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(43)2002 - 0068963
2002 08 28(21) 10 - 2002 - 0009596
(22) 2002 02 22

(30) JP - P - 2001 - 00045883 2001 02 22 (JP)

(71) 가 가
가 가 398(72) 가 가 398가 가
가 가 398가 가

(74)

:

(54)

te) , 1 , 2 , (IAminA
가 . 가 ,
가 가 ,
가 .

1		.
2		.
3		.
4		.
5a	5b	.
6a	6b	.
7		.
8a	8b	.
9a	9b	.
10		.
11a	11b	.
12a	12b	,
13a	13b	.
14		.
15a	15b	.
16		.
17a	17c	, 17a , 17a 17c
18a	18b	.
19a	19b	.
20a	20c	.
21a	21f	.
22a	22b	.
23		.
24		.

1.

가 , (,)
 가 (full color display device)
 .
 (FPC; 가 ; flexible printed circuit), TAB(; tApe AutomAted bonding) TCP(; tApe cArrier pAckAge)
 가 , TAB TCP
 IC(; integrAted circuit)가 COG(; chip on glass)

2.

가 .
 , (, (exciton))가
 ,
 가 , 가
 ,
 , 1 μ m 가 . 가 ,
 (back light) , 가
 ,
 , 가 100 200nm ,
 ,
 ,
 가 ,
 , 100nm 가 ,
 , 가 , (; hetero structure) 5.5V 100cd/m² (1 : C.W. TAng And S.A. VAnSlyke, " OrgAnic electroluminescent diodes" , Applied Physics Letters, vol. 51, no.12, 913 - 915(1987)).

, 가 , , 가 , - , 가 ,
가 가 ,

.

. (,) , 가

, 가 .

가 .

, . ,

(CCM)

CCM 가

(CF)

CF

CCM (100%) , CF
가 , 가

가

, 가 가 , 가 가

가 가 , 가 가

가 ,

() ,

.

(

, Im/W) (2 : YoshihAru SAto, " JournAI of OrgAnic Molecules And B
ioelectronics Division of The JApAn Sosiety of Applied Physics" , vol.11, no. 1, 86 - 99(2000)).

2

, , ,

() , , , ,

, CCM CF
가 ,

가 .

CCM CF (CCM , CF) 가 ,
, , CCM CF 가
, 가
, CCM CF 가
가 ,
, , 가 , 가
가 100cd/m² 2 (half - life) 가
, (3; Masatoshi Aketani, " Monthly display" , Oct, 1998,
Special Issue on Organic EL Display, 100 - 104").

가 ().
CCM
가 , CCM
5
.
가 100cd/m²
(4 : YAsuhisa Kishikami, " Monthly Display" ,
Sep. 2000, 20 - 25).

가 , (8 -) - (tris(8 - quinolAt
e) - Aluminum; , Alq)
가 가 .

, Alq ,
Alq가 , 가 ,
, 가 (,
, Alq (,)가
, Alq .

, 1 가 ,
, .

1 ,
, 가 가 (,)
(,) ,
가 가 .

3 , .

가 가 가 가
(5 : Junji Kido, MAsAtO KimurA, KATsu toshi NAGAi, " MultilAyer White Light - Emitting OrgA
nic Electroluminescent Device" , Science, vol. 269, no. 3, 1332 - 1334(1995)).
(HOMO) (LUMO)(,) 가 ,
가 .

, (,
,) . 가 ,
, , 가
.

, 가
(6 : S. A. VAnSlyke, C. H. Chen C. W. TAng, " OrgAnic electroluminescent device
with improved stAbility" , Applied Physics Letters, vol. 69, no.15, 2160, 2162(1996)).
가
.

가 , .

[illegible]

, (,) , 가
 . 가 , , ,
 가 .

() ,
 4 .

4 (411), (412) (413) (411)
 (401) . (412) (402) . (413)
 (401) (402) 4 , 1 (1
 13) , (114) 가 . , .

가 , 4 가 , (401)
 (411) , (402) 가 (413)
 . (413) , (401) , (402)
 402) . , 2 .

, , ,
 . 가 , 가 .
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5a 5b
 , (501)가 (500) , (503)
 . 502 .

5a (504), (505)
 (506) 가 . , 가 2 (50
 8) 가 1 (507) , 가 2 (50
 가 .

5b (514), (519)
 (515) (516)
 가 1 (517) , 가
 2 (518) 가 .

6a 6b
 (501)가 (500) , (503)가
 502 .

6a (504), (505)
 (506) 가 ,
 가 1 (507) , 가 2 (50
 8) 가 가 2 (601) 2 (601)
 가 2 (601)
 (505) 2 (601)
 6a (507) 2 (601) , 6b 1
 (507) 2
 3 2
 2 가 3
 3 가 2
 , 2 3 2 (, 1
 07) 2 (701) , 2 (508) 3 (702) , 1 (5
 8b 8B
 (801)가 (800)
 (803)가 802
 8b (804), (805) 가
 가 (806) 가
 8B (804) , (805)
 가 (806) (807) 가 (806)
 9b 9B
 (801)가 (800) (803)가
 802
 9b (804), (805) 가
 가 (806) 가
 (806) 가 2 (901) 2 (901)
 901)
 (806) 2 (901)

9b, (804) (805) 2 (901) .
 , 9B (805) 2 .

3 2 가 2
 3 가 , 3
 3 가 3 , 2

2 3
 (, (804) 2 (1001) , (805) 3 (1002) , 10) .

5a 10 (,) (,)

CCM CF , 가

11a (1110)가 , , 가

가 (ITO) 가
 (1110) A(1116), b(1117) c(1118))
 (1121), (1122) (1123)
 (502)) 가 11b((1110)

가, (1102) 가 (1101) (1110) , (1111) ()
 , ,). , (1110) (10^{-4})
 , , A(1112)가 가 (1121) . (: /s)
 , A(1114)가 .

