

(19)
(12)(KR)
(A)(51) 。 Int. Cl. ⁷
H05B 33/10(11)
(43)2003 - 0004112
2003 01 14(21) 10 - 2002 - 0037877
(22) 2002 07 02

(30) 09/898,369 2001 07 03 (US)

(71) 343

(72) 14534 16
14612 42
14464 518

(74)

:

(54)

(organic light - emitting device; OLED)

OLED

1

1

2 (OLED) (hub)

3 , 2 3 - 3 2

4a 4f

4a ;

4b ;

4c ;

4d 가 ;

4e , ;

4f .

5a 5e 4a 4d

5a ;

5b ;

5c ;

5d ;

5e .

6 , 2 6 - 6 2

(hole - transporting layer; HTL) ,

7 3 가

8 ,

9 , OLED

(organic light - emitting device; OLED) ,
OLED

2 1 2

(ITO) (OLED) ,

10⁻³

1

2

2

() ,
가

()

(

) 가

(OLED) ,

(thin - film

transistor; TFT)

1

2

2

5,550,066

4,356,42

9 , 4,539,507 , 4,720,432 4,769,292 ,

OLED

가

()

(i) , 가 ;

(ii) , 1 g/cm³ ,
0.05 0.2 g/cm³ () ;

(iii) , , 10^{-6} , , 가
 , 가 , 가
 가 , - -
 가 가 ;

(iv) , / 가 , ,
 / , ,
 가 ,
 가 ,
 . OLED
 .

가 , 가 ,

(OLED)

OLED

, (a) ; (b)
 가 ; (c)
 ,

, (a) ;

(b) , 가
 ; (c) ; (d)
 ; (e)
 ; (g) 가
 , (OLED)
 .

OLED

OLED

가

" " " "

1 , 가 (OLED)(10)

(11)
(HTL)(13), (LEL)(14)

1 (12)()
(ETL)(15)

(15) , 1 (12)

2 (16)()

(18)가

OLED(10)

2 , (102) (104)
()

OLED (100) 가 (107) (106)가 (102, 104)
(108) (100)

10^{-3} 10^{-6}

(130), (LEL)
(150), 2 ()

(110), (HTL)
(140), (ETL)
(160), (102)

(105) (104) (104) (170) (103), (102) (104)
(180)

가 ,

()

(housing)

3 2 3 - 3 (110) (110) (1
10C) (110H) 1 (12)(1) (1
11) (111)가 (111) (103) (170) (1
11)가 (111) (103) (170) .

4a 4f , (500) (520) (13a) (500)
(516) (512) (514) (514) (500)
) , (520) (522) .

4a , (13a) , (522) (13b) (520)
. 가 (530) (520) 20 300 가 ,
(540) 가 , 300 80
. 가 .

4b , (524) (13a) ((13b)) (520) .
(520) (521) , (522) (523) (524) (525)
.

4c , (512) (514) , (500)
가 (13a) (13p) .

4d , (514) , (524)가 .
가 , (540) 80 20
(524) .

4e , (500) (520) , (522)가 (520)
. , (13p) (521)
.

4f , (13p) (550) .
(560) .

(500) 가 가 (520) 가 ,
가 가 가 . 20 300
(520) (13p) , (520) (524)
80 20 .

(13a) , (13p) (13)
. (13p) (13)
(1) .

2001 6 6 09/875,646 ((T
ukaram K. Hatwar) , : " Organic Light - Emitting Device Having a Color - Neutral Dopant in a H
ole - Transport Layer and/or in an Electron - Transport Layer") , OLED

4,769,292 5,294,870 (Ching W. Tang)

5 19 09/574,949 (Jianmin Shi), 2000 : "
Predoped Materials for Making an Organic Light - Emitting Device")

(522), (520), (524) ()

(, 13a) (, 13p) 300 가

(523) (525) (522) (523) (524)
(525) (523) (525) 가 , 가

5a 5e (520) (524) (522) 4a 4d
(500)

5a (13pA - 1) (13pA - 2) (13pA)

5b (13pB - 1) (13pB - 2) (13pB)

