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(A)

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(43)

2003-0061352  
2003 07 18

(21) 10-2003-0001631  
(22) 2003 01 10

(30) JP-P-2002-00003005 2002 01 10 (JP)

(71) 가 가 가 , . 1753

(72) 5 7 1 가 가  
5 7 1 가 가

(74)  
:

(54)

LCD  
1 , 1 , 2  
1 , 2 , 2  
가 , 가  
가 가 가

1  
1 , , , ,

1 1 IPS LCD

2	1	F-F'		,			
3a	1	1	ITO	LCD			,
3b	1	1	LCD	ITO			,
4 H	1	A-A' , B-B' , C-C' , D-D' , E-E'					G
5a	5c G	H	1 A-A' , B-B' , C-C' , D-D' , E-E'	1 1 LCD			,
6a	6c G	H	1 A-A' , B-B' , C-C' , D-D' , E-E'	1 1 LCD	5a	5c	,
7		2	IPS	LCD			,
8	7	F-F'		,			
9a	7	2	LCD				,
9b	7	2	LCD				,
10a	10c G	H	7 A-A' , B-B' , C-C' , D-D' , E-E'	7 2 LCD			,
11		3	IPS	LCD			,
12	11	F-F'		,			
13a	11	3	LCD				,
13b	11	3	LCD				,
14 G H	11	A-A' , B-B' , C-C' , D-D' , E-E'		,			
15		4	IPS	LCD			,
16	15	F-F'		,			
17 G H	15	A-A' , B-B' , C-C' , D-D' , E-E'		,			
18		5	IPS	LCD			,

19 18 F-F' ,  
 20 6 IPS LCD  
 21 20 F-F' ,  
 22 LCD  
 \*  
 1 : 24 :  
 26 : 26a, 26b :  
 27 : 30 : TFT  
 30a : 30b :  
 30c :  
 39a, 39b, 39c : 42a, 42b :

(LCD) LCD ,  
 (TFT ) LCD  
 , LCD  
 LCD 1 , (director)  
 , 2 ,  
 (TN) 2 LCD 1 LCD (IPS; In-Plane Swit  
 ching) , (lateral electric field)  
 IPS LCD TN LCD 가 ,  
 , IPS LCD ,  
 / 가 / (tilt angle) 가 가 ,  
 , 가 ,  
 , IPS LCD 가 LCD 가 ,

2000 10 27  
가 :

3123273

(i) 가 (ii)  
(i) (ii) , 가 ,  
, 1997 3 18 9-73101  
, LCD 가 LCD  
, TFT  
, LCD  
) ( , ) 가 ( (dielectric relaxaion) 가 가 가  
( ) TFT 가  
(feed through) Vp' ) 가 가 ( flickers)  
, TFT (Cgs) , TFT가 ( : Clc) ( : Csc) TFT가  
, LCD TN LCD ( , )  
, LCD ( Vp) ( : Ccolor)  
( Vp) (1)

$$\Delta V_p = \frac{C_{gs}}{C_{gs} + C_{sc} + C_{lc} + C_{color}} \times (V_{gon} - V_{goff})$$

Vgon Vgoff TFT  
(Csc) 가 ( Vp) , IPS LCD

(mode) LCD IPS LCD

IPS LCD (common storage)

가 가

IPS LCD

IPS LCD 가

LCD 가

Cr, Ti, Mo, W, Al

TFT 가

TFT 가

가 가

가 가

가 가

가 TFT 가 2

가, IPS LCD , 22 가 (column)

LCD 가 가

가 , IPS LCD

1999 9 31 2973934

가 가

( , 2 ) , 2

LCD , 2 , 2 가

가 가

가 TFT 가







2, 1 LCD (1) (11), (11)  
 (12), (11 12) (11 12)  
 (13) (11 12) (13) 'LCD'

(13) 가 (11) (12) (1)

2 (12) (14) 가 (11)  
 (21) 가

(12) 가

16) (12) 2 (16), (16) (17), (  
 (17) (17) (18), (18) (19)  
 (18) (17) (17)  
 (18) (R), (G) (B)  
 (19) (18) (18) (17) (19)  
 LCD (13)  
 (15) 2 (16) (14) (15)

(11) 가

0c), (11) 1 (22), (28), TFT (30) (3  
 (26a 26b), 1 (23), (a-Si) (41), (24), TFT (30)  
 (30b), TFT (30) (30a), 1 (25a), 2 (25b), (26), (2)

7)

1 (22) (12) 2 (16) ( , ) (28),  
 (30c), (26a 26b) (22) 1  
 (30c) (28) 1 (23) 1 ( , ) (2  
 (30c) (26a 26b) ) a-Si (41) 1 (23)  
 (30a) 1 (30c) (24), (30b)  
 1 (25a) (25a) 2 (25b) 2 (25) 2 (26)  
 (27) 2 (25)

(11) (31) (12) (20)  
 1 (31 20) (13) (10° 30°)  
 (homogeneously) (26) (31 20)  
 LCD (11 12) (13)

(11) 가 3a, 3b, 4

3a 1 2 3b ( , )  
 ITO)가 4 A-A' (TFT(30)), B-B' ( (26)  
 (39a)), D-D' ( (42b) (39c)), E-E' ( (27) )  
 4 가 1, 2, 3a 3b (26a 26b) (G)  
 (24) (H)

3a (11) (28; )  
 (26a 26b; X ( , 1 가 ) (Cr)  
 1 LCD (26a 26b) 가 (

28) (TFT (30) (30c)) X Y ( , 1 )  
 (28) (26a) (26b)

가 , (24; 가 ) ( , Cr) 2  
 Y , TFT (30) X (30a 30b) (42a 42b) 2  
 (42b) (28) (42a) ( ) (28) (自段) (42a)

(30c) TFT (30) (28) (24) (30c) 1 (23) , T  
 FT (30) a-Si (41) . TFT (30) (30a) (30b) (24) (24) (30c) (30b)  
 (28) (28) (30a) (42a) (24) (30b)

2 1 (25) 2 2 (25b) , 4 가 , 2 (25)  
 1 2μm 가 , (25) 가 . 2 (25) (25)

2 (25) , 3b (26) (27) (26) (26)  
 27) ( , ) , , (ITO) (26b) (24) (24) (28)  
 (26) X Y (24) (24) (27) (27) (28) (2)

8) (24) (24) (26) (27) (26) (27) (27) (27)  
 (columns)

(24) (26) (27) (26 27) (28)  
 (27) 3a (26) (26a 26b) (29a) (30b)  
 (42b) (39b 39c) (39a, 39b 39c)

(12) , (17) , 2 (17) (24)  
 (24) (26)

1 IPS LCD (1) , (28)  
 (26) (27) (13) (27) 1 2 (16 22)  
 (16 22)  
 , LCD (1)

(26) (27) ( , ITO) (26)

2 (42a 42b) 1 (23) (24)  
 (26a 26b) (42a 42b) (i)  
 , (ii)

(42a 42b) (24) 2  
 (30c) 가 (42a) (30b) (28) 가 (30b)  
 (42b) (42a) (39c) (27) (42b) 가 (47)

가 (39b) , (39a) (26) (26b)  
 , (30b) (27)  
 2 가 (42a 42b) (27)  
 2 , LCD (27) (1)  
 가 , 3a , (42a 42b) (26a 26b)  
 가 , (13)  
 , (26) , (24) (28)  
 (24) (24) (26)  
 L(D) L(COM) , 가 .