(1103) , (1123) , (112
 1)가 1 (1105) (11b). , A(11
 14)가 (1121) , (1123) .
 , b(1115)가 b(1113)가 가 .

b(1115)가 , (1122) 2
 (1123) , (1122)

A(1116), b(1117) c(1118)
 24 . , 가 , 가
 가 24 , A(1112), b(1113), c(2411)가 ,
 (1121) A(1112), (1122) b(1113)
 c(2411)가 A(2401), b(2402) c(2403) .
 , A(1112), b(1113) c(2411)가 가 .

" " ,
 5b ,
 11b 가 , 가
 , ,

(1110)
 , 11b (1102) (1103)
 (1121) 가 (1102) ,

(, CuPc) , (, H₂Pc) - , ,
 , PEDOT) , (Lewis Acid) (, PSS) (, PI)가
 , , (,

가 - (, - 가)

4, 4' - () - (4, 4' - bis(diphenyl
Amino) - biphenyl; , TAD) , , 4, 4' - [N - (3 -) - N -] - (4, 4' -
bis[N - (3 - methylphenyl) - N - phenyl - Amino] - biphenyl; , TPD), 4,4' - - [N - (1 -) - N -
-] - (4, 4' - bis - [N - (1 - nAphthyl) - N - phenyl - Amino] - biphenyl; , α - NPD)
, 4,4',4" - (N,N -) - (4,4',4" - tris(N,N - diphenyl - Amino) - triphenyl Am
ine; , TDATA) 4,4',4" - [N - (3 -) - N -] - (4,4',4" - tris[N - (3 -
methylphenyl) - N - phenyl - Amino] - triphenyl Amine; , MTDATA)

가
Alq, (4 - - 8 -) (, Almq) (10 - [h] -
) (, BeBq) (mixed ligand complex) (2 - - 8 -) - (
4 - -) - (, BAAlq) , [2 - (2 -) -] (, Zn
(BTZ)₂) - 가
2 - (4 -) - 5 - (4 - -) - 1, 3, 4 - (, PBD) 1, 3 -
[5 - (- -) - 1, 3, 4 - - 2 -] (, OXD - 7) , 3 -
(4 - -) - 4 - - 5 - (4 -) - 1,2,4 - (, TAZ) 3 - (4 - -) - 4 - (
4 -) - 5 - (4 -) - 1, 2, 4 - (, p - EtTAZ) , (, BPhen)
(, BCP)

(, Li(AcAc)) 8 - - (, Liq)

Alq, Almq, BeBq, BAAlq, Zn(BOX)₂ Zn(BTZ)₂
가 , 4,4' - (2, 2 - -) - (, DPVBi) ,
4 - () - 2 - - 6 - (p -) - 4H - (, DCM)
(2 -) (, Ir(ppy)₃) 2, 3, 7, 8, 12, 13, 17, 18 - - 21H, 23H -
(, PtOEP)

가

가

가

, 12a 12b

12b

12ass
가

가

CF

CCM

12a , B - B

(1215)

(1205a

1205c)

[1]

5a

(501)

(502)

(500) (501) ITO가 100nm (5
01) 가 (500) 11a 11b . ,
()

MTDATA가 20nm 가
20nm , MTDATA TAD (spiro dimer of TAD;
, S - TAD) 3 /s .

S - TAD (504) 3 /s 20nm , S - TAD
DPVBi (, S - DPVBi) 3 /s
S - TAD S - DPVBi 1:1 1 (507) . (50
7) 10nm .

1 (507) , S - TAD , S - DPVBi (505)
20nm , S - DPVBi Alq
3 /s S - DPVBi Alq 1:1 2 (508)

2 (508) , S - DPVBi , Alq 40nm 가
(506) (503) , 400nm
S - DPVBi 가 .

[2]

5b (513) (512)

(510) (511) ITO가 100nm (5
11) 가 (510) 11a 11b . ,
()

, TPD (514) 3 /s 30nm , TPD
3 /s , BALq 3 /s
, 1:1 TPD Alq 1 (517) 1
가 10nm .

1 (517) , TPD , BALq (515)
20nm , (515) (519)
5wt% .

(515) , BALq ,
Alq 3 /s , 1:1 BALq Alq 2 (5
18) . 2 가 10nm .

2 (518) , BALq , Alq 30nm 가
(516) . 가 , Li(AcAc)가 2nm

, Al 150nm
가 .

[3]

6a

(500) (501) ITO가 100nm (5
01) 가 (500) 11a 11b . ,
()

, α - NPD (504) 30nm . , α - NPD 3 /s
, α - NPD Zn(BTZ)₂ (, 가)
1 Zn(BTZ)₂ 1:1 1 (507)
가 10nm .

1 (507) , α - NPD , Zn(BTZ)₂ (505) (505)
nm 10nm 20nm 20nm) 2 (601) 10nm(, 1 20
5wt% DCM

(505) , DCM , Zn(BTZ)₂ ,
BALq 3 /s , Zn(BTZ)₂ BALq 1:1 2
(508) . 2 가 10nm .

2 (508) , Zn(BTZ)₂ , BALq 30nm 가
(506) . (503) , Al:Li 150nm
가 .

[4]

7

(500) (501) ITO가 100nm (5
01) 가 (500) 11a 11b . ,
()

, α - NPD (504) 30nm . , α - NPD 3 /s
DPVBi 1:1 S - DPVBi 3 /s , α - NPD S -
nm . 2 (507) . 1 가 10
) 가 . (701) , 0.5wt% N, N' - (" Dmq"

1 (507) , α - NPD , S - DPVBi (505)
20nm , S - DPVBi , Alq

3 /s
:1 2 (508) (508) 10nm S - DPVBi Alq 1
wt% DCM 3 (702) 가 0.5

2 (508) , S - DPVBi , Alq 30nm 가
(506) , (503) , Al:Li 150nm
가

[5]

8b (803) (802)
가
(800) (801) ITO가 100nm (8
01) 가 (800) 11a 11b)
()

, α - NPD (804) 3 /s 40nm , α - NPD
, α - NPD BCP 1:1 3 /s (806) (806) 20nm

(806) , α - NPD , BCP 20nm
(805) 가 , Alq 40nm 가

(803) , Al:Li 150nm , α - NPD
가 가 (806) 가 , 8B 가 가

[6]

9B
(800) (801) ITO가 100nm (8
01) 가 (800) 11a 11b)
()

, α - NPD (804) 3 /s 40nm , α - NPD
, α - NPD BA1q 1:1 3 /s (806) (806) 20nm

(806) , α - NPD , BA1q 40nm
(805) 10nm(, 40nm On
m 10nm) 2 (901) 0.5% (rubrene)

, (803), Al:Li 150nm . , 가 .

