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(22) 2004 06 09

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 JP-P-2003-00173628 2003 06 18 (JP)  
 JP-P-2003-00173629 2003 06 18 (JP)  
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 JP-P-2003-00209599 2003 08 29 (JP)

(71) 가 가 가 가 292

(72) 가 가 가 292 가 가

가 가 가 292 가 가

가 가 가 292 가 가

가 가 가 292 가 가

가 가 가 가 292 가 가

가 가 가 가 292 가 가

가 가 가 292 가 가

가 가 가 292 가 가

가 가 가 292 가 가

(74)

:

(54)

(105, 108) , (301) , (303) 가 . , (3  
 05) 가 , , 가 (001) , (001) .

16e

- 1 , .
- 2 , .
- 3(a) (d) , SLS .
- 4(a) (d) , .
- 5 , , (a) (SEM)  
 , (b) (EBSP) , (c) (b)
- 6 , , (a) 1 ,  
 (c) (b) , (b) 2 ,
- 7(a) , 1 , (b) 2 2
- 8 , (a) 1 2  
 , (b) 2 2
- 9(a) , 가 가 , (b) 가
- 10(a) (d) , 1 .
- 11(a) (d) , 2 .

12(a) (c) , 3 6

13(a) (b) , 7 8

14(a) , (b) ,  
(c) (d) , 가 ,  
(e) .

15 , 가

16(a) (e) , 9

17(a) (b) , 10

가

가 ( ) , 가

SOI(Silicon On Insulator)

LSI(Ultra large - Scale

Integrated circuit)

가 (100)

가

(001) ,  
SIMOX

가

ULSI

가

가

1980

가

가 (001) 가

가

1  
1986/9 vol. J69-C, No.9 p.1089 - 1095.'

(11) (常壓)

Si

(14a)  
가 (17)

(11)

(14)  
1412  
(13)

가 , 가 (17)  
가 (17)

(15)

1 가 (13)가

(14) (14)  
(14) 12  
(14a) ( )

L) (W) 가 , 가 (12) , 가 가 . L W  
 , , 가 100 , , 600 , 15  
 0 ) . ( 가 , ( ) )  
 , , 2 , 가 (21) (22) ( (23) (26)  
 150mm×200μm) (24) (27) , (25) ,  
 10μm (28) , 20ns , 50 100ns  
 , 0.1 1μm (29) ,  
 1 가 (001) (111) 가 , D. P. Gosain, A.  
 Machida, T. Fujino, Y. Hitsuda, K. Nakano and J. Sato, 'Formation of (100)-Textured Si Film Using an Excimer Laser on a Glass Substrate', Jpn. J. Appl. Phys. Vol. 42(2003) p.L135-L.137.,  
 H.Kuriyama, et al., 'Enlargement of Poly-Si Film Grain Size by Excimer Laser Annealing and Its Application to High-Performance Poly-Si Thin Film Transistor' Jpn. J. Appl. Phys. Vol. 30(1991) p.3700-3703

SLS (Sequential Lateral Solidification)  
 3204986 가 ( 1) , 3(a)  
 (細隙) (32) (33) (34) (36) ( 3(b)). (37)  
 2 (36) ( 2(c)). (32) 2(d)  
 (39) ,  
 4(a) (41) (42)( 가  
 ) 4(b) 43 (44) 1 4(c)  
 (45) ,  
 SLS (43) , 4(d)  
 가 가 (47) 가 , (46a,  
 46b) ,  
 Vol.21, No.5, pp.278-287, 2000'

1 가 (1410)  
 ) (001) 가 , ( ) 가 ,  
 , , ) 가 , 가 , ( ,  
 , , 가 , 가 , 가 , 가 ,  
 1 2 , , 가 , 가 1 mx 1 m  
 (001) , 200 ((111) 10 ) (001)  
 , , (001) , ,  
 3 SLS 가 , 가 가  
 가 , , 가 가  
 4 , , 가  
 , , ,  
 , , 가 가 (001) , 가 ,  
 , , ,  
 가 , 가 (100) ,  
 가 1 , , 가 (100)  
 , , 가 ,  
 2 가 ,  
 가 ,  
 , , 가 1 1 2 ,  
 , , 1 1 2 ,  
 2 , , ,



2

(81)

(82)

82a  
가

2

83a

8(b)

2

9(a)  
(93)  
(95),  
)

( )

(orientation flat)(91), (92),  
(94),

9(b)

(96)

가

1

9(a)  
( 10  
10

101

)

(91),

(92),

(93)

가

가

5, 6, 7, 8, 9, 10

가

(101)(

, Si, Ge, Si<sub>1-x</sub>Ge<sub>x</sub>, Si<sub>1-x-y</sub>Ge<sub>x</sub>C<sub>y</sub>, GaAs, GaP, InAs, GaN, ZnTe, CdSe  
(101) (102)( 500nm)

(102)

CVD(

SiO<sub>2</sub>

(102)

SiN

SiO<sub>2</sub>

(102)

(101)

(101)

(102)

30 200nm

Si, Si<sub>1-x</sub>Ge<sub>x</sub>,

Si<sub>1-x-y</sub>Ge<sub>x</sub>C<sub>y</sub>)

CVD( (10

(102)

(102)

10(a)

)

300nm

(103)

(104)(

(102)

, SiO<sub>2</sub>, SiON, SiN

(103)

10(b)

가

(105)

(104)

8(a)

3

1

가

1

가

3

가

(106 106a)

180°

)(106 / 106a)

(101)

(106)

가

(101)

가

1

(J1)

(J1, J2)

5(a)

(103)

(J2)

1

(105)

1

(103)