L(COM) > L(D)

(24) (28) ( , )  
 (26) (24 28) (24)  
 , ' 가 .  
 (26) (24) , (27)  
 (27) (26)  
 1 LCD (1) , (26) (24) ,  
 (24) (26) 가 1.5μm ( )  
 가 가 , (17) (24)  
 가 가 (17) (17) 가  
 가 .  
 , LCD (1) (24) , (17) (26) (17)  
 (24) (24) (17) (24) (26) (26) (27)  
 (24) (17) L(D) L(BM) , 가 ,

L(D) > L(BM)

(17) (24) 가 , (26)  
 1 , (17) 6μm , 6μm  
 가 LCD (1) 가  
 , (24)  
 (12) (17) 1 (17)가 LCD (1) (24) ,  
 (26) , ( ) (26) (24) ,

(dc) (26) (27)

(26a) (26b) (28) (26a) (26b) 1 (26) (26a) (39a) Cr, Ti, Mo, W Al

2 가

(26) 가 (ITO) 1 LCD (1) 100 / □ (26) (26a) (26b) LCD (1)

(26) LCD (1) (G) ITO 가 4 (H) (26) (ITO) (26) (ITO) 가 가

가

(26) (27) 가 1 LCD (1) 2 LCD (1) (26) (27) (26a) (26b)

(26) (24) (24) (26) 2 ( ) (d) (d/ )가

1 3b (26) (27) (26a) (26b) (24) 1 LCD (1)

5a 5c 1 6a LCD (1) 4

5a TFT (30) Cr (22) (30c) (28) (22) 1 가 (23) (SiO<sub>2</sub>) (SiN<sub>x</sub>) 2

i (33) n Si(a-Si) (32) n<sup>+</sup> a-Si (33) 1 5a (23) n<sup>+</sup> a-S

30) a-Si a-Si (32) (33) 5b TFT ( ) (41) a-Si (32) (33)

2 Cr 1 (23) a-Si (41) Cr (30a) (30b), (24) 5c TFT (30) (42a) (42b) (42a)

5c 가 (42a) (26a) 1 (23) (42b) (26b) 1 (23) 3a TFT(30) (30c) (42a) (30b) TFT(30) (30c) (42b) (30b)

, a-Si (41; , a-Si (32 33)) (30a 30b)  
 , 6a (30a 30b)  
 a-Si (32) , TFT (30) .  
 , SiNx( , ) 1 (25a) (22)  
 SiNx (25a) , ( , ) 2 (25b) .  
 1 (25a) 2 (25b) , (25b)  
 ( ) , 6b (39a, 39b 39c)  
 (39b) , 2 (30c) (25) SiNx (30b) (27)  
 (27) (25a) (25) SiNx (30c)  
 (26b) (26b) (39a) , 2 (25)  
 SiNx (25a) .  
 2 (25) , SiNx (27) (39b 39c) (26) (39a) ,  
 ) 42b) , (39a) , (39b) (30b) , 1 (23) (39a)  
 (39a) (26a 26b) , (39c) (42a)  
 ITO (46) (22) (39a, 39b 39c) , (39a,  
 39b 39c) ITO (46) ITO (46) (11) ,  
 (26) (27) .  
 c) (11) , (42a) (42a) 2 1 (30)  
 2 (42a) , (27) (42b) (30c) 1  
 , (12) .  
 , (17), (18), (19) 2 (16)  
 가 ( , ITO )(15) . 가 LCD (1) LCD  
 (11) (12) ( )  
 , (11 12) (13)  
 ( n),  $1.5 \times 10^{12}$  cm +8(589nm 20 ) ( , ) 0.075  
 가 (13) ( , ) 4.0μm  
 20) (11 12) , (31 20) (31)  
 1 (27 26) 15° ,  
 , (21 14) (11 12) .  
 (13)( , LCD ) 1 LCD (1)  
 (13) (13)  
 , (27) (26)  
 (27) (26) (13) (11 12)  
 , (13) 4  
 5° , LCD  
 , LCD (1)

1 LCD (1) LCD IPS LCD

2

7 8 9a 9b 2 IPS LCD (2)

7 8 7 F-F' 9a 9b

1 LCD (1)

2 LCD (2) 1 LCD (30c) 2 (42b)

(30c) (42a) (11) 1 (42a 42b) (27)

, 1 LCD (1) LCD (2) (42a 42b) (42a 42b) 8 9

, (28) (43)

(12) 1 가

, 2 LCD (2) 10a 10c

, Cr (26a 26b) 1 5a (22) (30c), (28)

가 Cr (2) (43) 9a (43) 10a

, 5a 5c , SiO<sub>2</sub> 2 SiNx 2 1

(23) (22) , TFT (30) a-Si (41) 1 (23) 1

, 10b , 1 (23) 1 (23) (44a 44b)

) , 9a 10b , (43)( 1

), Cr ( , 2 ) (22) (30a 30b), (24), (42a

42b) , TFT (30) (42a) (42b) (42b)

, 10b (42a) (43) (43)

(44a) 가 , (42b) (43)

(43) (44b) 10b

9b , TFT(30) (30c) (42a) (30

b) , TFT(30) (30c) (42b) (

30b)

, 10c , a-Si (41) (30a 30b)

) , (30a 30b) a-Si (32 , S

iNx 1 (25a) (22) , TFT (30) SiNx (25a) , 2 (2

5b) 2 (25b) 1 (25a) ( ) , 2 (2

, 10c (39a 39b)

(39b) , 2 (30c) (25) SiNx (30b) (27)

(26b) (39a) , 2 (25) SiNx (25a)

(25) (27) SiNx (25a) (39b) (26a 26b) (39a) 2  
 ) 26b) , (39b) (30b) , 1 (39a) (23) (39a) (26a)

, ITO (46) (22) (39a 39b) , (39a  
 39b) ITO (46) (26) (27) ITO (46) , (11) , (39a

c) (11) , (42a) 1 (30  
 (42a) (42b) (43) 2 (44a 44b) (30c) (42b)  
 1 2

1 (11) (12) (13)  
 , LCD

(13)( , LCD ) 2 LCD (2) (13)

, (27) 26) (27) (13) (26) (11 12)  
 , LCD (13) 45 °

2 , LCD (2) LCD (2) IPS LCD ,  
 LCD (2) LCD (2)

, 2 LCD (2) (30c) (42a) (43) (43)  
 30c) (26a 26b), (42b) (28) (30c) Cr (43)  
 , Cr LCD (2) (13) 가 (43) 가 (13) (43)  
 , (43) (13) 가 (43) 가

, 2 LCD (2) , (43) (26a 26b) (28)  
 , (43) (13) 가 (26a 26b) (28)

3

11 12 13a 13b 3 IPS LCD (3)

11 , 12 11 F-F' , 13a 13b  
 1 LCD (1)

3 LCD (3) 2 LCD , 3 (42b)  
 (30c) (42a) (11) 2 (30c)

, 2 LCD (2) , (42a 42b) (26a 26b) (43)  
 28) 1 (43)

(12) 1 2 LCD (3) (28) (26a 26b) (43) 가 (26a 26b)

3 LCD (3) 14

5a (22) Cr (26a 26b) (43) (43) 13a 가

SiNx 3 (45) (22) (26a 26b) (43) Cr 3 (45) 3 (43) 1 2 (28)

1 (23) 3 (45)

a-Si (32) n + a-Si (33) 1 (23) a-Si (32 33) (23) TFT (30) a-Si (41) (23 45) (43)( 1 ) (44a 44b) (43) (44a 44b)

TFT (30) ( , 2 ) (22) (30a 30b), (24), (42a 42b) (42a) (42b) (43) (43) (44a 43) 13a 13b 가 (42b) (43)

13b TFT(30) (30c) (42a) (3) 0b TFT(30) (30c) (42b) (30b)

2

a-Si (41) (30a 30b) a-Si (32) (30a 30b) TFT (30) SiNx (25a) (25b) (25b) (25a) (25b) (25b) ( ) (30c) (30b) (25a) (25) SiNx (39a) 2 (25) Si (39a 39b) (27) (39b) , 2 (25) (26b) (26b) (25) SiNx (25a) (25) (26a 26b) 가, 1 (39a) (23) (39a) (26a 26b) (39b) (39b) (30b) (39a)

ITO (46) (22) (39a 39b) (39a) (39a) (26) (27) ITO (46) (11) (39b)

(11) (42a) 1 (30) (42b) 2 (42b) (30c) (43) (44a 44b) (42b) (43) (42a) 1 2 (43)



4 (25b) (47) (27) (25b) 4 (47) 2 (25) SiNx (47) (39a) ( ) , ITO ( ) ITO (22) 4 (47) (39a, 39b) 39c (26) (11) (30c) (11) (42a) 2 (42b) (27) (42b) (30c) 1 2 (13) (11) (12) (13)( , LCD ) 4 LCD (4) (13) LCD (4) LCD IPS LCD 4 LCD (4) (26) (27) (27) (27) 가 (27) 가 (26) 4 (26) (27) (27) (13) 가 , LCD 5 18 19 5 IPS LCD (5) 18 19 18 F-F' LCD (1) 5 LCD (5) 1 LCD 5 2 (25) (11) 1 (24) (26) 2 (25) , 5 SiNx LCD (25a) (5) (12) 1 2 (25) , 5 LCD 5 LCD (5) 6a 2 (25) (25) (42a) 42b) 5a 6b , SiNx (25) (30a) 30b), (24) (22) (30c) SiNx (25) (39a, 39b) 39c (27) (39b) , SiNx 1 (23) (39c) (30c) (26b) (39a) 1 (23) (39a) (30c) ( ) 26b) , (39b) (39a) (30b) , (39c) (23) (39a) (42a) 42b) ,