[7]

10

, (800) (801) ITO가 100nm . (801) 가 (800) 11a 11b . , () .

, α - NPD (804) 3 /s 40nm . , 2 (804) 10nm(, 40nm 30nm 40nm)가 2 (1001) 0.5wt% DMq .

, (804) , α - NPD , BAlq 3 /s . α - NPD BAlq 1:1 (806) . (806) 30nm .

(806) , α - NPD , BAlq 40nm (805) 10nm(, 40nm On m 10nm) 3 (1002) 0.5% DCM .

, (803), Al:Li 150nm . , 가 .

[8]

. 13a 13b

(, TFT)가 , MOS TFT(, TFT) , TFT(, TFT)가 .

13a , 1301 . 가 () . (1301)

(1301) (1311) (1312)가 . , (; 1305) , (1304) (1305) . , 13a TFT TFT(, TFT)

, TFT(1302) p- TFT . n- TFT가 , TFT p- TFT가 TFT가 13a 13b . TFT n- TFT p- TFT .

TFT(1302) (1303) , 4.5 5.5eV
가 가 (1303) , , (1303)
(, ITO)
가 (1303) (1303) (1304)
(1304) (1305) (1305) 2.5 3.5eV 가
(1305)
(1303), (1304) (1305) (1306)
(1306) (1306) 가
(,)
1320 12a 12b
(1301) (1304) 가 (1304)
(1312) (1312) (1311) ()
))
08) CMOS 13a , n - TFT(1307) p - TFT(13
()
(1311) (1312)가 13a 13b
(1312) IC LSI가
(; 1303) 13a 13b TFT
TFT (1305) , (;
1303) TFT n - TFT
13a (1303) (1309)
(1303) (1303)
가 ,
(1303) (1309) 13b
(1303) 13a
13a 13b , (1310)가 (1311)
, 13a 13b 가 14
14 , (1410) 14
(1410) (, (eAves) 가)
(,) , (1405)
(1403)
14 (1405)가 가 ().

15a 15b 13b . 15a ,
 15b 15a P - P' . 13a 13b 15a 15b .

15a , 1501 , 1502 , 1503
 (1502) (1503)
 (1504) TAB(tApe AutomAteD bonding) (1505) ,
 , TAB (1505) IC(integrAteD circuit) 가 TAB TCP(tApe cArrie
 r pAckAge) .

1506 13b (1507)
 (1506)
 15b (1506) (1506a) (, ; 150
 6b 1506c) , (1506a) .

15b , 가 (1509) (1507)
 (1508) (1509) 가 (가 ,
 (,)
 (deoxidAnt) .

(가 , 가)
 가 , ,
 가 ,
 가 .

[9]

. 8 , , 가
 (). 16 .
 (TFT)가 TFT , MOS
 FT(, TFT)가 TFT(, TFT) , T
 (1601), (1611) TFT(1602) , (1612) 8

TFT(1602) 1 (1603) ,
 , 1 (1603) .

1 (1603) , (1604) (1604) 2 (1605) 2.5 3.5eV (1605)
 05) , 2 (1605) 2 (1605)
 가 , 2 20nm

1 (1603), (1604) , 2 (1605) (1606)
 (1606) , ,

1 ()(1603) 16 TFT , TFT
 TFT n- TFT 1 , 2

1607 , (1608) (1607)
 가 (, 가 가), (, 가 (1609)
)

1620 12a 12b
 , 가 (1607) (1604)
 , (1604)가

(1620) 8
 (1620)가 (,
)
 (blAck mAtrix; 1621)

(1614) , TAB (1613) TAB(TAB(IC()
) (1614) TAB
 TCP()

(가) 가
 가 , 가
 , 가

[10]

17a , 17b 17a P - P'

17a , 1701 , , PES(), PC(), PET(), PEN() .

1702 () , 1703 () 1704 (bAnks) (1702) (1703) 17a (1705) (1702) (1703) , (1705)

08 (1702) (1703) TAB (1707) 17 (1702) (mAss) 1709 (1703) (1706) , TAB (1707) TAB IC TCP .

17b , 1710 , 1711 (1710) (1701) 가 가 (1701) 가 () , 가

1720 12a 12b (1701) (1713) (1713)

17c (1712) 1713 17c (1704) (1710) (1714) (1715) 가 (1714) (1702), (1703), (1704) (1713) , 가 () 가 가 가

[11]

10

18b, TAB (1804)가 (1801){ (1802) (1803A, 1803b)
 } (1805) TAB (1804)
 (1805) 18b I/O ()
 (1806, 1809), (1807) (1808) IC가
 (1805)
 , 가 TAB
 TAB ,

[12]

8, 9 10

19a, TAB (1905) (1901){ (1902), (19
 03), (1904) (1903A, 1904A) } (1906)
 TAB (1905) (1906) 19a

19a, I/O (1907, 1910) (1908) IC가
 (1906) (1909) (1908)

가

[13]

가

20a, Tr, Cs
 Cs, Tr2 - (V_{gs}) Tr1, Tr2
 Tr1, Tr1 Cs (V_{gs}) V_{gs}

20b

4:2:1 . , 6 20b 6 32:16:8:

20c

TFT

가

, TFT

가

[14]

23

23 (2310) (Si), 1 (Gj), 2 (Pj) , (Vi) .
(2310) (Tr1, Tr2, Tr3, Tr4), (2311) , (2312)

Tr3 Tr4 1 (Gj) . Tr3 , (Si)
Tr2 . Tr4 , Tr2 Tr1
, Tr3 Tr4

Tr1 (Vi) , Tr1 Tr2 . Tr2 2 (Pj)
. Tr2 (2311) (2311) ,

Tr3 n- TFT p- TFT , Tr4 가 . , Tr3 Tr4
가 . Tr1 n- TFT p- TFT . Tr2 n- TFT p- TFT .
T , , , Tr2가 n- TFT TF

(2312) Tr1 . (2312) Tr1 (V
GS) ,

23 , (Si)

가

가

가

가

[15]

가 (가) .