5c (13pC - 1) (13pC - 2) (13pC)

5d (13pD - 1) (13pD - 2) (13pD)

5e (13pE - 1) (13pE - 2) (13pE)

A)(5a) (13p
(5e) (13pE)
(13pE - 2)

6 , 2 6 - 6 , HTL (130) 가 (13
(130H) (130C) (11)(1) (13
1) (134) (132) (134)
(13p), 5a (13pA) (134) (245) (247)
(240) (244) (246) 가 (135) 가

가 (13v)

(11), - (200)가 ,
, 13f

(216) (200) (220) (210) (220) (13f)
 (220) (230) (226) (222) (224) (232)
 (234) (236) (240) 가

(13v) (13f) 가 (240)
 (245) (247) (220) (222) (134) 가 (135)
 (134) 가 (200) (13)(1))

가 (134) 6

, 2000 3 3
 (Robert G. Spahn))

09/518,600 (

, 2001 4 26
 09/843,489 (Steven A. Van Slyke)

6 (200)가 OLED
 , 2001 4 20
 09/839,886 (Michael A. Marcus)

OLED , 2001 4 20
 09/839,885 (

7 (CL) (710) (700) 가 (732)
 (734) (742) (740)

(710) (732) (734) , 3
 (13p) (758) (712)

(710) (712) (714) (714)
 (H)(, H (712)) 3 (L)
 (714) d l

(760) (740) , (760T) (762)

, 2001 4 26

09/843,489 (

)

, (762) ,

(700)가

()

 10^{-3}

(, 2 HTL

(130)

(130C))

, (13p)

(757a)

(757b)

가

(757)

(757F)

. 가

(712)

(710)

(714)

(CL)

(732, 734)

(712)

(vapor cloud)

(714)

(13p)

5e

(13pE)

(71

0)

가

(757)

(6 7)

OLED

4a

4f,

5a

5e,

6

7 ,

(13p)

.

1

2 OLED

(100)

(140)(

LEL)

(150)(ETL)

(14)(LEL)

(15)(ETL)

8

OLED

(800)

(810)

OLED

(812)

,

OLED

(

)

OLED

50

99%

(820)

,

, , ,

(822)

,

(

)

1.0

50%

(830)

,

OLED

(840)

,

(

)

,

가

300

가

가

가

20

(850)

,

가

80

20

(860)

(OLED)

9 OLED , 2 -

OLED (900) (902) , OLED

(904) , OLED
()

(906) , 1

(900) (905) , (915) (920)
, , , ,

(912) , 1 - (2)
50 99%

(922) , (2) 1 50%

(930) , 1 -
2

(940) , 2 (2) , 가
2 가 2 가 20 300 가 2 가

(950) , 가 , 80
20 (960)

(OLED)

, OLED OLED
가 OLED

1 ,
2

OLED

가

가

(57)

1.

(a)

;

(b)

,

가

;

(c)

,

2.

(a)

;

(b)

,

가

;

(c)

;

(d)

;

(e)

;

(f)

;

(g)

가

,

3.

(a)

;

(b)

;

(c)

;

(d)

,

가

;

(e)

4.

(a)

(b)

(c)

(d)

(e)

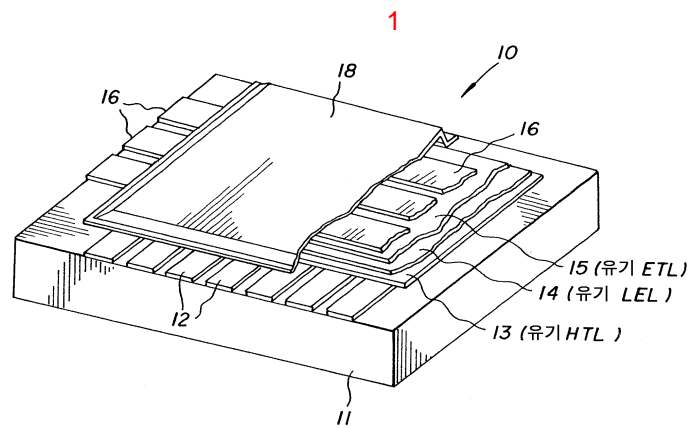
(f)