(39a) (26a 26b) .  
 , 1 (11) , , 5 (11) . (30c)  
 (42a) (42b) (27) (42a) 2 (42b) , 1 2 (30c)  
 1 (13) , , LCD (11) (12)  
 (13)( , LCD ) 5 LCD (5) (13)  
 LCD (5) LCD , 5 LCD ( 5)  
 5) LCD IPS LCD  
6  
 20 21 6 IPS LCD (6)  
 20 21 20 F-F' LCD (1)  
 , 1  
 6 LCD (6) , 1 LCD , 6 , (12) (1)  
 2) , 6 LCD (6) , (17) (16)  
 (16) , ( , ITO )(15) (17) LCD  
 (11) 1 가 .  
 1 (13) , , LCD (11) (12)  
 (13)( , LCD ) 6 LCD (6) (13)  
 LCD (6) LCD , 6 LCD ( 6)  
 6) LCD IPS LCD  


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 1 6 가 .  
 , (26) (27) , ITO .  
 ITO , IZO(Indium Zinc Oxide)  
 , ( , ' 1 ' 6 ) 가 , , 가 , 가 .

가 , . , , .

IPS , , 가 , 가 , 가 .

(57)

1.

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가 ;

가 ;

2

2

1

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1

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2

2

1

2

, 1

2

LCD .

2.

1

, LCD .

3.

1

, LCD .

4.

1

, LCD .

5.

1

, 1 2

1 2 LCD

6. 가 ,  
가

LCD .  
7. LCD .  
8. LCD

9. LCD .

10. 가

LCD .

11. LCD .

12. LCD ITO(Indium Tin Oxide) IZO(Indium Zinc Oxide)

13. ;

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가 ; 가 , 2 ;

2 , 1 , 2 1 , 1 , 2 , 1 , 2 , 1

1 2 가 , 1 LCD . 2

13 LCD 14.

13 15.

LCD .

13 16. 1 2

1 2 LCD .

13 17. 가 ,

가

LCD .

17 18. LCD .

17 D 19. LC

19 20. LCD .

21.  
13

가

LCD

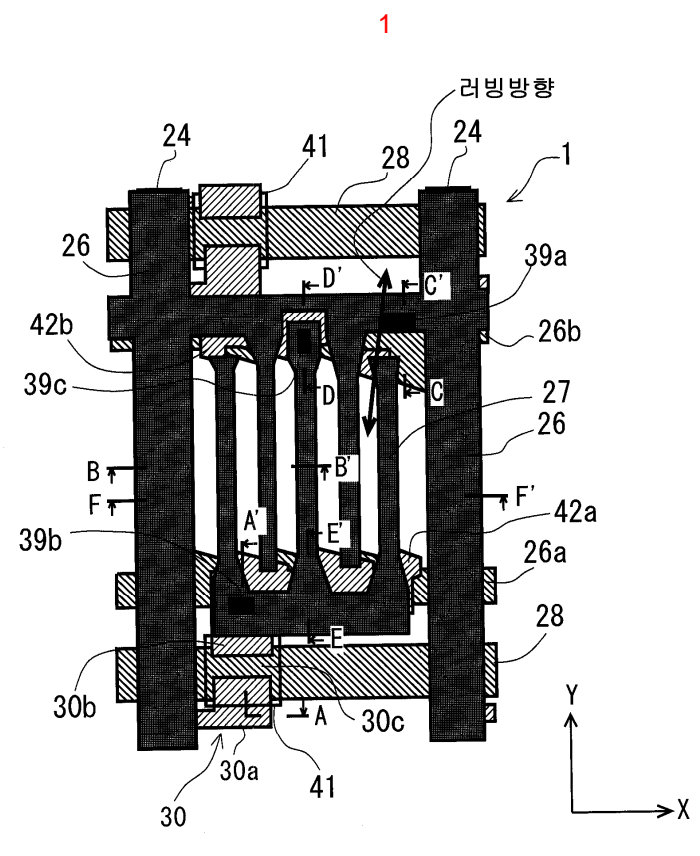
22.  
21

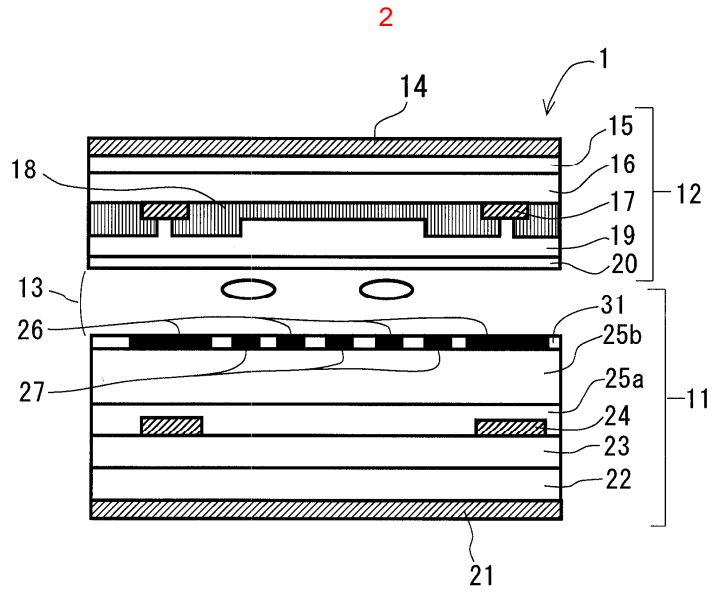
LCD

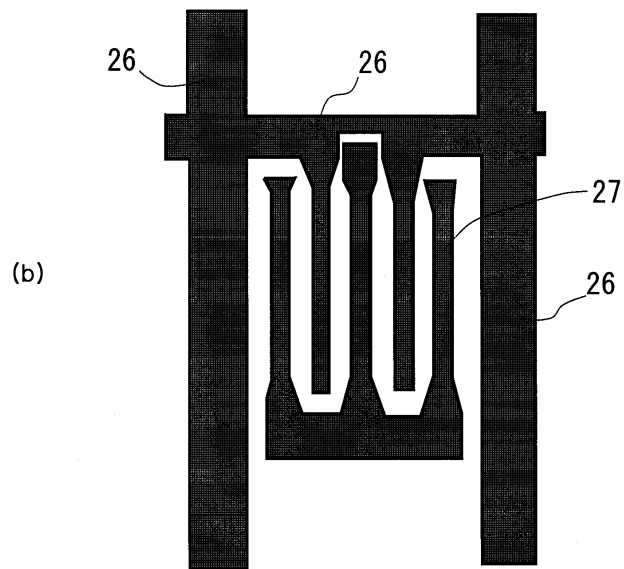
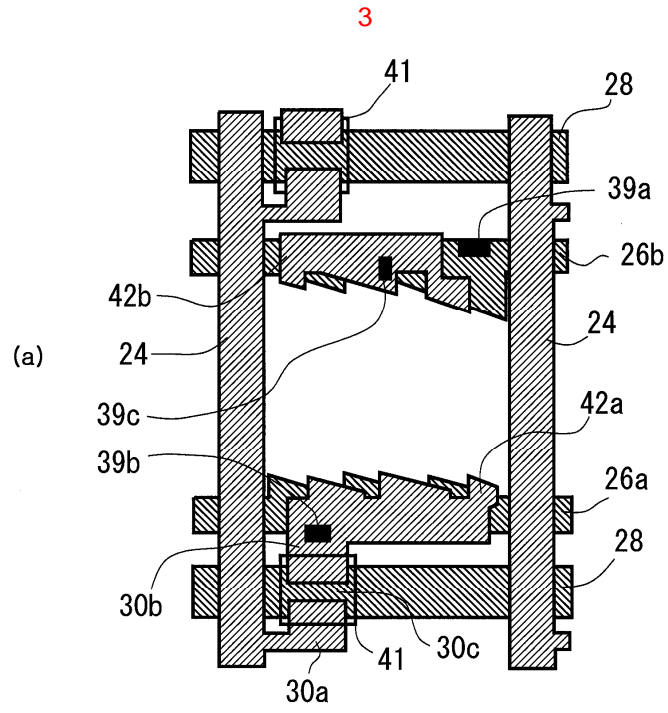
23.  
13