가 , 1 μ m

가 ()

() ()

가 가

가 가 , 가 , /

21a 21f , 22a 22b . 13a

20c 가 .

21a (2101A), (2102A) , (2103A) ,

21b (2101b), (2102b), (2103b), (2104b), (2105b) , (2106b) , 가 ,

21c (2101c), (2102c), (2103c) , (2104c) , (2102c) , 가 ,

21d (CD, LD DVD), (2103d), (A)(2104d) , (2101d), (2102d) , (B)(2105d) , (A)(2104d) , (B) ,

CD ,

21e (2101e), (2102e), (2103e), (2104e) ,

[illegible]

21f (2101f), (2102f), (2103f), (2104f)
 . (2103f),

22a (2201A), (2202A), (2203A), (2204A),
(2205), (2206a), (2204A)
가, 가, 가, 가

22b (2201b), (2202b) , (2203b, 2204b) (, ,) . (2202b) , , 가 .

21a 21f , 22a 22b ,
 . (contrAst rAtio)가 100 150 ,
 . ,
 , 가

가
가

21a 21f , 22a 22b

가 . , 가

(57)

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1 가 ,

2 1 가 , .

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14 , 1 , 2 , .

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14 , 1 , 2 , .

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2 1 가 ,

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35 , 2 1 ,

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35 , 2 1 2 ,

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1 1 ,

1 2 ,

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2 1 가 ,

3 2 가 ,

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39.

38 , 2 1 , 3 2 ,

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40.

38 , 2 2 , 3 1

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가 가 , .

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1 가 ,

2 1 가 , .

47.

46 , 1 , 2 , .

48.

46 , 1 , 2 , .

49.

33 , , , , .

50.

34	,		,	,	,
		,	.		

51.

35	,		,	,	,
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52.

38	,		,	,	,
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53.

41	,		,	,	,
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54.

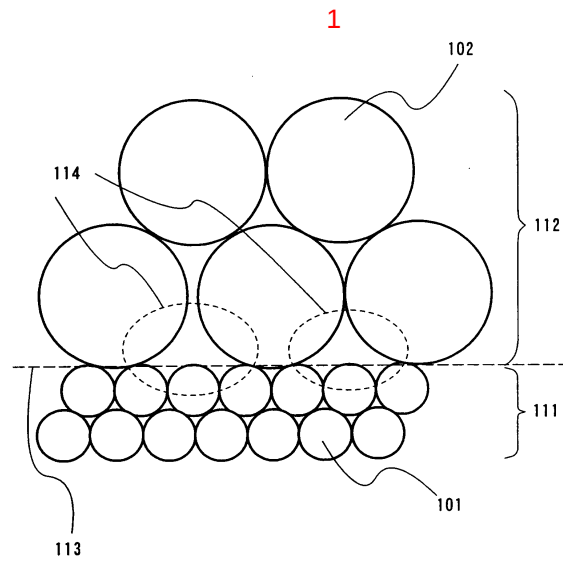
42	,		,	,	,
		,	.		

55.

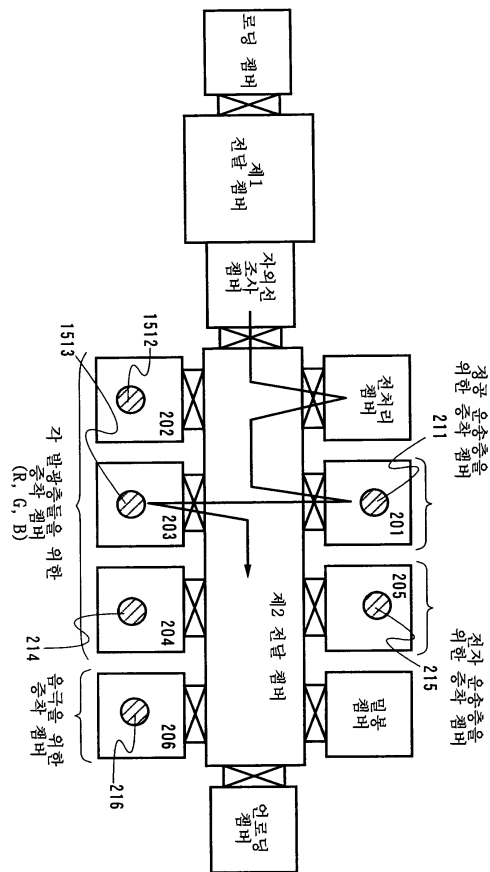
43	,		,	,	,
		,	.		

56.

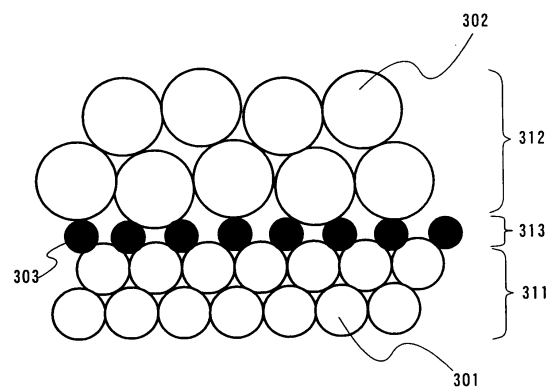
46	,		,	,	,
		,	.		