(107) , (107) (106, 106a) ,  
 가 , (106, 106a) ,  
 가 (52a) (53a) , (54a) , 5(c) , 가 ,  
 (54a) (106, 106a) (100) , (54a) (54a) (54a)  
 2 $\mu$ m (111) (110) 5 $\mu$ m (52a), (53a)  
 , 10(c) 2 (108) 2  
 1/2 가 2 (10(b) (c) , 1  
 , (61b) 2 가 1 6(a) (61a) 1  
 (62a) 가 가 8(a) (81)  
 2  
 7(a) , 1 1/2P(5 $\mu$ m)  
 71 1 가 , 72  
 , 5(b) 2 (75), (73), (74a)  
 2 , 1 가 가  
 2 1 , 5 $\mu$ m  
 1/2P  
 2 , (107) 10(d) (109) (107) 10(d) (1  
 09) , 2 가 , 7(b) 72 , 10(d)  
 (109) (72) (74b) (74b) (  
 (106, 106a) (100) , (109) ) ,  
 7(b) 7(a) (74a) , 2 ,  
 가 (75), (73) (74a) ,  
 (111) (72) (106)( 106a) ,  
 106a) (110) 가 (75) (73) (73) , (106)(  
 (100) (100) (109) (1  
 01) , (100) , (100) 가 , (103)  
 , (103)  
 2  
 가 , 가 ,  
 9, 11 ,  
 , 9((b) (94), (95) (96)( ) 가  
 (111)( , (borosilicate glass),  
 , 500nm) , (111) (112)(  
 ) CVD( 11(a)).  
 (異種) SiO<sub>2</sub> , (112) (112) SiN SiO<sub>2</sub>  
 , (112) (111)  
 , (111)

Ge, Si<sub>1-x</sub>Ge<sub>x</sub>, Si<sub>1-x-y</sub>Ge<sub>x</sub>C<sub>y</sub>) CVD (112) (113)( 30 20nm Si,  
 ) (113) (112)  
 (112)  
 11(a) (113) (14)( , SiO<sub>2</sub>, SiON, SiN  
 ) 300nm (112) (113)  
 1 1  
 11(b) (114) 가 1 (115)  
 1 (116, 116a) (1  
 11) 가 1 (113) (116, 116a)  
 (117)  
 11(c) 1 1/2P 2  
 (118) 2 (109) 11(d) (117) (117)  
 ) (111) (100) 가 (100)  
 3  
 (121)( , XeCl, KrF, ArFf ) 12, 13, 14, 15  
 12(a) (122a) (121) (122)  
 ( 5(a) (j1), (j2)) (123)  
 (124) (124)가 (124) 120a  
 (120a) (125)가 (125)  
 (120b)( ) 1 (126a)가, ( ) 2  
 (127a)가 (127a) (126a) 8(a)  
 (81) 2 가 2 (127a) 8(a)  
 8(a) (81) (81) (62a) 가 가  
 2a) 1 (126a) (81) 2 (127a)  
 1 2 (126a, 127a) , 2 가 (goniometer)  
 (DM)가  
 29) X Y (127a) 가 , (128) 2 (129) (128)가 (1  
 (127a)  
 (121) (122a) (123) 가  
 (124) 가, 가 (122b) (125) (125) (12  
 2b) (122b) (128) 90 (125) (122d) (128)  
 1 2 (126a, 127a) 14 , (128)  
 (126a, 127a)

10 11 (113) 가 .

2 (127a) ( ) , 8(a)  
(81) , 1

, 8(b) .

, (123) (122d) (128) (122d)  
(128) 가 가 , (122d)  
) 가 .

1 2 (126a, 127a) , 14(a) (b) 141 142 ,  
(141a(142a)) 가 가 (141b(142b))  
가 ( ) ( t)가 ( )  
180° 가 ( ) , =2 t(n-1)/ , n  
248nm KrF ( ) ( t)가 244nm  
(141(126a), 142(127a)) , 12(a)  
(141a(142a)) 가 ,  
(P)( ) (141, 142)

, (141a(142a)) ( , SiN, SiON, Ge ) 가  
(141(142)) 가  
가  
가

15 (151) (異種) ,  
(152a, 152b, 153a, 153b) (152a, 152b 153a, 15  
( , )가 2 (154)  
3b) (152a(153a) 152b(153b)) (1/2 )  
(151) ( ) (152a) , 2  
( ) (152b)  
( ) (153a 153b) 가 ,  
가

1 (141) 2 (142) , 14(c) 4  
(143) , 4 , 4 (塵埃)  
가 , 14(d) , 1 2 ( )  
, 가 , 1 1 2 , 가 , 2  
가 , 1 2 , 가 , 2

1 2 (126a, 127a) ( )  
가(可)

2 (127a)

4 ( )

3 (128) (125) ,  
(123) (120a) (126a) 가 3

5  
 가 , 12(b) (123) (120a) 1 (126a)  
 25) , (125) (128) 2 (127a) (1  
 1 (126a) 4

6  
 가 , 12(c) (123) (120a) 1 (126a)  
 28) , (125) 2 (127a)가 (1  
 가 , (129) 가 가 ,

3 6 , 2 (128) (126a, 127a)  
 (125)) (129) ) (129) (129)  
 , , 7 8  
 , (127c) 1 , 2 (127d) (127c, 127d)  
 (127c) 가, 2 (127d) , 1  
 , (127c, 127d) 2 (127d) 가

7  
 13(a) , 1 (121a) , 1 (123a), 1  
 (124a) , 1 (127c) 1 , 2 (121b) ,  
 2 가 (123b) , 2 (124b) 2 (127d) 2  
 가 (127c) 2 (127d) 가 ,  
 가 (127c, 127d) , 14(c) (d) (127c)  
 2 (127d) 14(b) , 1 (127c)  
 1 (127c) (half-mirror)(135)가 (135)  
 (125) 90° , 2 (127d)  
 가 (125)  
 1/2P( 1/2) (128)

가 , 1 (121a) 2 (121b)가  
 , (135), (136) 1 2 가  
 가 , 가 , 2

8  
 13(b) , (121) (123) (139a)  
 가 (139a) 2  
 (139a) 1 (124a) 1 (127c)  
 (135)가 (139a) 2 (139b, 139c)  
 2 (124b)가 (124b) 2 (127c)  
 7d) (135)가 (135) , 1 (127c)  
 , 2 (127d) (125)



16(e) (311a) (307) (311b)

10

17(a) (b)

(426), (400) (427) TFT(430) ( ) (421, 422), (423), (424), (425),  
 (421, 422) (423) (421, 422) (421, 422)

TFT(430)( (421, 422) (424) , (422) (424) TFT(430)  
 (425) (426) ) ,

(425) (424) (425)  
 (422) (41) ( )

(426) (424) (426)  
 (422) (26) ( )  
 (426) (42) ( )