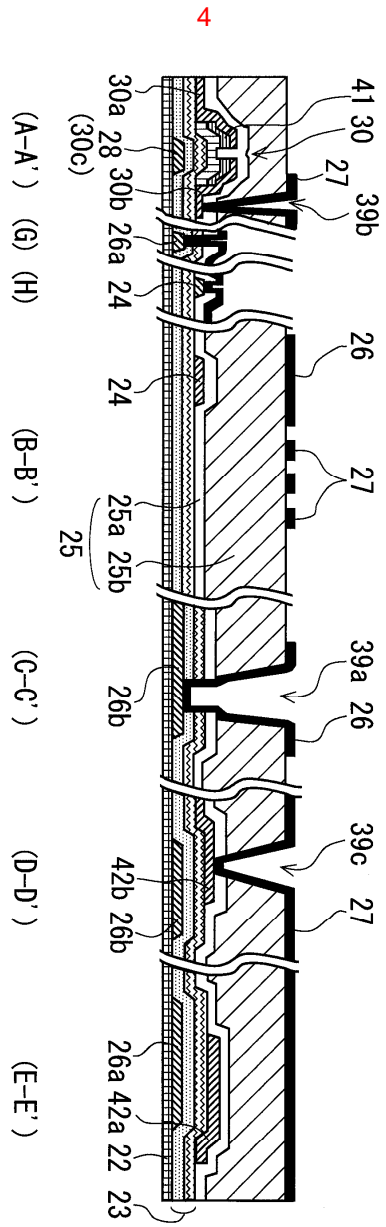
ITO IZO

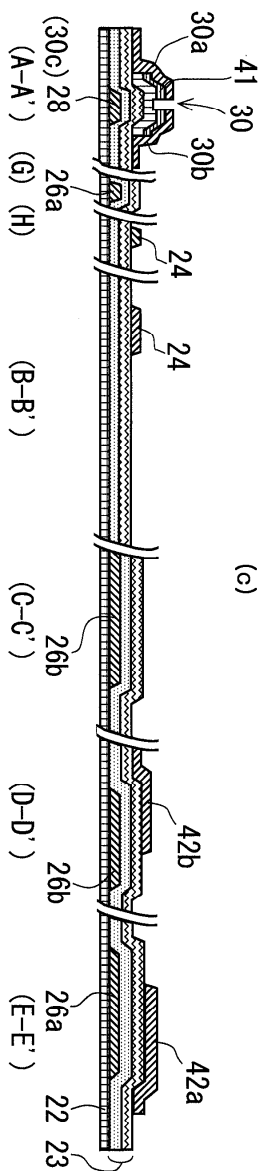
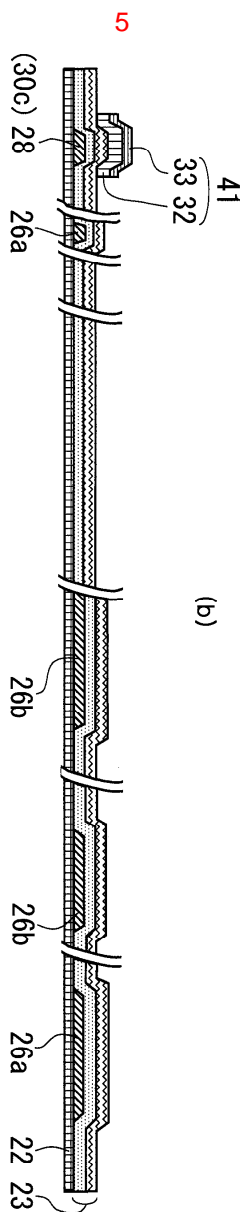
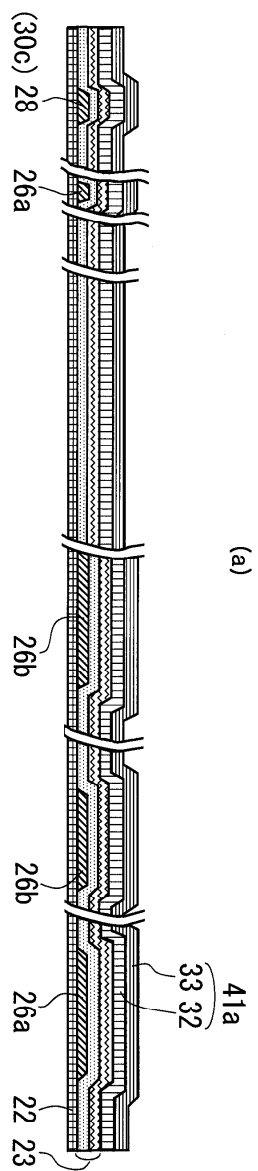
LCD