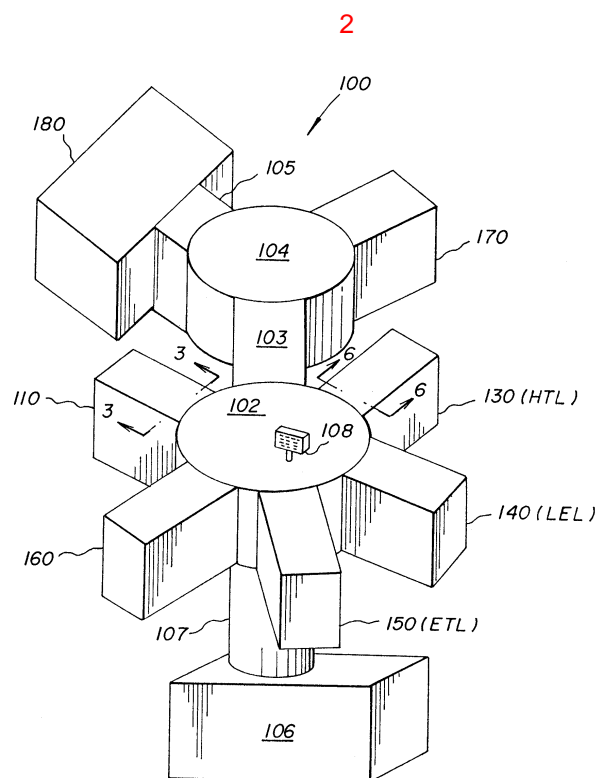
(g)

(h)

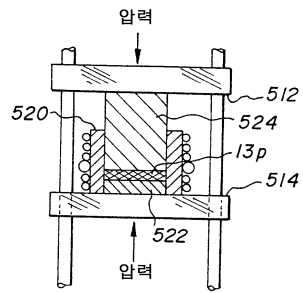
(i)