43) (741) (442) (443) (4  
 (XCT) (Vpix), (YCT)

(427) (421) (421) (424) (424) (427)

(421, 422) (400)  
 (422) (400)

TFT 가

EL

가 가

/ 14 (141, 142)

a-1. 가 가 (001) 가

a-2. , a-1 .

a-3. , a-1 .

a-4. 가, 가  
(001) a-1 a-3 .

a-5. , , 가 (100) , 1 , 가 , 가 (100) , 2 .

a-6. , , 가 (100) , 1 , 가 (100) , 2 .

a-7. , (001) a-5 a-6 가 .

a-8. 가 1 , 가 2 .

a-9. 1 가 , 가 , 2 , 가 a-8 .

a-10. 1 가 (100) , 2 , 가 (100) , 가 a-8 .

a-11. 1 가 2 , a-8 a-10 .

a-12. 1 2 2 ,  
 1 a-11 .

a-13. 1 a-11 2 , .

a-14. 가 a-11 a-13 가 .

a-15. , , , 가 , , 1 2 , 1 , 2 , .

a-16. 1 2 가 , , 1 2 , 1 가 , 2 가 , a-17. , 1 1 , 1 , 2 1 2 , 2 , 가 a-16 .

a-18. , 1 2 1 , 1 2 1 , 2 1 가 a-16 .

a-19. , 가 a-16 a-18 .

a-20. 1 2 가 a-16 a-19 가 .

a-21. 가 1 2 , , 가  
1 2 , 가 가 (001) .

a-22. 가 (001) a-21 .

a-23. a-14 가 1 2 , , 가 , 1 2  
1/2 가 ,

a-24. 1 가 a-23 가 , .

b-1. 가 1 가  
1 2 가

1 가 , .

b-2. 2 , b-1 .

b-3. 1 2 가  
2 b-1 .

b-4. 1 가 , 가 ,  
2 , 가  
가 b-3 .

b-5. 1 가 , 가 (100) ,  
2 , 가 (100) ,  
가 가 b-3 .

b-6. ,  
1 2 1 2

1 가 2 가 , 1 2 ,

b-7.

가

1 2  
b-6

b-8.

b-7

b-9.

가 b-6 b-8

b-10.

1

b-9

b-11.

1

b-9

b-12.

1

b-9

2

b-13.

1

가

b-9

b-14.

1

2

1

2

b-6

b-13

가

b-15.

1

2

가

가

가

가

가

b-14

b-16.

1

2

가

b-15

b-17.

6

1

2

가

b-15

b-1

b-18.

14

1

2

b-17

b-

b-19.

1

1

2

2

b-14

b-17

c-1.

가

가

가

c-2. , c-1  
 .

c-3. 가 (001) ,  
 c-2 .

c-4. , 가 c-3 ,

c-5. c-1 c-4 , 가 가

c-6. , c-1 c-5 .

c-7. , c-5  
 .

c-8. , c-1 c-5 .

c-9. , , c-5 .

c-10. 가 , , 가  
 , 가  
 , 가  
 , 가  
 가

c-11. , c-10 , .

c-12. , c-10 c-11  
 .

c-13. c-10 c-12 가 (001) , .

c-14. , 가 ,  
 c-10 c-13 .

가 (001) ,  
 가

(57)

1.

가 가 (001) 가 ,

1 2. ,

가 가 (001)

3. 가 1 ,  
가 ,  
2 ,

4. 가 1 가 2 1 가 ,  
1 가 2 ,

1 가

4 5. ,  
2 ,

3 6. 5 ,  
1 가 , 가 (100) ,  
2 , 가 가 (100) ,

3 7. 6 ,  
1 가 2 , 1 2

3 8. 5 ,  
1 2 ,

가  
9.  
7 8

가  
10.  
가

가  
11.  
가

가  
1 2  
1 2

12.  
1 2 가  
1 2  
1 가

2 가  
13.  
가

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

11 14. 12 ,  
1 , 1 1 , 1  
1 1 , 2 1 2  
2 2 , 가 2 .

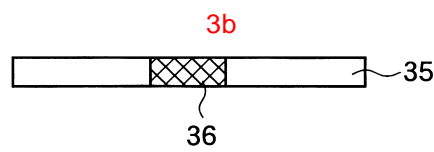
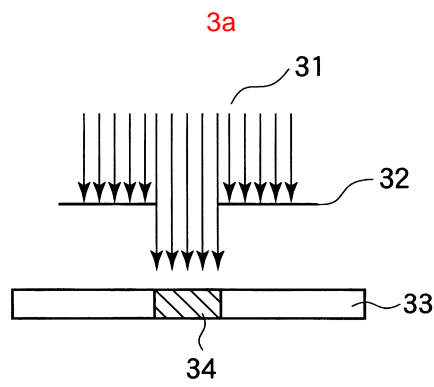
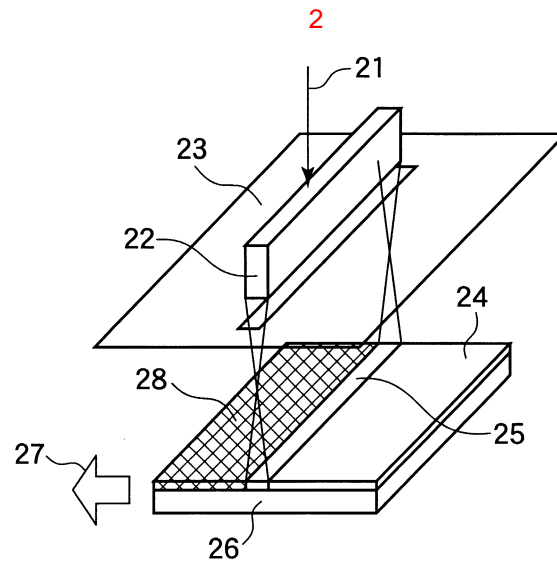
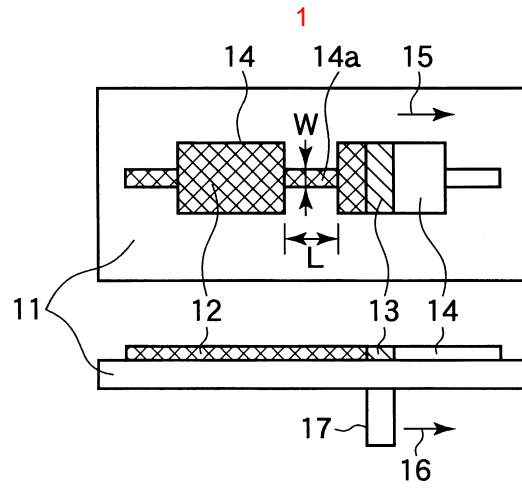
12 15. 13 ,  
1 , 1 2 1  
2 1 , 1 가 2 1  
2 2 가 2 .

