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(71) 가 가
가 가 6 7 35

(72) 가 가 6 7 35

(74)

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(54) , ,

가 EL ,
가 ;
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1						.
2						.
3	1					.
4	2					.
5						.
6						.
7	(leak device)					.
8	1					.
9	EL					.
10			1			.
11	1				EL	
12			2			.
13	2		1			.
14	1					.
15	2		2			.
16			3			.
17	3					.
18		2				.
19						.
20	2					.
21					(gradation display characteristic)	.
22						.
*				*		
101 :	EL	102 :	TFT			

103 : 104 : TFT

가 , , 가 (electroo
ptic device) , EL (EL(
))
가 , , EL EL
EL (self lumin
ous type display) , (backlight) (visibili
ty), 가 , EL EL
EL
FT) , (; T
1 EL (, U.S. 5,684,365 8
- 234683) ()
1 (101), EL (101) (Vdd) E
L (101), TFT(102), TFT(102) (, " (grounded)")
(106) , (105) (103), TFT(102)
TFT(104)
EL 가 , EL OLED((Organic Lig
ht Emitting Diode)) , 1 OLED EL
OLED
(105) 가 ()
(Vw)가 (106) 가 , TFT(104)가 (103)
, TFT(102) (Vw)가 , (105) 가 ()
) , TFT(102) (105) , TFT(102) (103)

TFT(102) OLED(101) TFT(102) (Vgs) (105) (106)
 , OLED(101) " (writing)" , 1
 가 (Vw) , OLED(101) .

(EL) 2 , (115 - 1 115 - m)
 (,) , (114) (113)
 (112 - 1 112 - n) , M n .
 , , m , n .

가 , 가

EL , TFT TFT()
 , TFT TFT .

TFT가 , TFT가
 , , TFT (Vth) mV, 1
 V .

(Vw)가 , TFT (Vth)
 , OLED(EL) (Ids) , (Vth)
 (Ids) (μ) 가 .

(WO01/06484) 3

3 : (Vdd) OLED(121); OL
 ED(121) N TFT(122); TFT(122)
 (123); (128) (127) P TFT(124)
 ; TFT(124) N TFT(125); TFT(125)
 , TFT(122) (127) P TFT(126) .

1 : 1
 , , 3 , 가

가 (127) ()가 ,
(1w) (128) . (1w) TFT(124) TFT(125) . , Vgs TF
T(125) . TFT(125) , TFT(1
25) .

, MOS :

$$I_w = \mu_1 c_{ox1} W_1 / L_1 / 2 (V_{gs} - V_{th1})^2 \dots (1)$$

(1) V_{th1} TFT(125); $\mu 1$ TFT(125); $Cox1$ TFT(125)
 $W1$ TFT(125); $L1$ TFT(125).

FT(122) OLED(121) T (1) Vgs

$$I_{drv} = \mu^2 C_{ox}^2 W^2 / L^2 / 2 (V_{gs} - V_{th})^2 \dots (2)$$

MOS :

$$|V_{ds}| > |V_{gs} - V_t| \dots (3)$$

(2) (3) (1) . TFT(125) TFT(122)가
 $\mu_1 = \mu_2, \text{Cox1} = \text{Cox2}, \text{Vth1} = \text{Vth2}$
 (1) (2) :

$$I_{drv}/I_w = (W2/W1)/(L2/L1)... (4)$$

LED(121) 가 OLED(121) (Cox), (Vth) (Idrv) (Iw) , O ,
 , Idrv/Iw = 1, (Iw) OLED(121) 가 W2 = W1 L2 = L1 (Idrv) TFT ,

4 (N /P) 3
N TFT(122, 125) P TFT(132, 135) , 3 P TFT(124, 126) N TFT(134, 136) , 3

EL 3 4

[illegible]

(144 - 1 144 - m) (141) (144 - 1
144 - m) (145) (144 - 1 144 - m) (CS))(145)

가 , , 3 4
가 , 0 가 가 , 3 , TFT(125)
5 (145) 가 가

0 ,
3 (128) 5 ()가, ,
(144 - 1 144 - m) ,
3 TFT(125) , TFT(125)
(Vgs)가 가 ,
TFT(125) (Vth)

