

(19) (KR)
(12) (A)

(51) . Int. Cl. ⁷
H05B 33/10 (11) 2003 - 0004112
(43) 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
(hole - transporting layer; HTL)

2

,

7 3 가

,

8 ,
9 , OLED

(organic light - emitting device; OLED)
OLED

2 1 2

(ITO) 10^{-3} (OLED) , 1 . , 2 , 2

) 가 () , () , ()

transistor; TFT)	1	(OLED)	2	(thin - film
			2	5,550,066

9 , 4,539,507 , 4,720,432 4,769,292 , 4,356,42

OLED , , , 가 ()

(i) , ;
 (ii) 0.05 0.2 g/cm³, , 1 g/cm³ () ;

(iii) , , 10^{-6}

가
가
가

가

;

, ,

가
가
가

(iv) , / 가

가
.

OLED

가

가

,

(OLED)

OLED

(a)

가

; (b)

; (c)

,

(a)

;

(b)

; (c)

; (e)

; (g)

,

가

; (d)

가

; (f)

(OLED)

OLED

OLED

가

1 , (OLED)(10)
가

2 , (102) (104)
 OLED (100) 가 . (107) (106) 가 (102, 104)
 . (108) (100)
 . 10^{-3} 10^{-6} .

(13a) , (13p) (13)
(1) .
2001 6 6 09/875,646 (T
ukaram K. Hatwar) , : " Organic Light - Emitting Device Having a Color - Neutral Dopant in a Hole - Transport Layer and/or in an Electron - Transport Layer" . OLED

(Ching W. Tang)

4,769,292

5,294,870

2000

5 19

09/574,949

(Jianmin Shi),

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)
(500)

(524) (522)

4a 4d

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

가

(13v)

(11), (200) 가

, 13f

, (200) (200) (220) (200) (210) (220)
 (216) 3f) (220) (220) , (13f) (222) (224)
 (220) (230) (220) (226) (232) (240) 가
 (234) (236)

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

가 (134) 6 ,

, 2000 3 3 09/518,600 (Robert G. Spahn))

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

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

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

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

, 2001 4 26 , (762) , (700) 가 () 09/843,489 ()

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) ,
0) 偈 (757) .
(6 7) , OLED

4a 4f, 5a 5e, 6 7 ,
 (13p) .
 LEL) (150)(ETL) , (14)(LEL) (15)(ETL) 2 OLED (100) (140)(

8 OLED

(800) . (810) , OLED

(812) , OLED () . OLED
50 99% .

(820) , .
, , , .
(822) , () 1.0 50%

(830) , OLED

(840) , () , 가 20
300 가 .

(OLED)

9 OLED , 2

OLED (900) , OLED
 (904) , OLED
 (906) , 1

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

(912) , 1
 50 99% (2)

(922) , (2) 1 50%

(930) , 1
 2

2 (940) , 2 (2) 2 , 가
 가 20 300 2 가

(950) , 가 , 80
 20 (960)

(OLED)

, OLED OLED
 , 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)

가

;

(e)

;

(f)

;

(g)

;

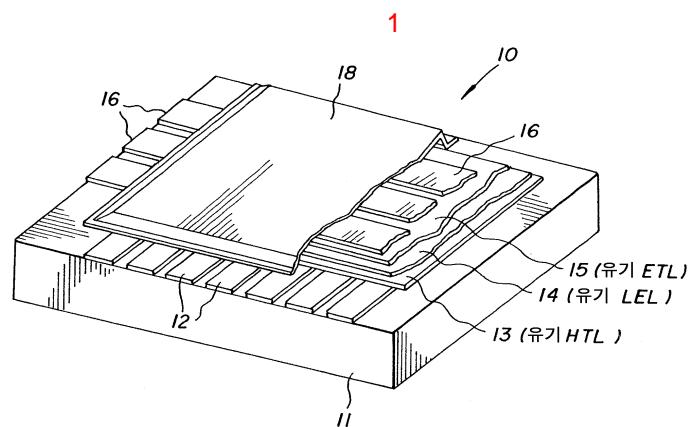
(h)

;

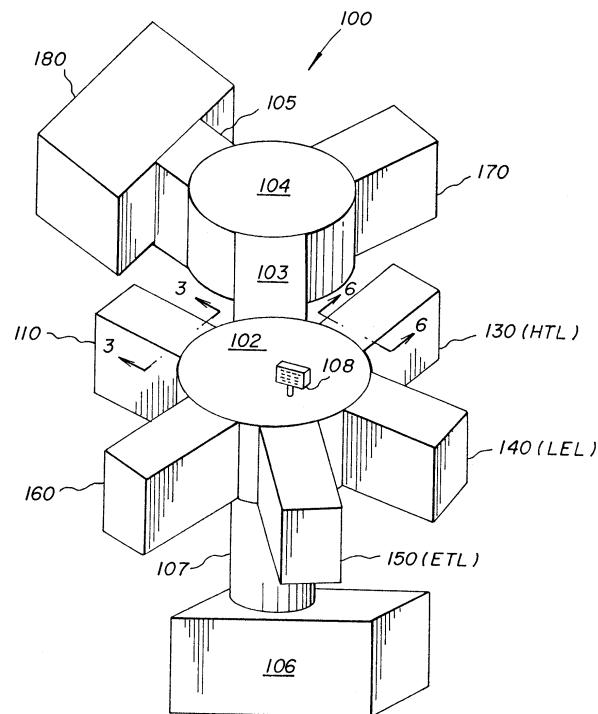
(i)