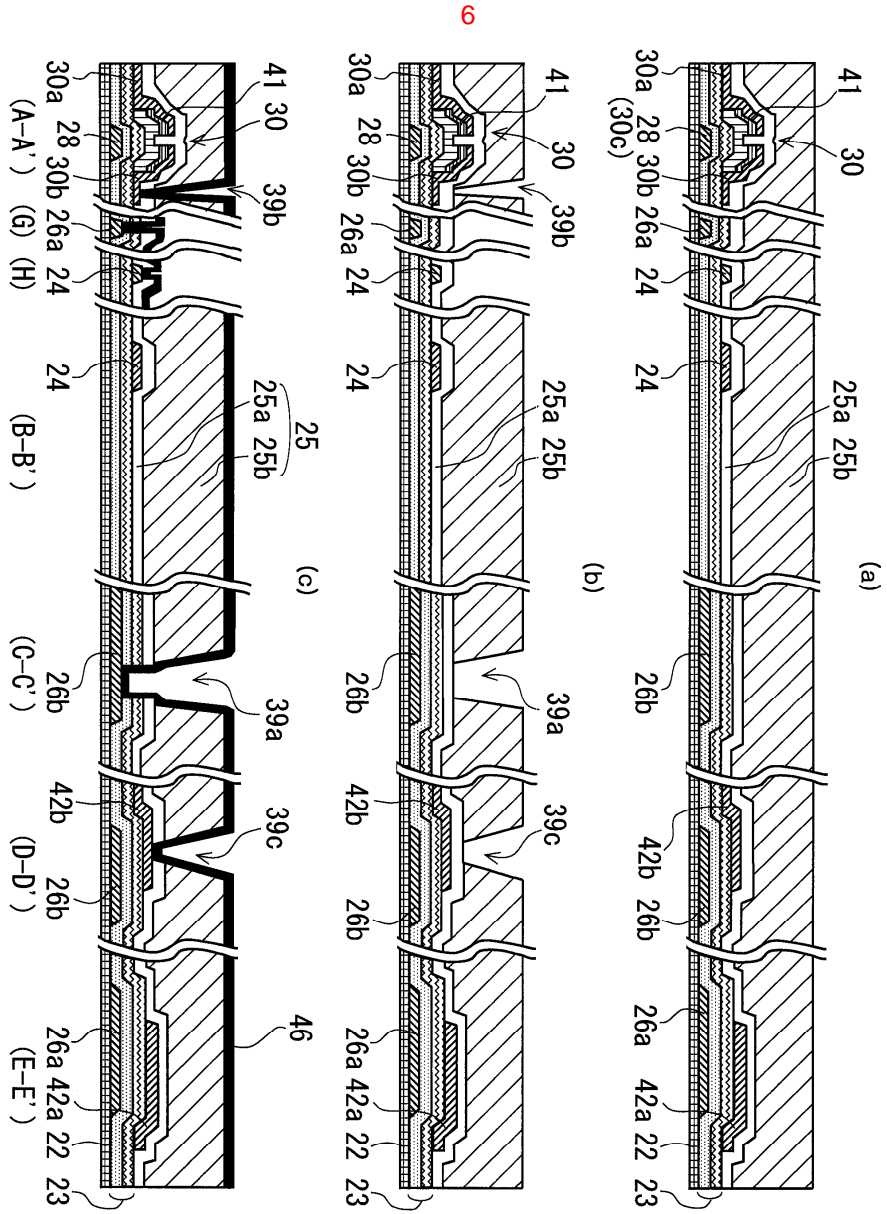






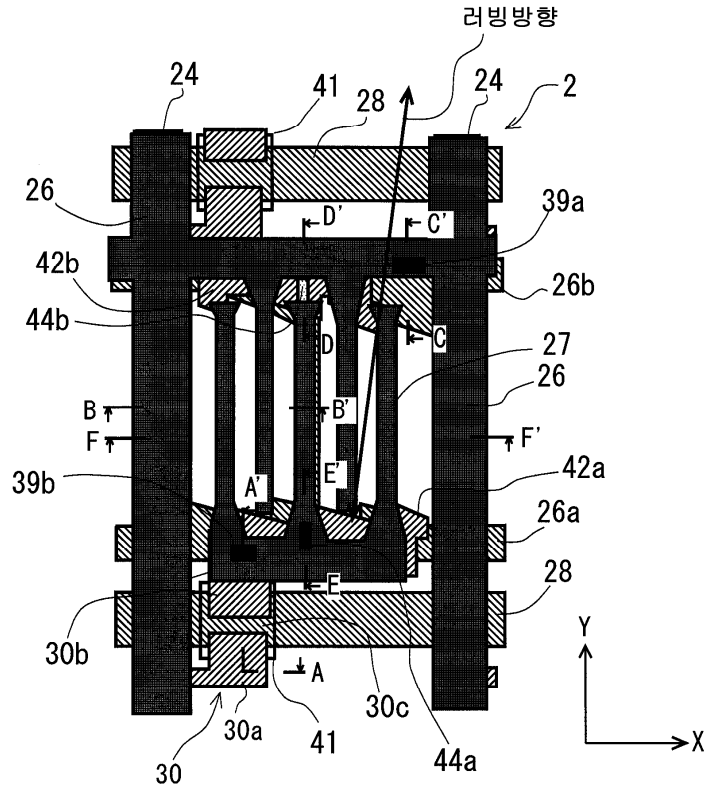




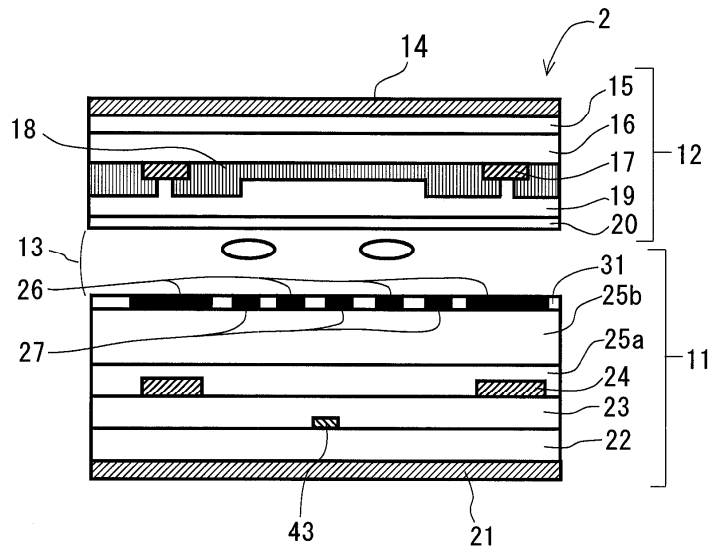


9

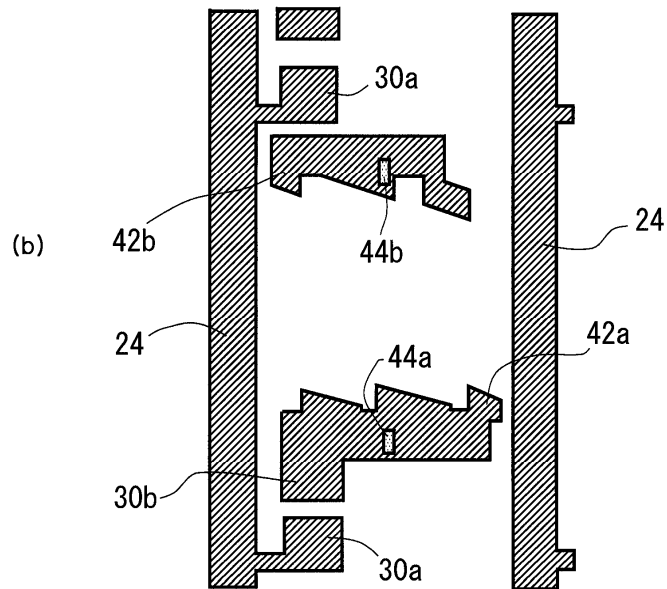
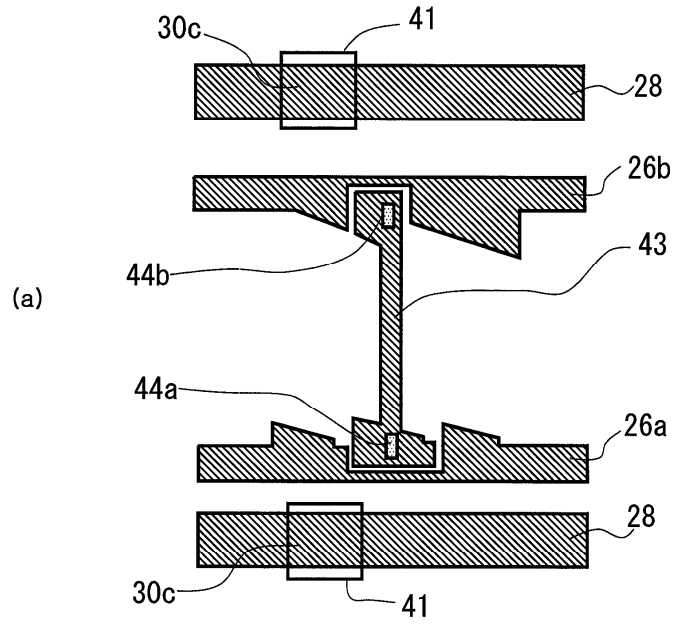
7