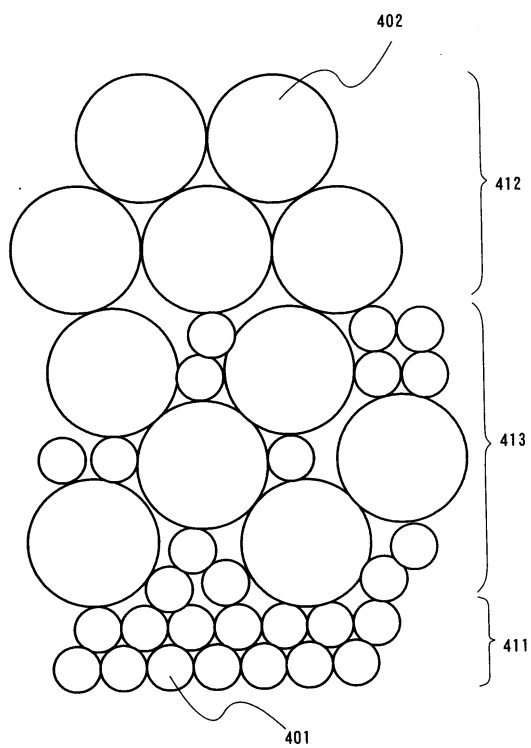
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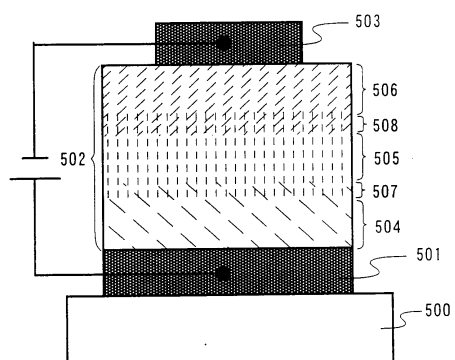
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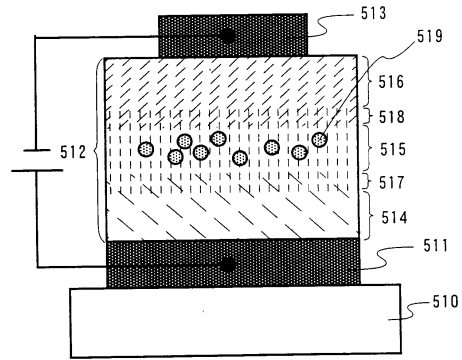
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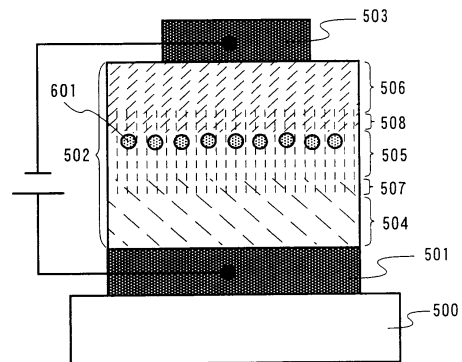
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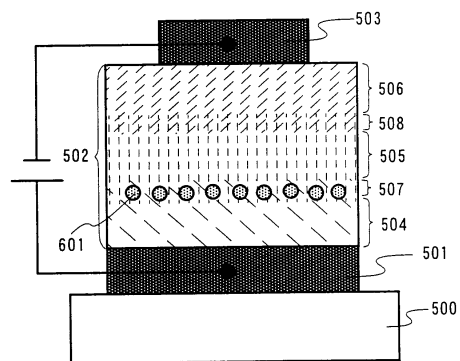
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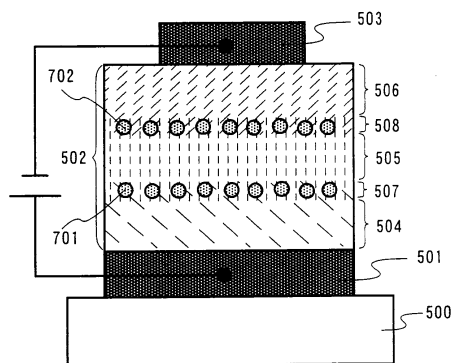
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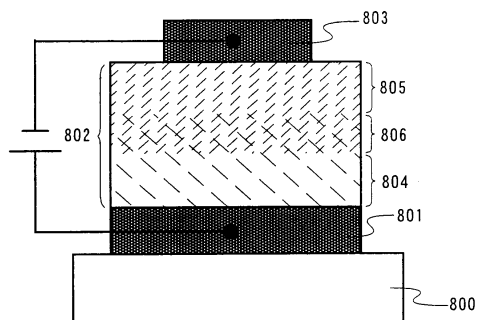
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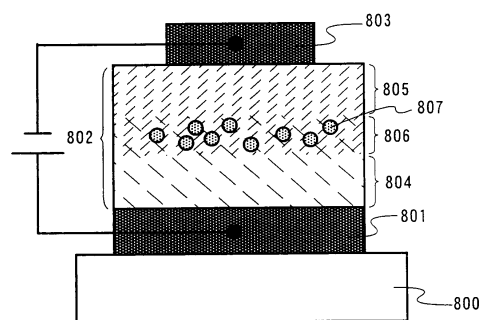
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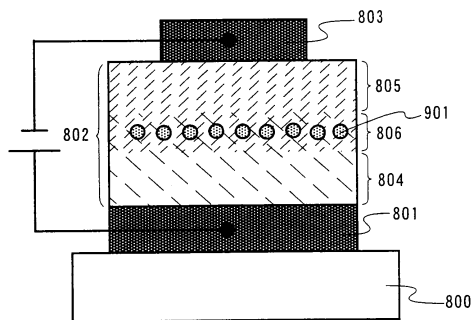
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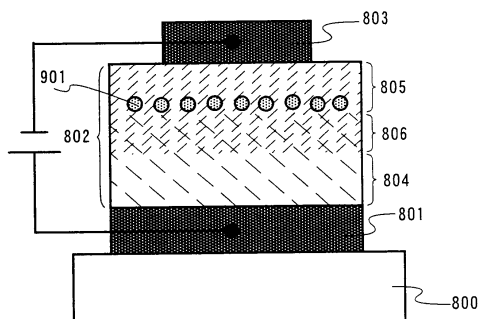
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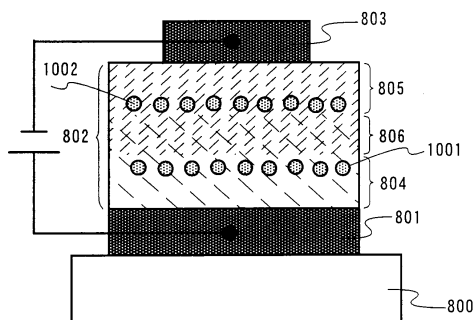
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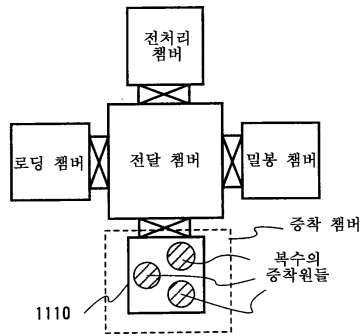
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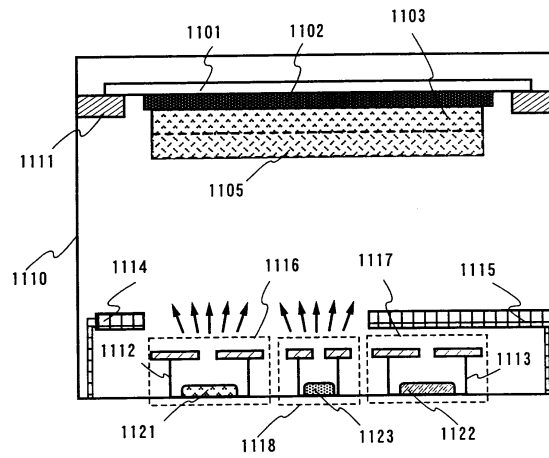
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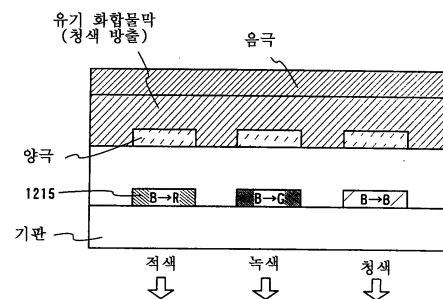
