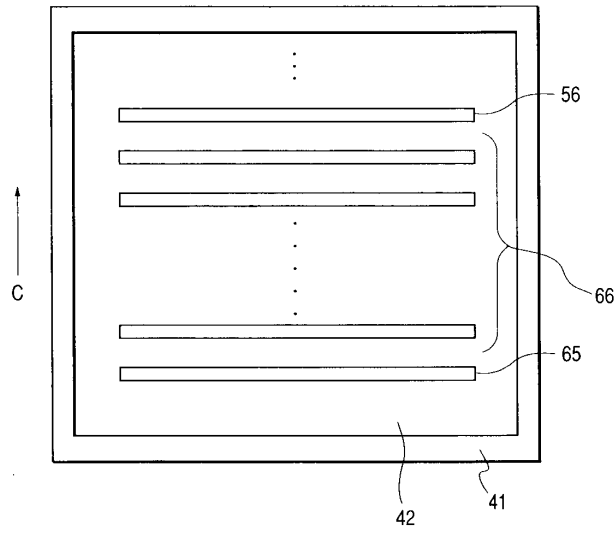
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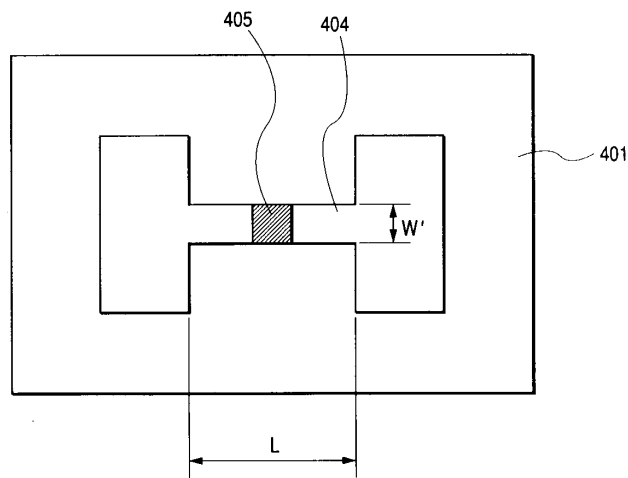
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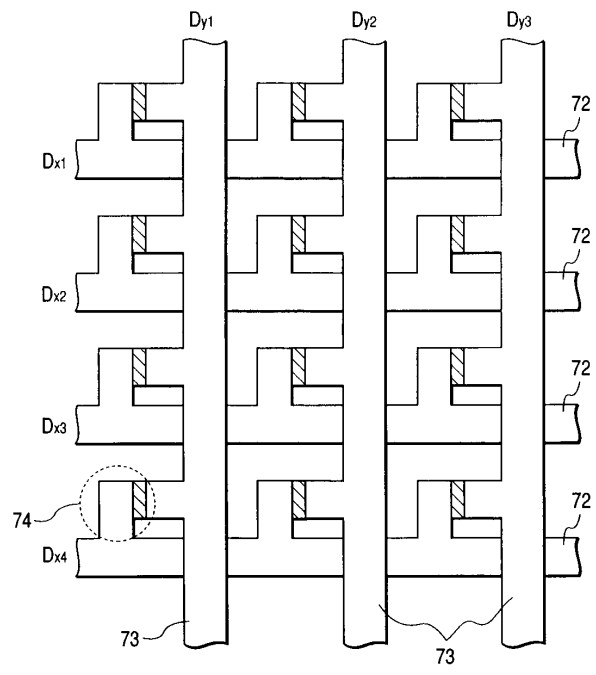
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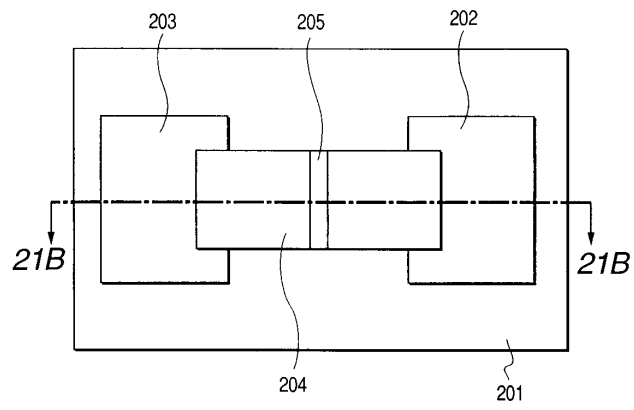
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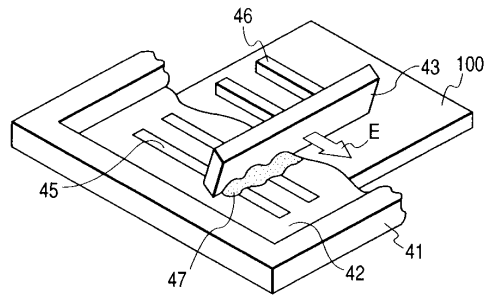
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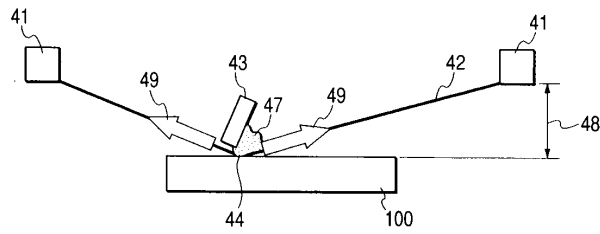




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