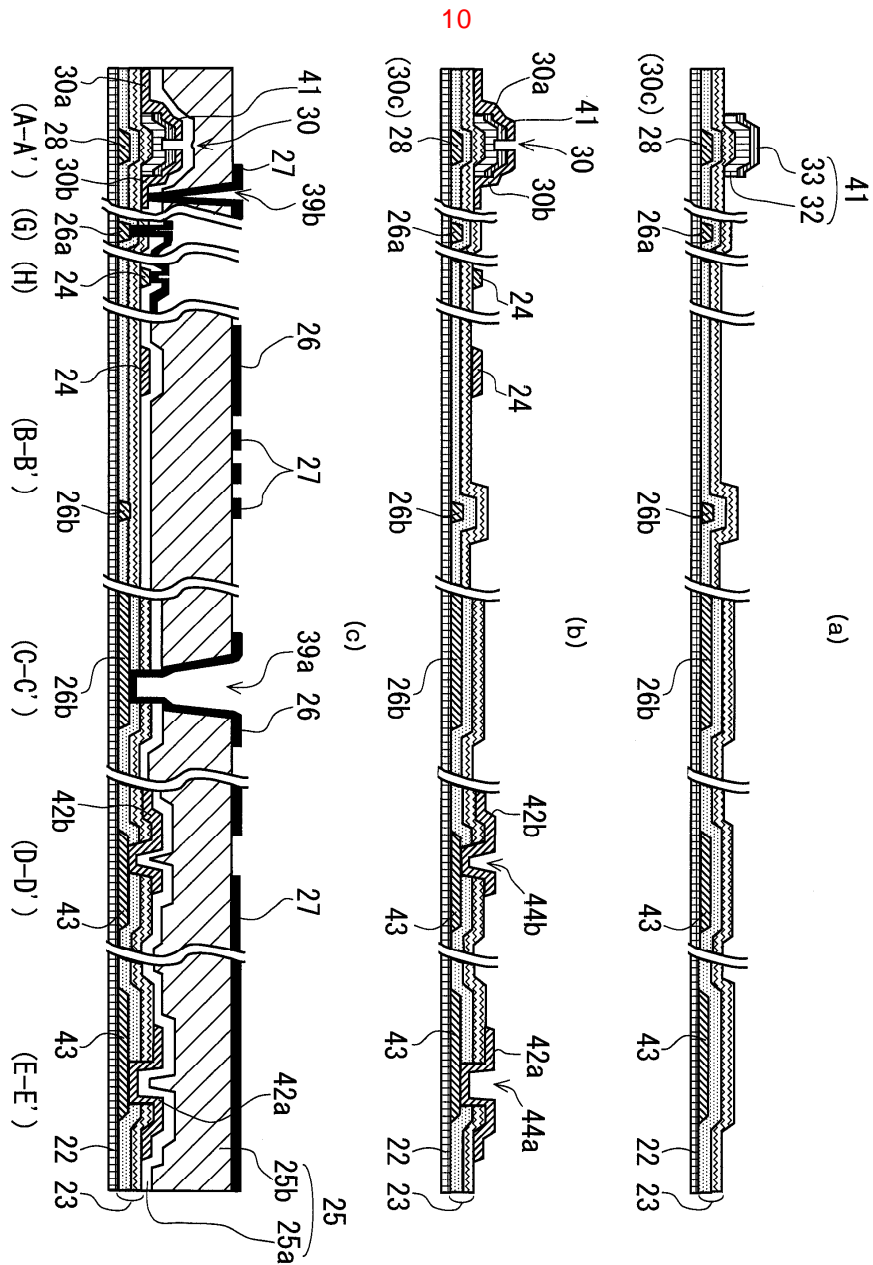


8

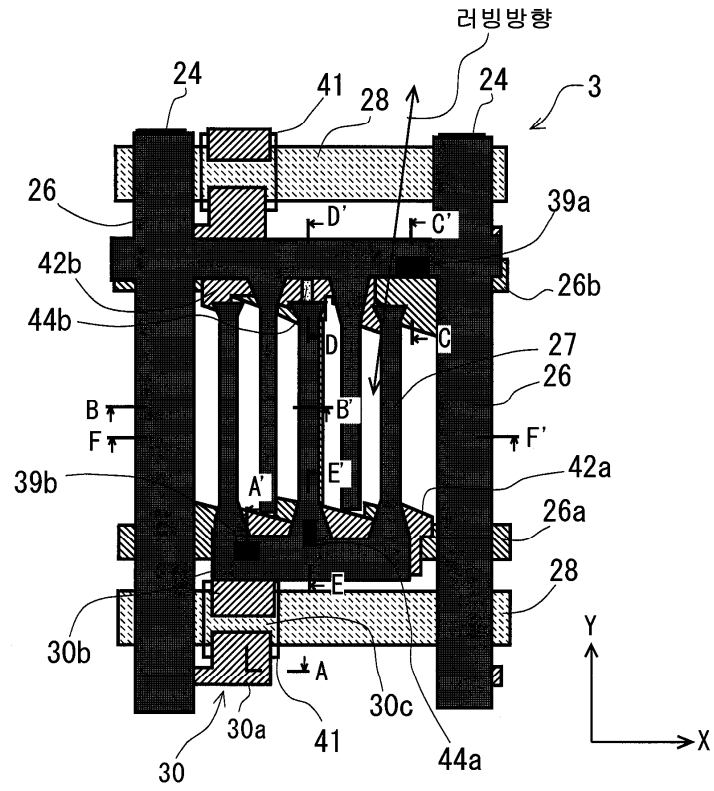


9

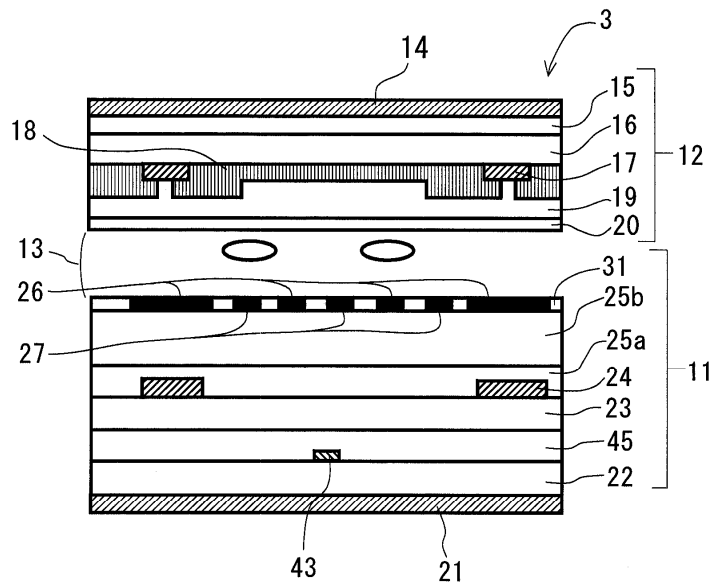




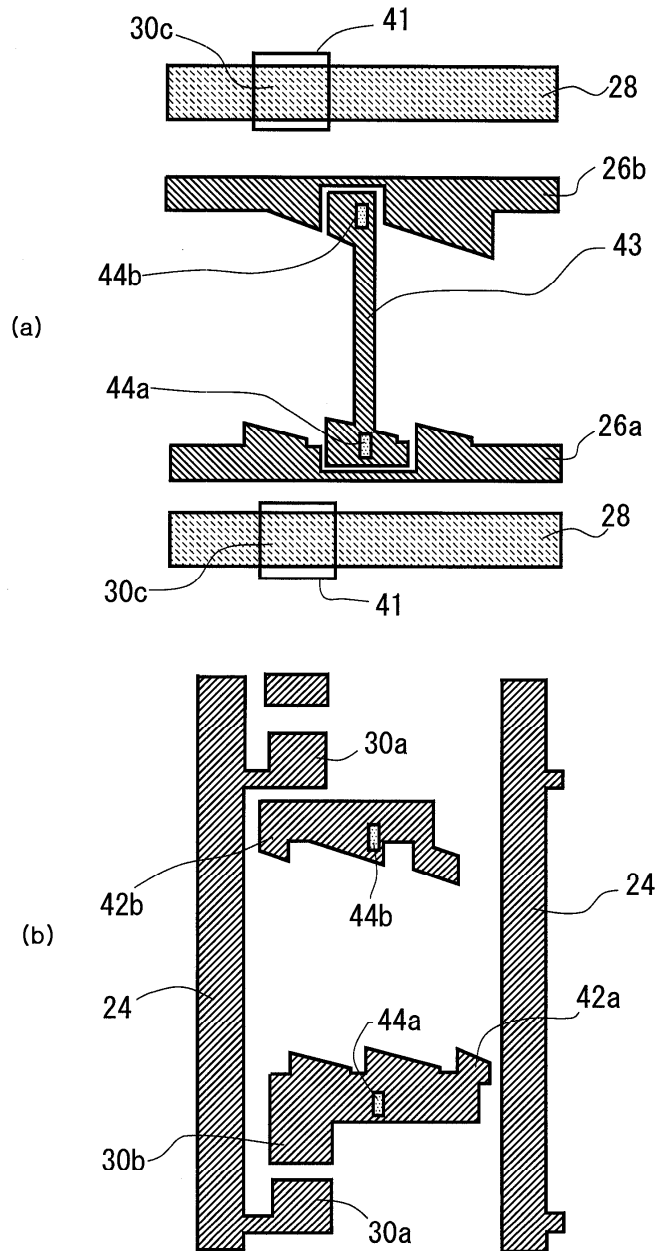
11



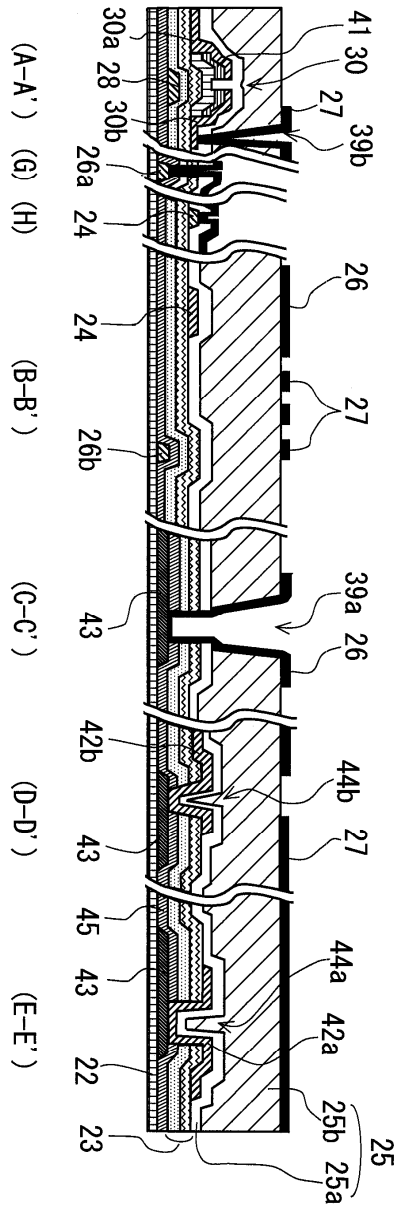
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