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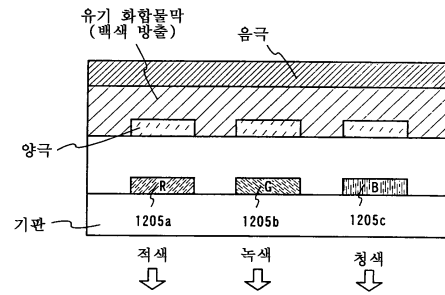
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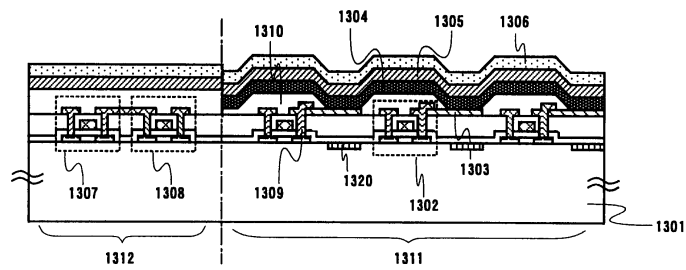
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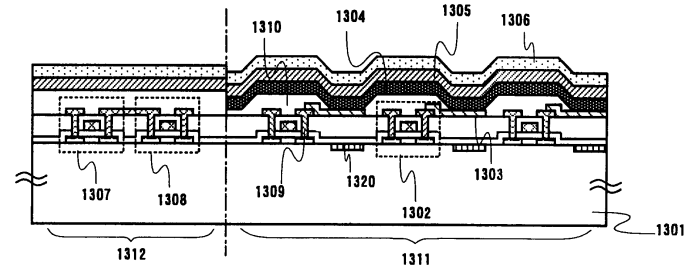
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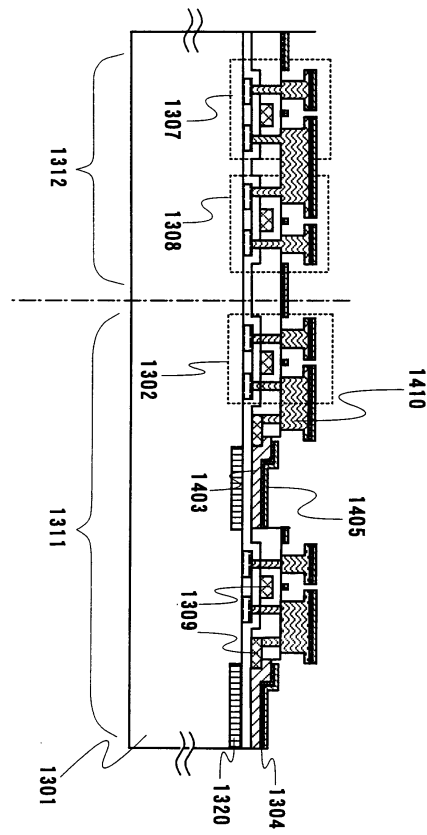
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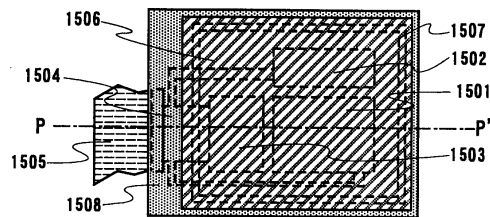
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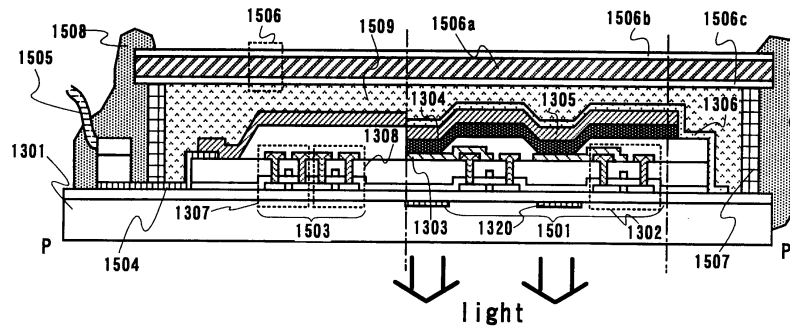
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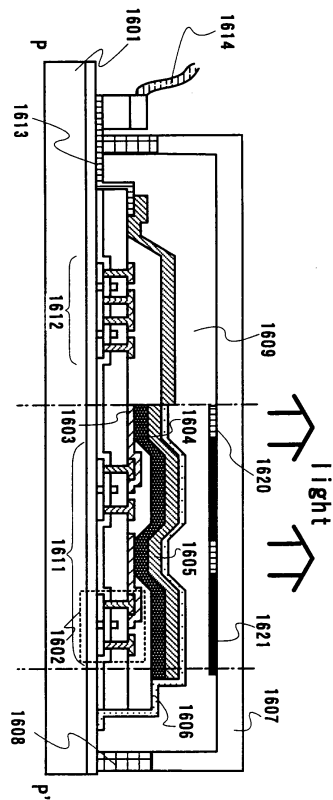
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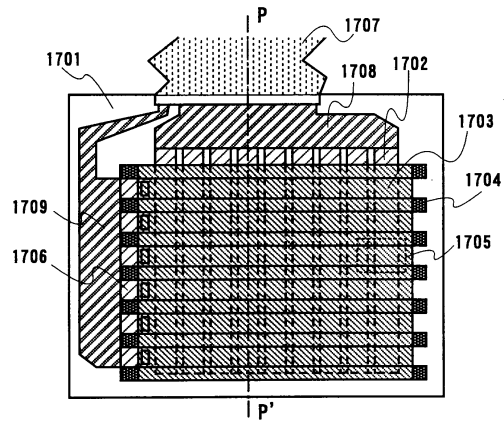
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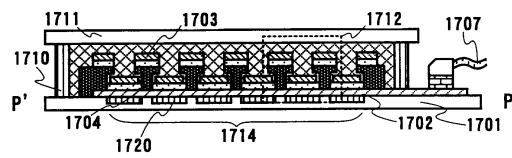
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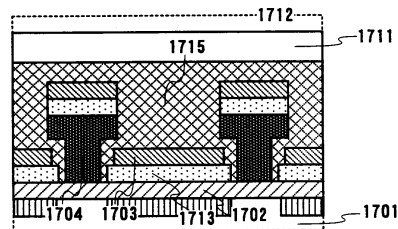
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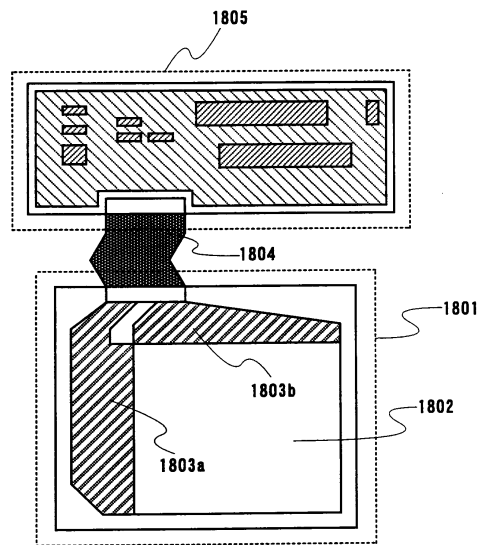
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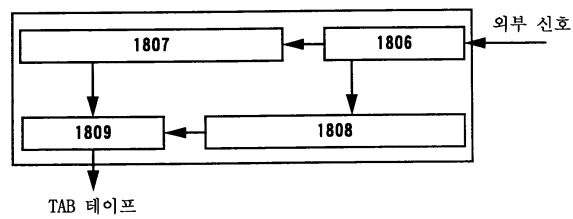
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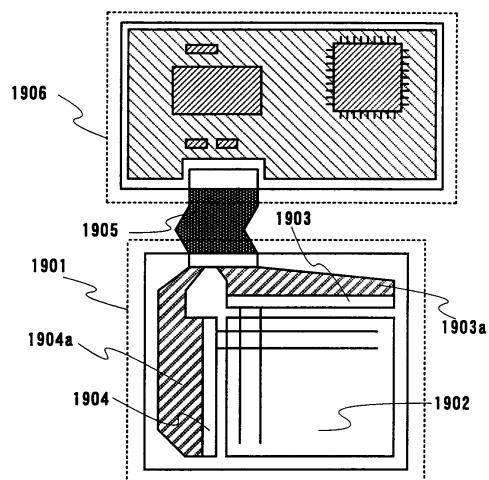
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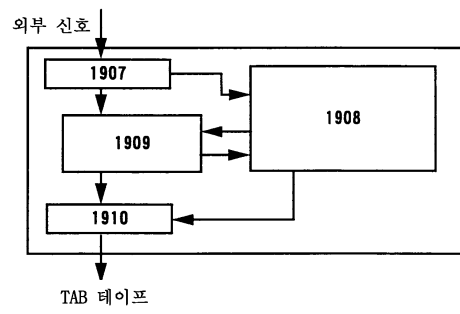