가

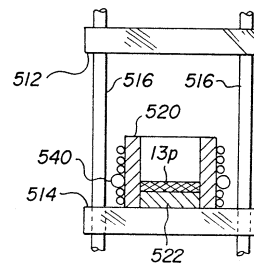




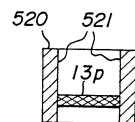
4c



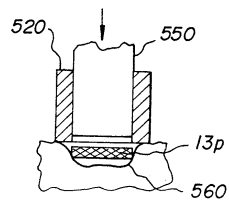
4d



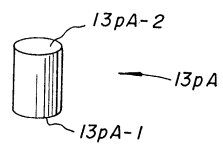
4e



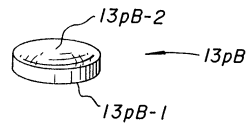
4f



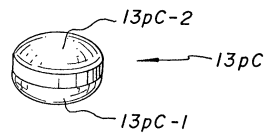
5a



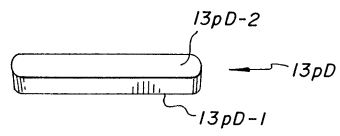
5b



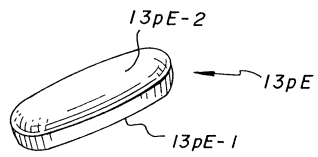
5c



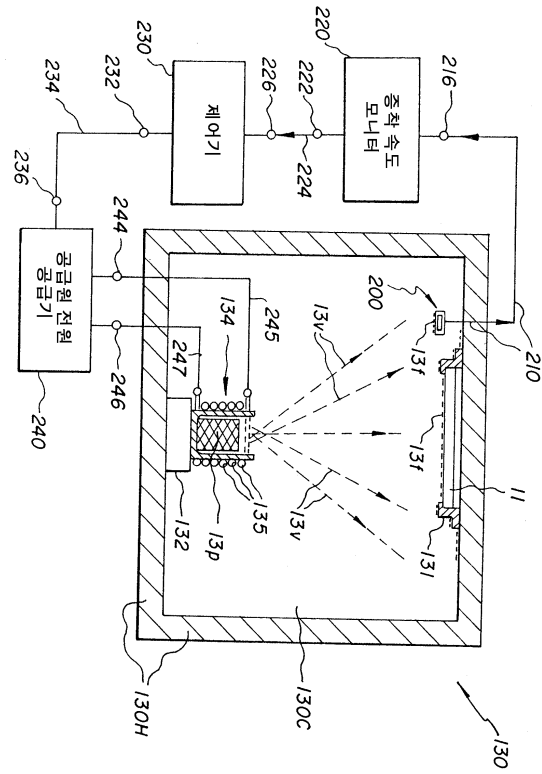
5d

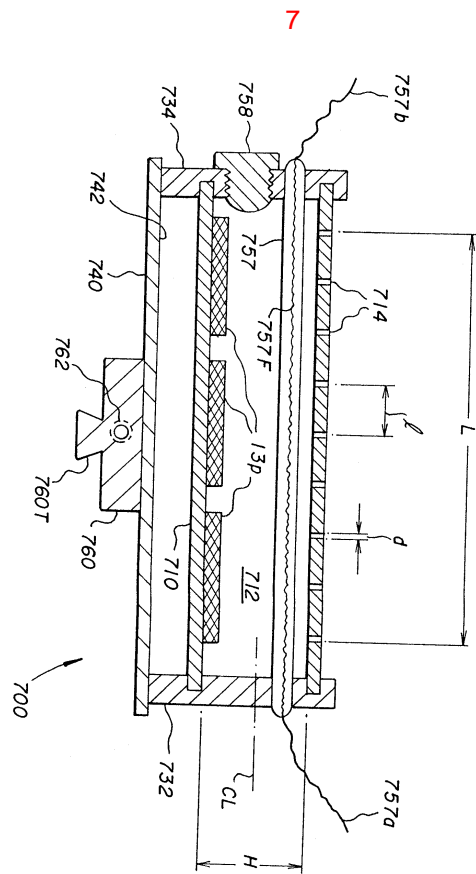


5e

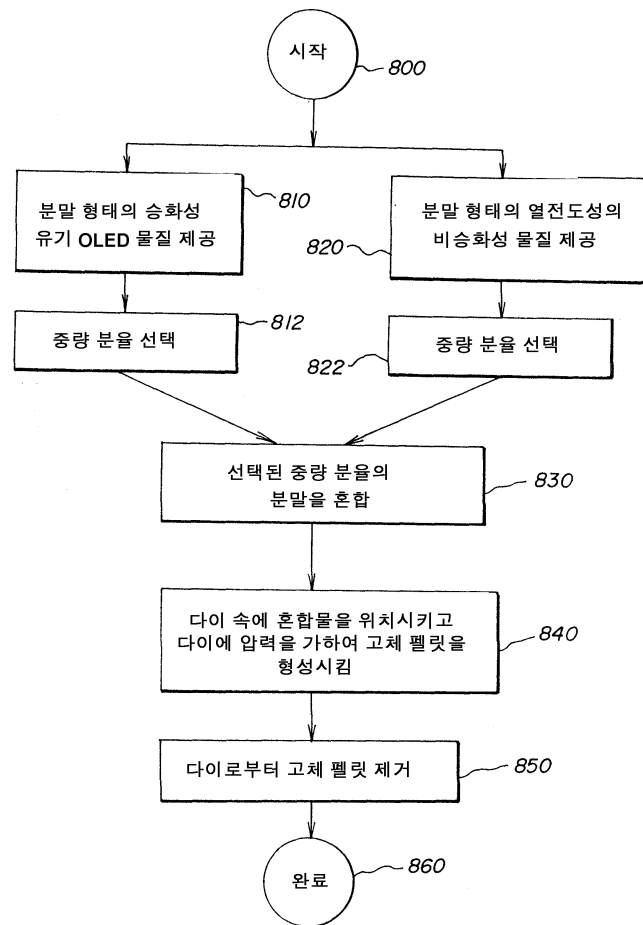


9





8



9