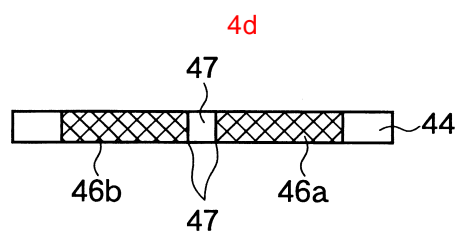
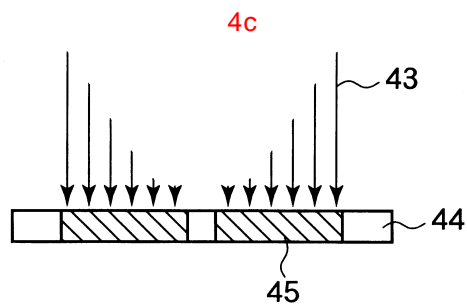
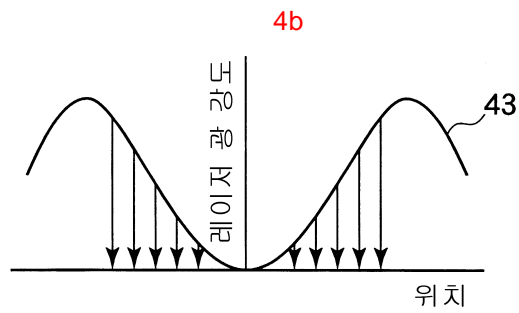
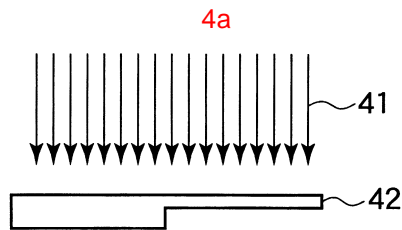
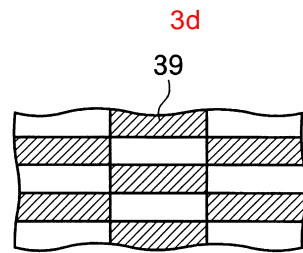
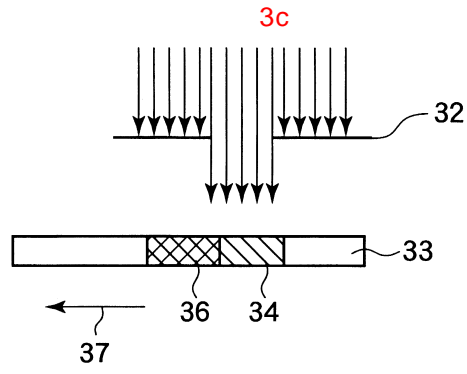
12 16. 14 ,  
1 2 , 가  
가 .

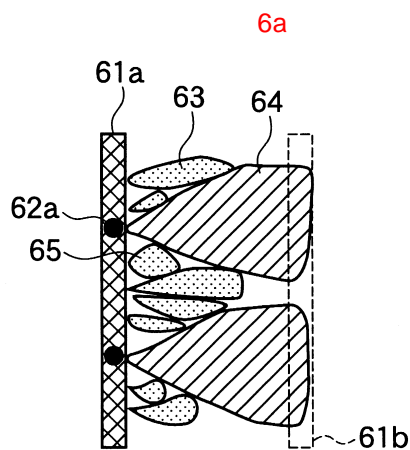
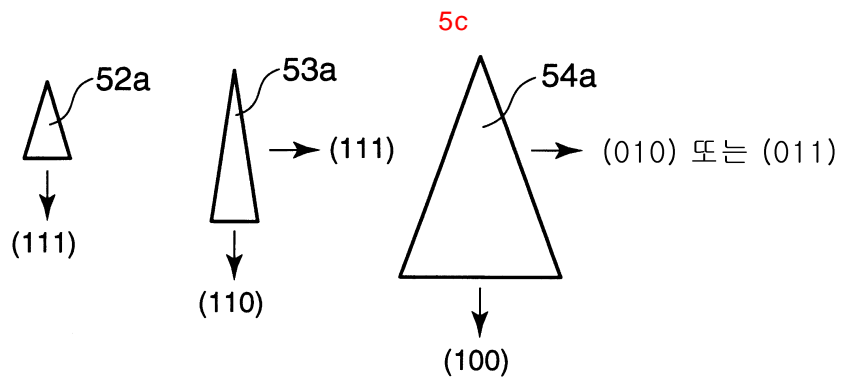
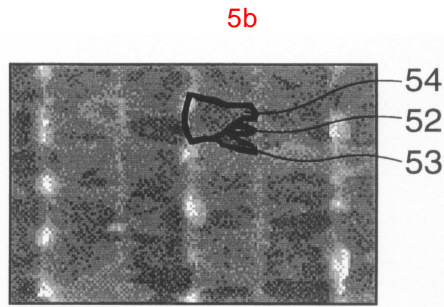
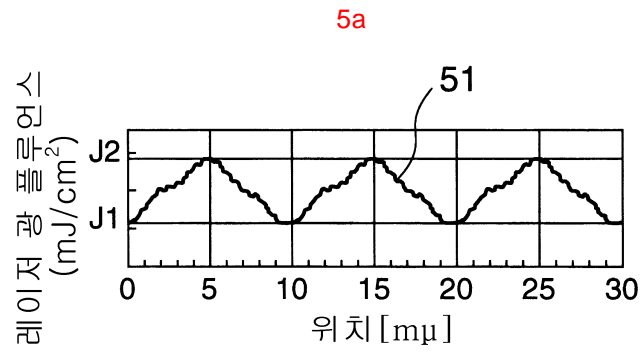
17. 가 1 2 , , 가 ,  
1 2 , 가 가 (001) .  
가 , ,