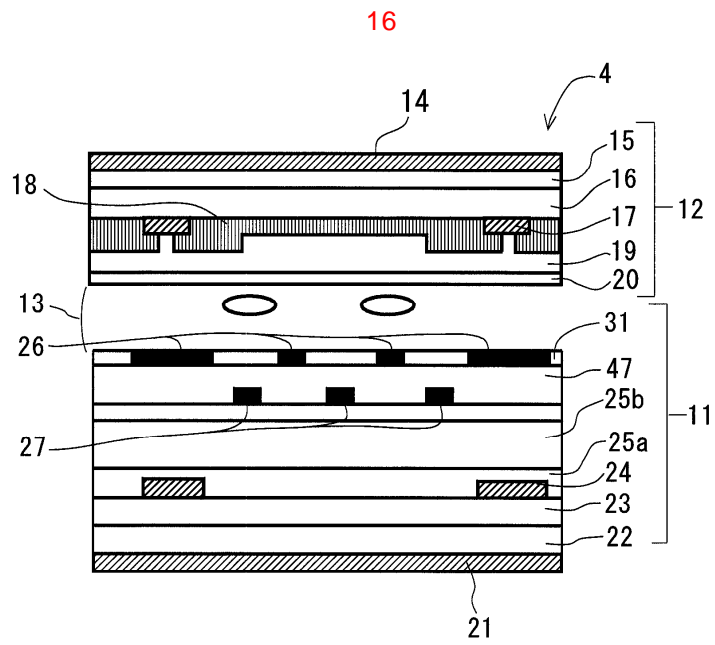
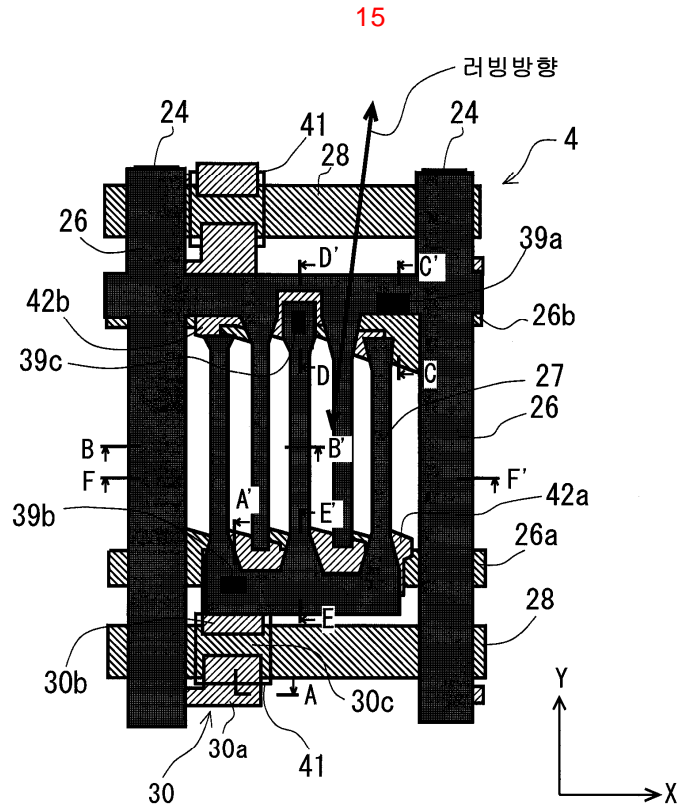


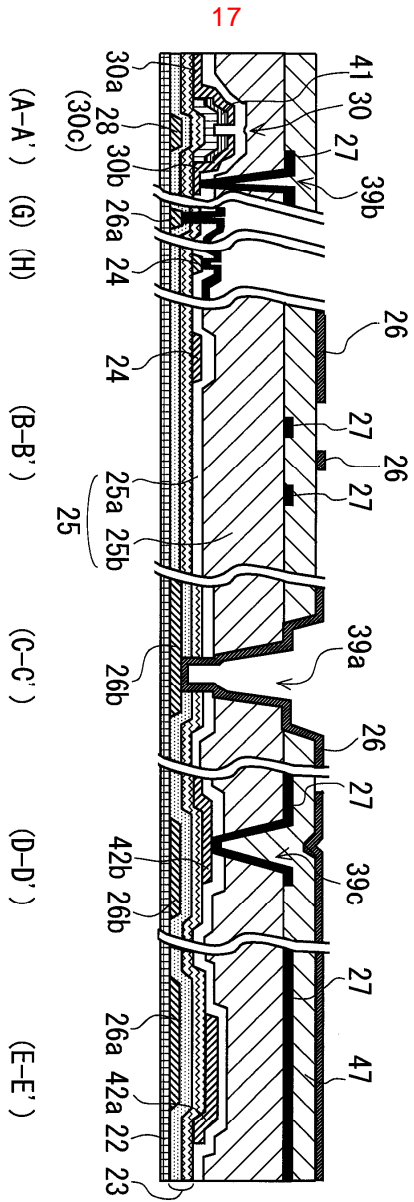
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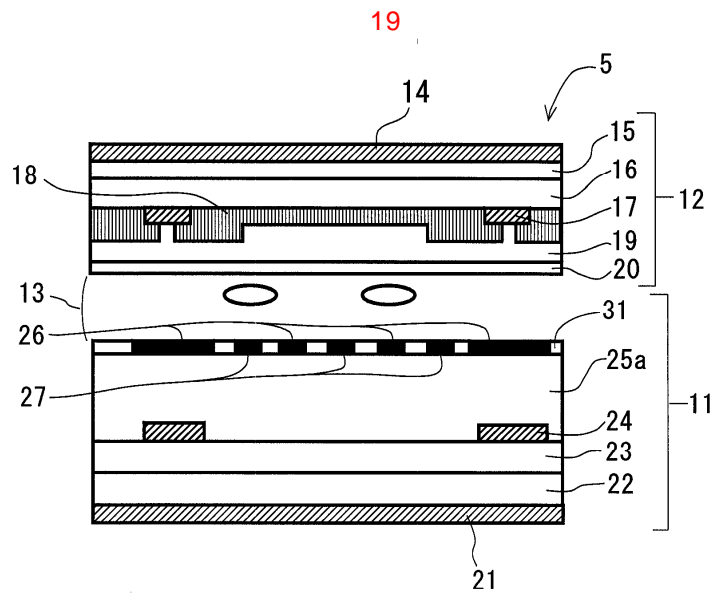
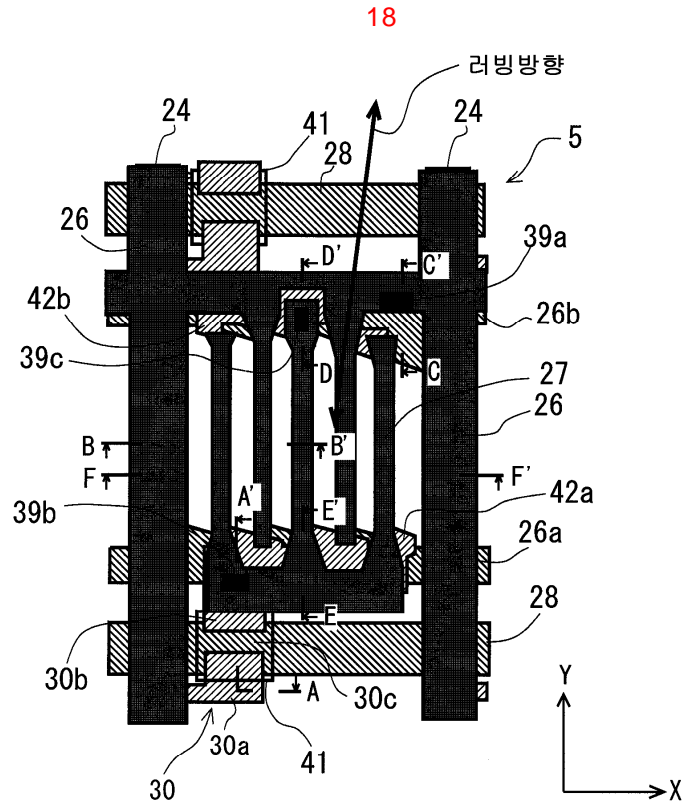