가

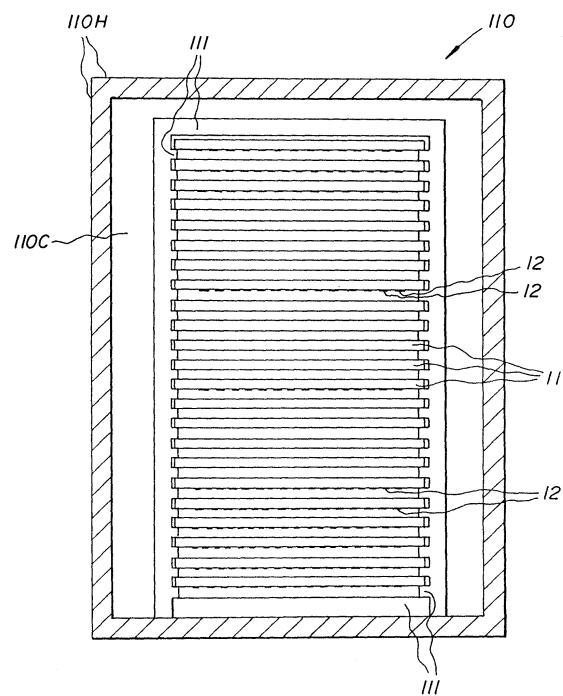
,



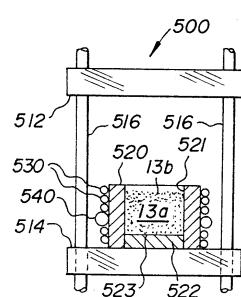
2



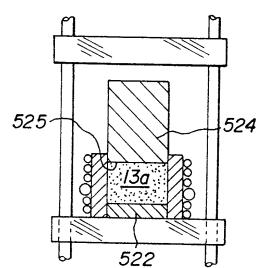
3



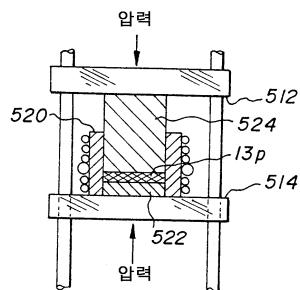
4a



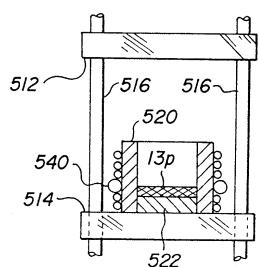
4b



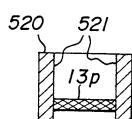
4c



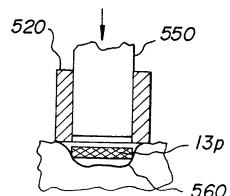
4d



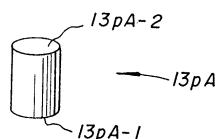
4e



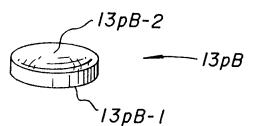
4f



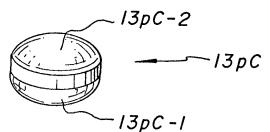
5a



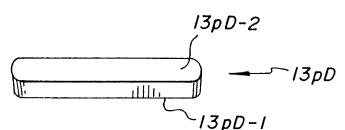
5b



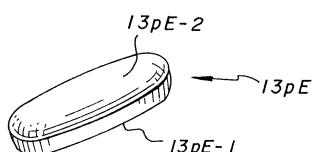
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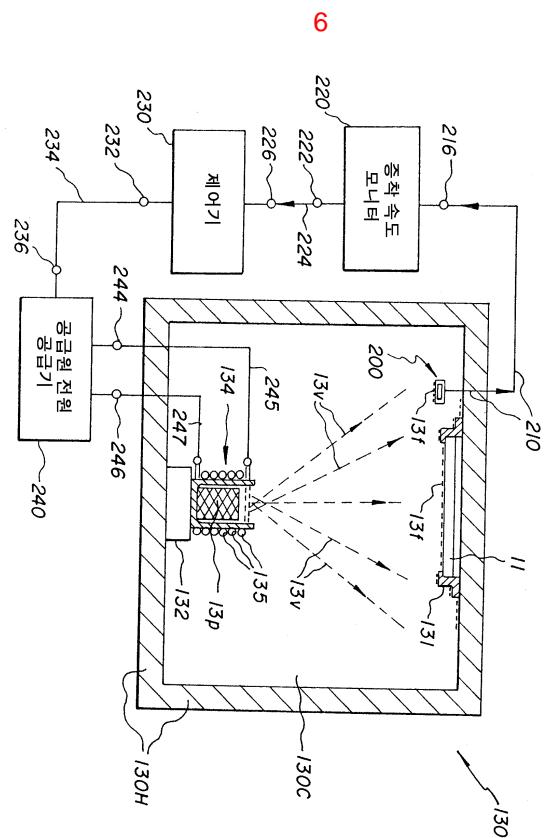


5d



5e





7