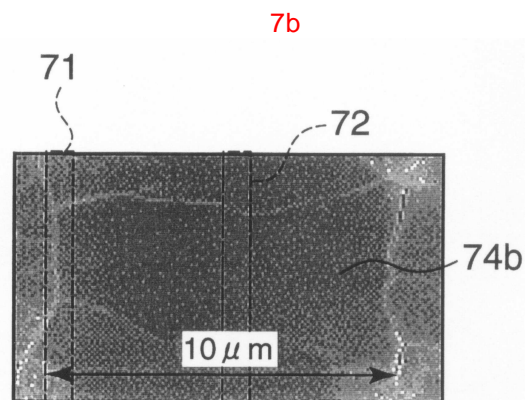
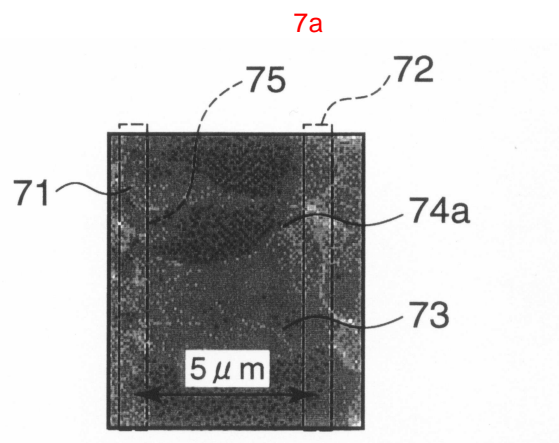
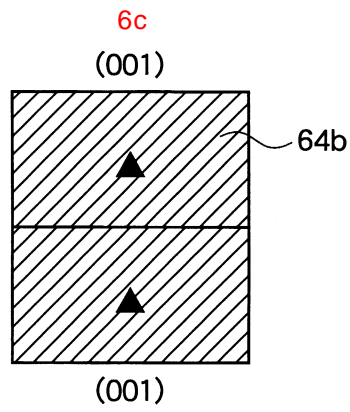
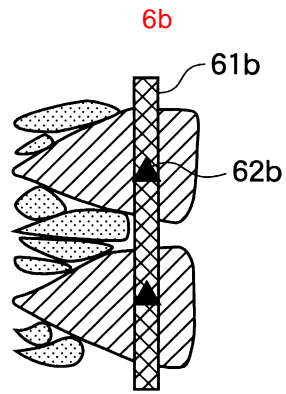
10 18. 15 가 1 2 , 가 , 1  
2 , 1/2 가 ,

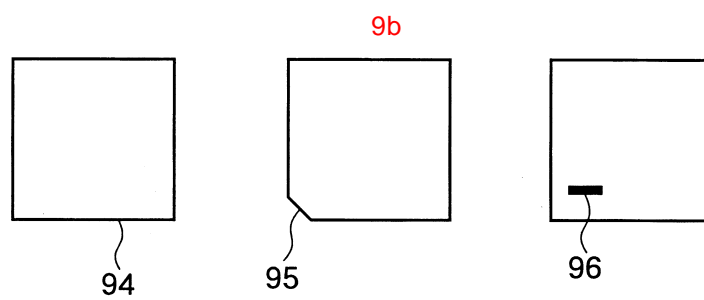
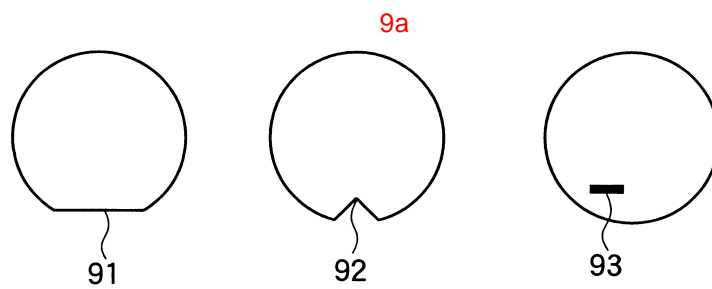
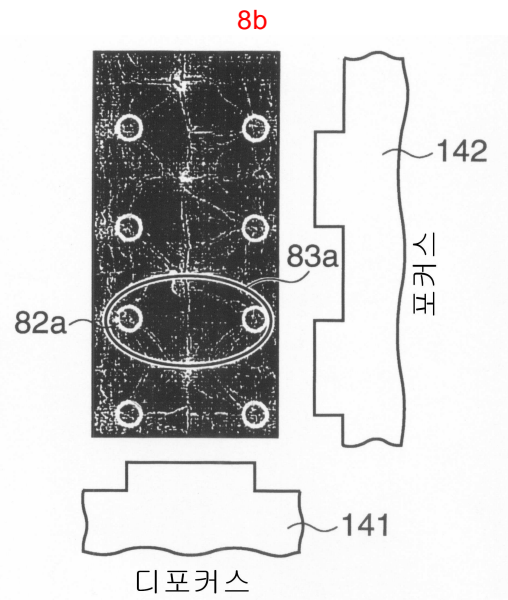
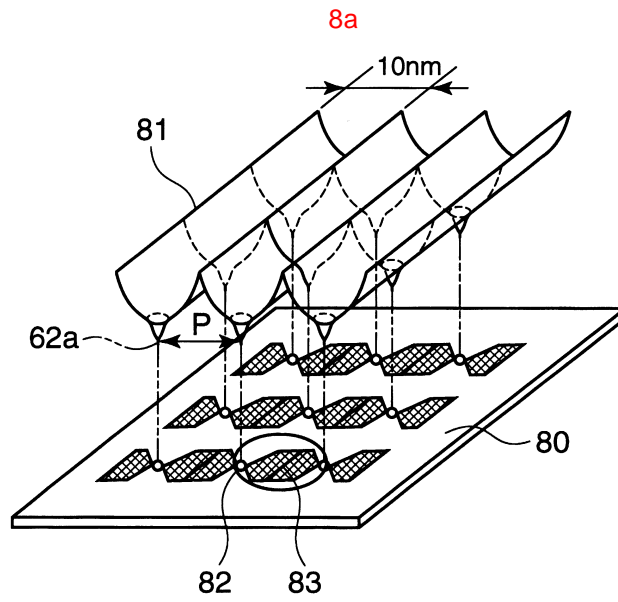
18 19. ,  
1 가 ,