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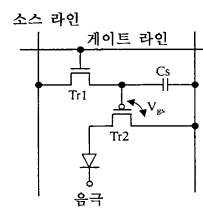
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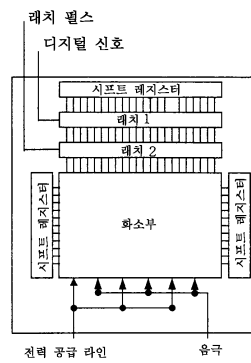
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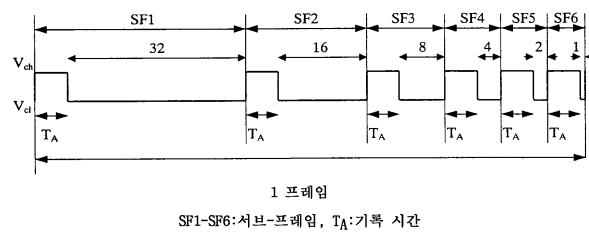
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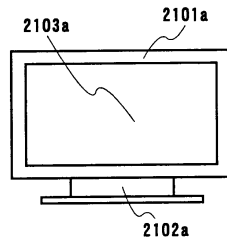
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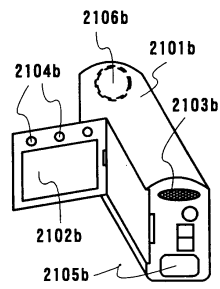
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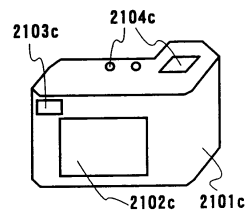
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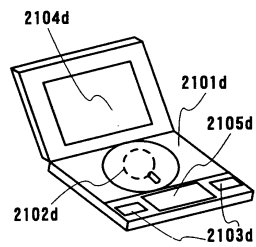
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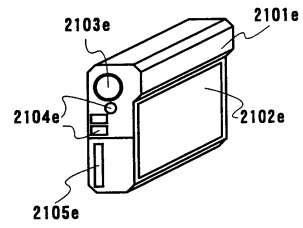
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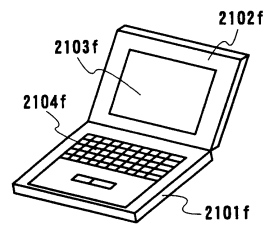
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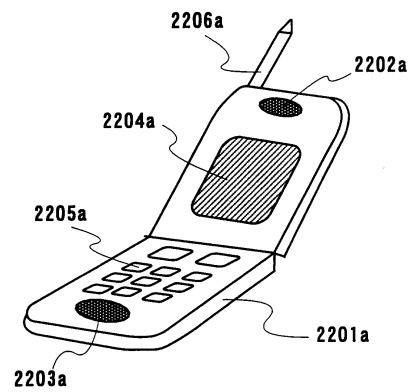
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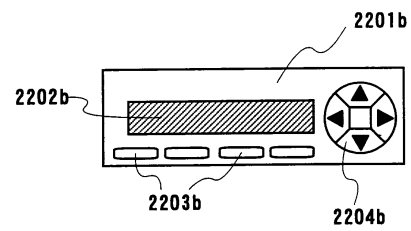
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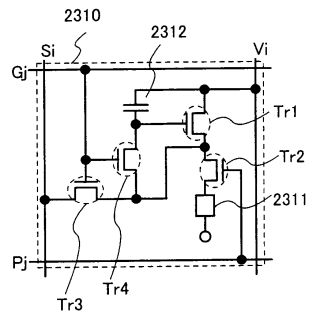
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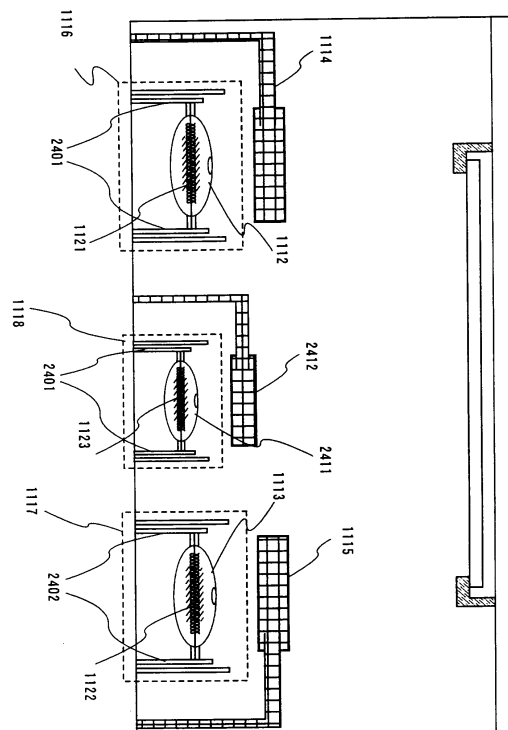
22b