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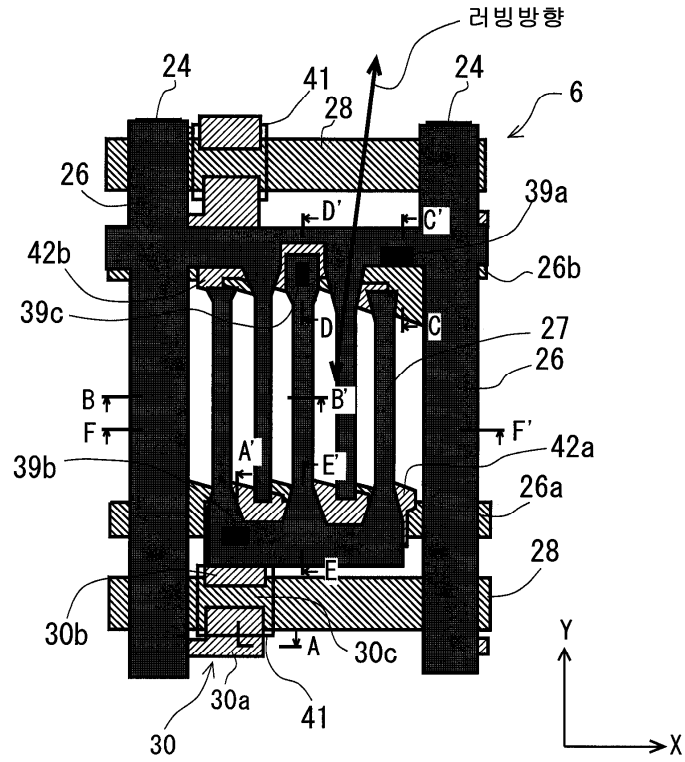




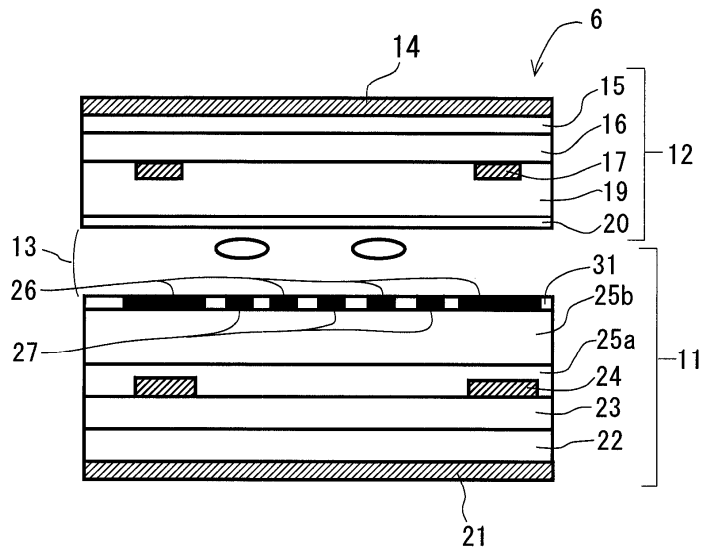


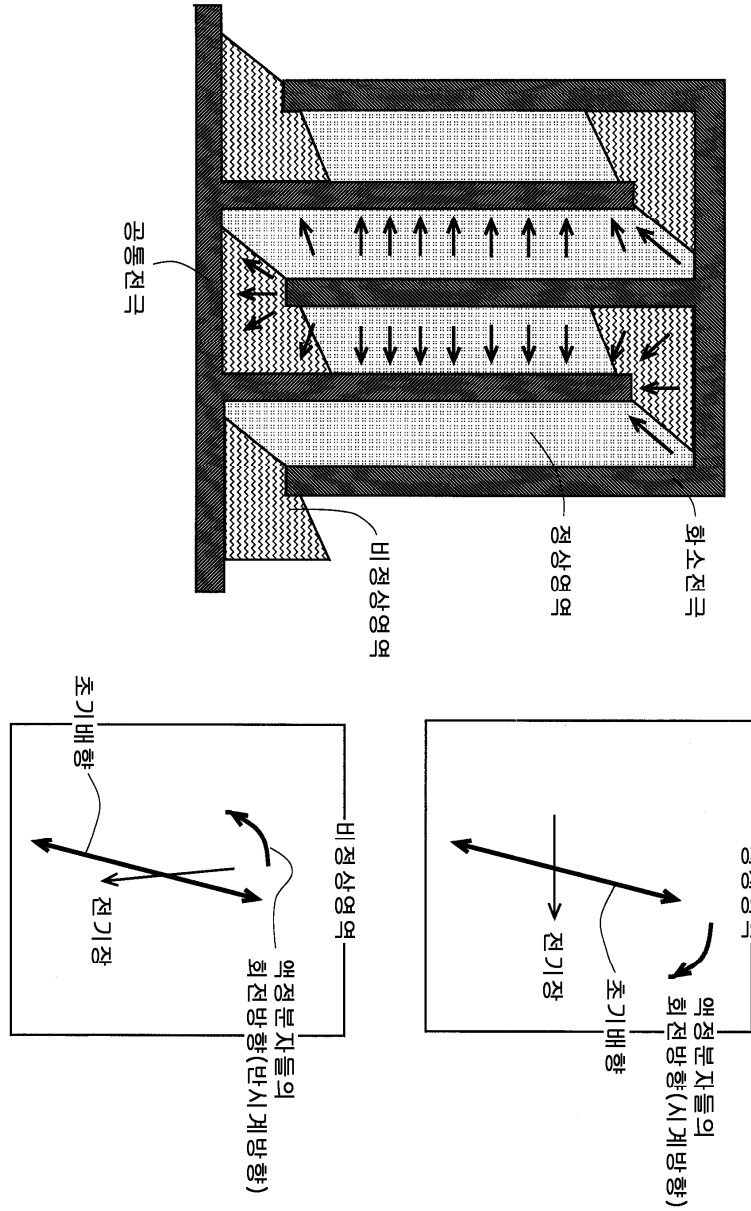


20



21





专利名称(译)	采用横向电场的有源矩阵寻址液晶显示器		
公开(公告)号	<a href="#">KR1020030061352A</a>	公开(公告)日	2003-07-18
申请号	KR1020030001631	申请日	2003-01-10
[标]申请(专利权)人(译)	NEC液晶技术株式会社		
申请(专利权)人(译)	日元号技术可否让这个夏		
当前申请(专利权)人(译)	日元号技术可否让这个夏		
[标]发明人	MATSUMOTO KIMIKAZU 마쓰모토기미카즈 HANNUKI TAKAHISA 하누키다카히사		
发明人	마쓰모토기미카즈 하누키다카히사		
IPC分类号	G02F1/1343 G02F1/1362 G09F9/30 H01L21/336 H01L29/786 G09F9/35 G02F1/1368		
CPC分类号	G02F1/136213 G02F1/134363		
代理人(译)	JO, EUI JE		
优先权	2002003005 2002-01-10 JP		
其他公开文献	KR100512896B1		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

使用横向电场的有源矩阵寻址LCD器件实现了高透射率和高制造产量并且在不增加制造成本的情况下改善了开口。在第一公共电极的公共电极线，所述第一像素电位层的像素电位层，以及通过绝缘层由第一存储电容器，用于每个像素，并在同一时间在所述第二公共电极的公共电极线，的像素电位层第二像素电位层和居间绝缘层构成用于相同像素的第二存储电容器。第一和第二像素电位层通过相应的像素电极彼此电连接。因此，由施加的电场引起的液晶分子的旋转完全有助于面板的透射率，从而防止可以降低的总透射率。这意味着可以获得更高的透射率。为了相同的目的，也可以提供互连电极。 1 指数方面 公共电极线，像素电位层，存储电容器，像素电极，面板透射率