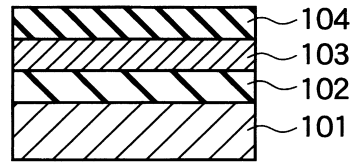




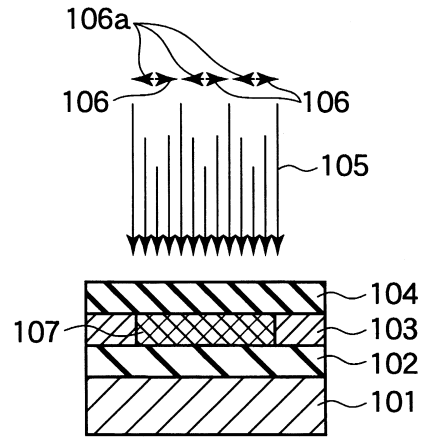




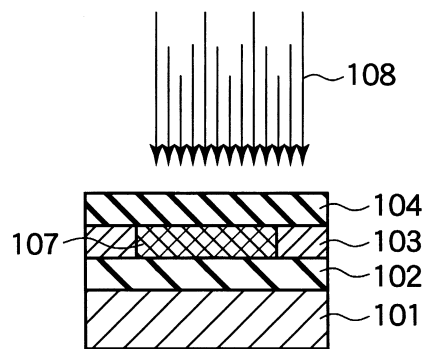
10a



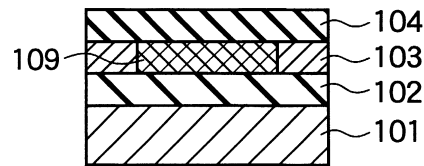
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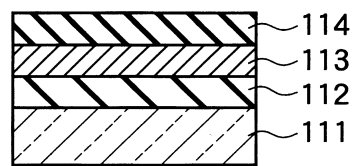
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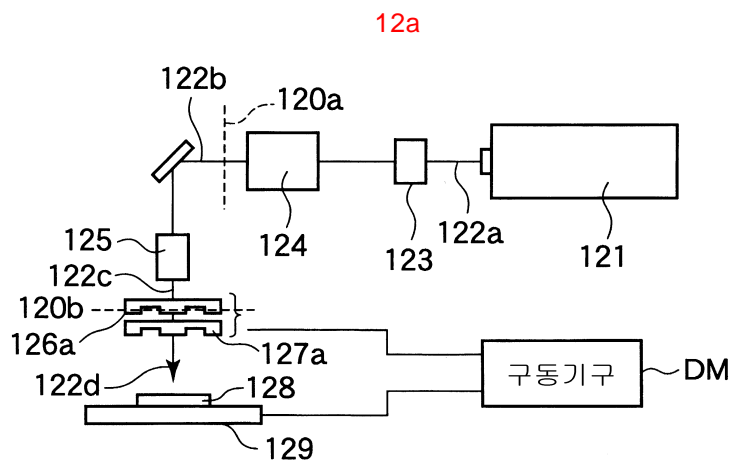
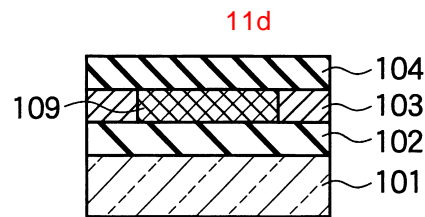
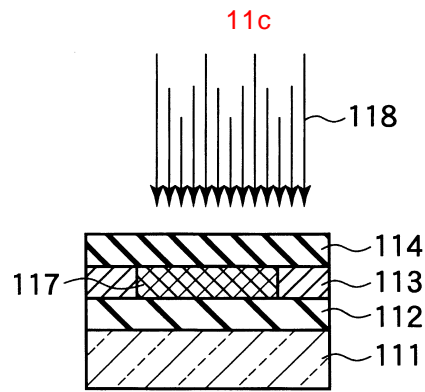
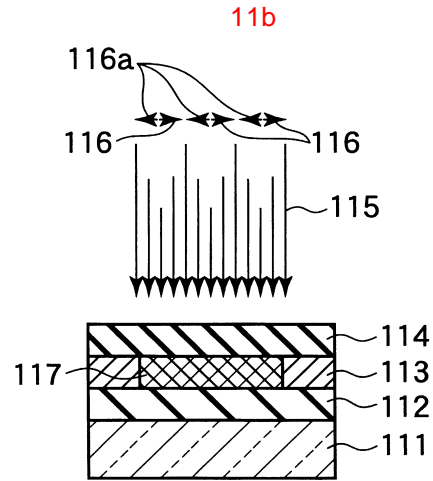


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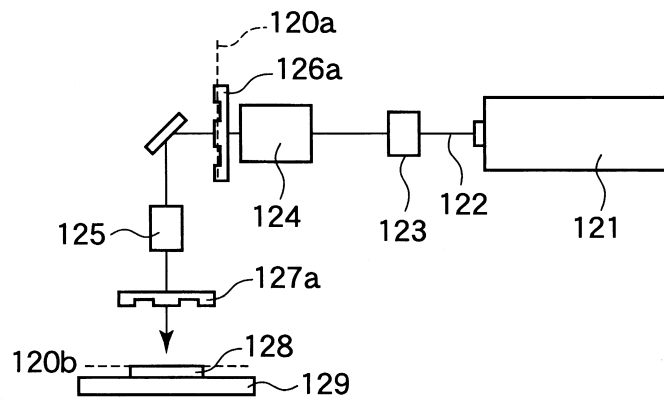