23



24



专利名称(译)	有机发光器件和使用其的显示器件		
公开(公告)号	KR1020020068963A	公开(公告)日	2002-08-28
申请号	KR1020020009596	申请日	2002-02-22
[标]申请(专利权)人(译)	株式会社半导体能源研究所		
申请(专利权)人(译)	株式会社绒布器肯kyusyo极限戴哦		
当前申请(专利权)人(译)	株式会社绒布器肯kyusyo极限戴哦		
[标]发明人	SEO SATOSHI 세오사토시 YAMAZAKI SHUNPEI 야마자키순페이		
发明人	세오사토시 야마자키순페이		
IPC分类号	H05B33/22 H01L51/50 H01L51/52 H05B33/14 H01L27/32		
CPC分类号	H01L27/322 H01L51/5281 H01L27/3244 H01L51/5012 H01L27/3281 H01L51/5036 H01L51/5048 H01L51/5024 H01L51/5056 H01L51/5072		
代理人(译)	郝京基 孙某TAE YOUNG 李昌勋		
优先权	2001045883 2001-02-22 JP		
外部链接	Espacenet		

摘要(译)

有机化合物膜包括空穴传输范围，第一混合区，发光区，第二混合区和电子传输区。并且这些域框架是连接的。以这种方式，在常规层压结构中不存在其中获得的蓝色有机发光装置与所包含的有机化合物膜存在的层之间的界面。当将颜料掺杂添加到该器件结构中时，获得白色有机发光器件。通过本发明的方法提供具有高发光效率和长寿命的蓝色或白色有机发光器件。具有长的该有机发光装置的全色显示装置是颜色转换层，或者获得了与彩色滤光器组合的更少耗电的寿命。电子传输范围，混合区，空穴传输范围，有机发光器件，显示器件。