11a

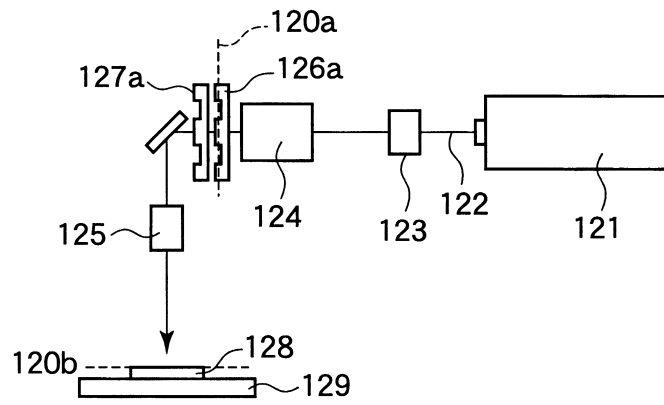




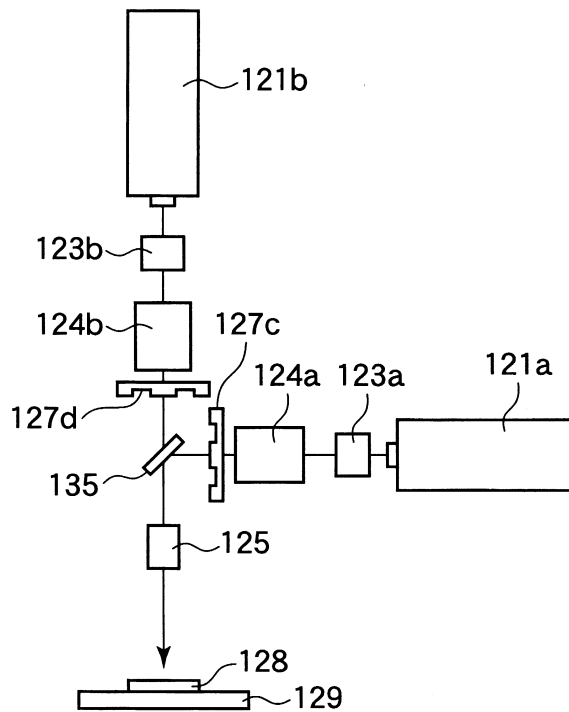
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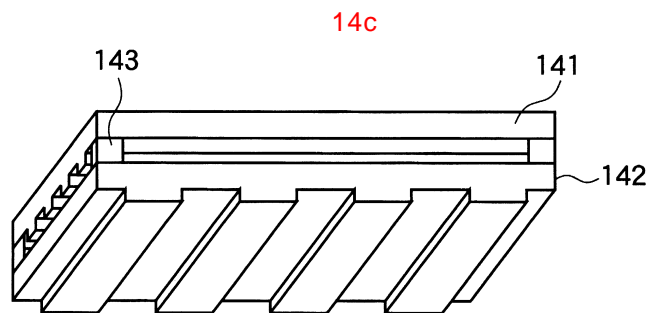
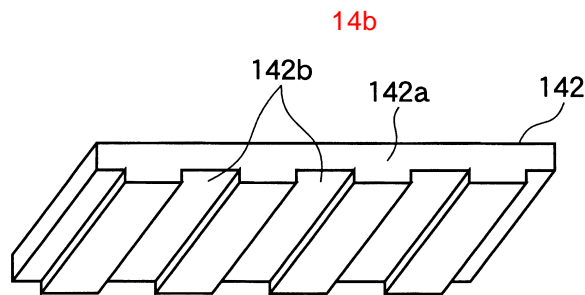
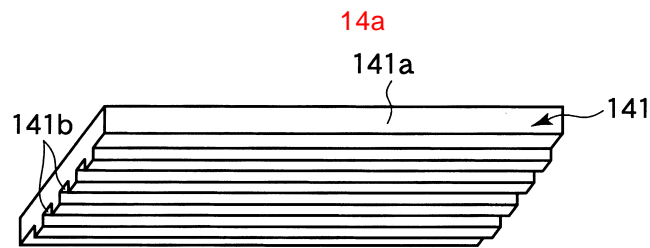
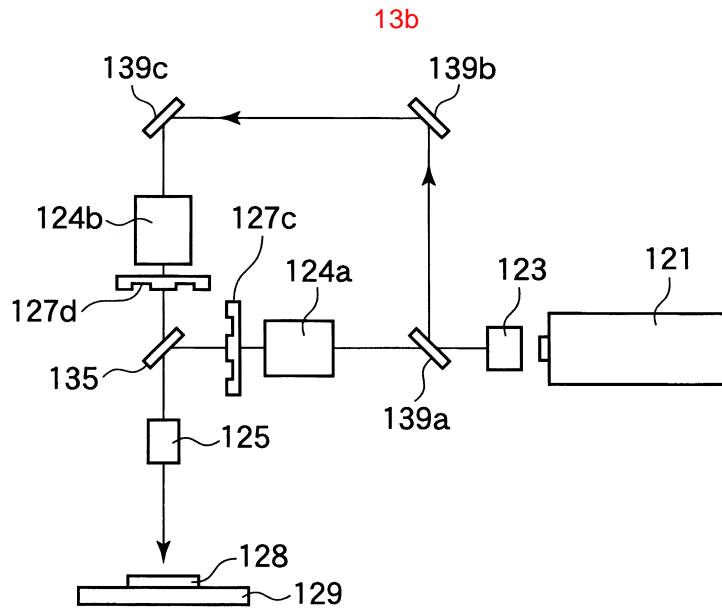


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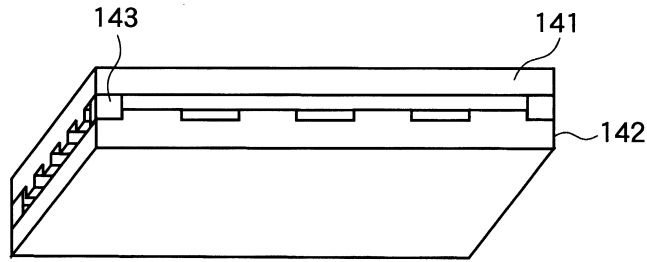


13a

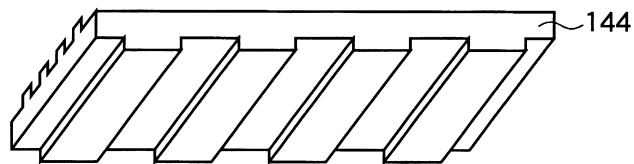




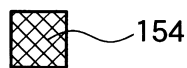
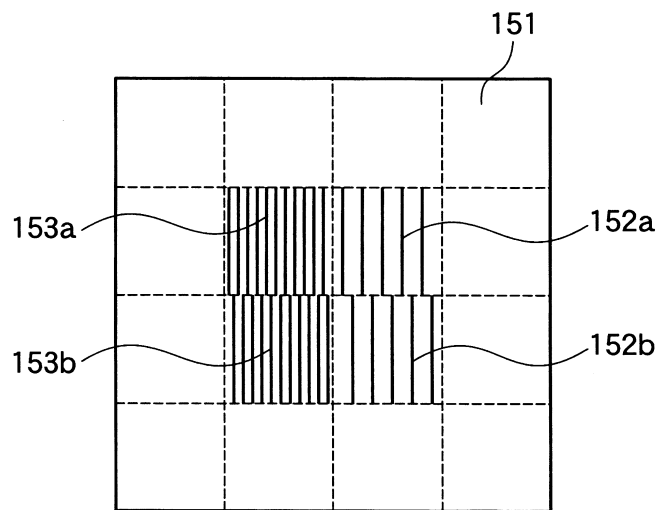
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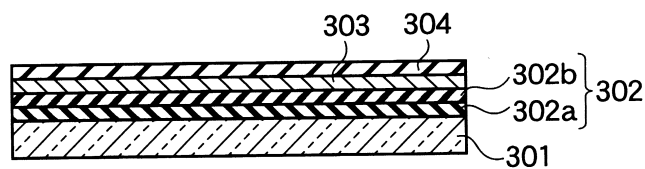
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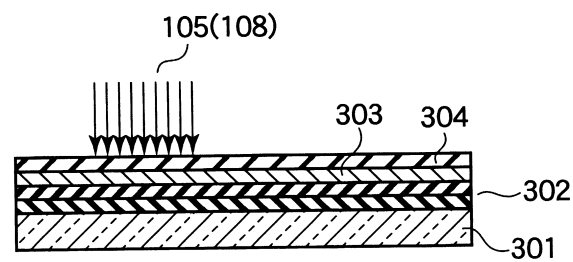
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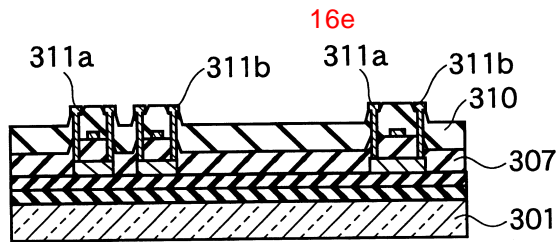
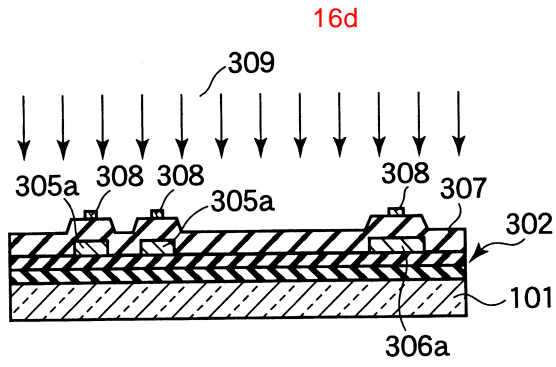
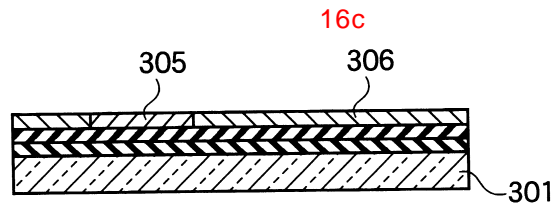


16a

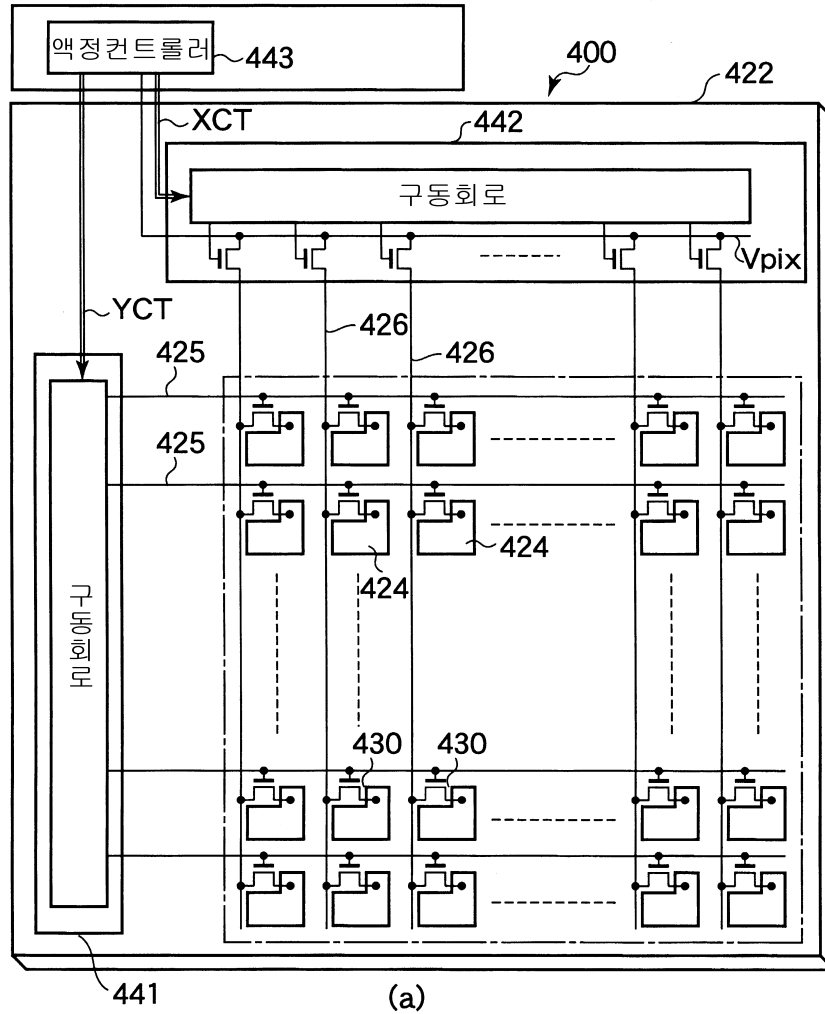


16b





17a



(a)

17b