(, 1), , 3 TFT(122)
TFT(125) (Vth) , TFT(122)가 TFT(125)
, TFT(122) Vth (Vth) TFT(12
2) TFT(122)가

6 (A) (,
" (black floating)")
EL (contrast ratio)

(
WO01/06484) 7 (,
N TFT(129) 가 가 , 가 TFT(129) (128) (Vg)

TFT(129) (5 (145)) (Id) 가 가
(Ib) , (Vth) 가 가
가 6 (

B)

, () TFT
 가 , (lb)
 (lw) (ld) (lb)
 (streak variati
 ons))
 (lb)
 가 , 가
 TFT
 가 , 가 EL
 (gradation)
 ;
 ;
 가
 가 ;
 EL
 가
 가
 가
 가
 [1]
 8 1
 가
 TFT
 EL TFT가 EL
 EL

8, m x n (11) 3
 (11) (12-1 12-n) (13)
 11) (12-1 12-n)

(14-1 14-m) (11) (14-1
 14-m) (15) (14-1 14-m) (1)
 (14-1 14-m) (16-1 16-m)
 (17) (16) (16-1 16-m)

EL 9 EL 9
 (21) 1 (22)
 (23), (24), (25), (26) 1
 (22) (27) 2 (28) (E) 가
 (24) 1 (22) 2

(16)(16-1 16-m)

(1)

10 (16) 1 10, N TFT(31),
 (14) . P TFT(32), TFT
 (17) (33) TFT(31) TFT(32)

1 (16) 가
 (vertical blanking period) (17) TFT(32) 가
 (CS) (14) (lb) TFT(31) T
 FT(32) TFT(31)
 (15)가 (lb) (CS) (lb) 8
 (15) 가

(lb)가 TFT(31) (lb) (Vgs)
 MOS :

$$I_b = \mu C_{ox} W/L/2 (V_{gs} - V_{th})^2 \dots (5)$$

(1)

TFT(31) (Vgs) (33) (17)

, TFT(32) 가 , (33) TFT(31) (Vgs)
 , 가 , TFT(31) (33)
 , (14) , TFT(31)가 , TFT(31) (5)
 (lb)
 (5)
 , 1
 (lb)
 , 1
 . TFT(31)가 , (3) , , 가
 .
 1 가 8 (16 - 1 16 - m)
 EL 11
 , (11) , (16 - 1 16 - m) (17)
 () . , (15) (lb) (16 - 1
 16 - m) (lb) , (17) () 가 ,
 (14 - 1 140 - m)
 , (11) (12 - 1 12 - n) , 가
 , (16 - 1 16 - m) (iB)
 , 7 가 , 8 el
 가 , TFT
 가 , (16 - 1 16 - m) , 1 EL
 (brightness data)가 (14 - 1
 14 - m) (15) , 1 EL
 5
 EL
 , (11)
 (16 - 1 16 - m)
 (2)
 12 (16) 2
 12 , TFT(31) (common point) , P - TFT(34) T
 FT(31) () (14) , P - TFT(35) TFT(31)
 () . TFT (34, 35) (17)
 (33) TFT(35) , N - TFT(36) TFT(35)
 . TFT(36) (14) , 가 . TFT(31) TFT(36)
 , , 가 , ,
 2 (16) 가 , (CS)가 (lw) (17)
 , TFT(34) TFT(35) (14)

TFT(31) (Iw) (N) I1 I2 , TFT(31) (saturation region) TFT(34) TFT(31)
I2 TFT(36) , I1

TFT(31) TFT(36) TFT(35) 가 ,

$$I1 = \mu CoxW1/L1/2(Vgs - Vth)^2 \dots (6)$$

$$I2 = \mu CoxW2/L2/2(Vgs - Vth)^2 \dots (7)$$

$$Iw = I1 + I2 \dots (8)$$

TFT(31) TFT(36) 1 TFT(31) TFT(36) , T
FT(31) TFT(36) (μ), (Cox) (Vth) , T
가 .

6 8 .

$$I2 = (W2/L2)/(W1/L1+W2/L2) \cdot Iw \dots (9)$$

TFT(31) (Vgs) TFT(35) (33) , (17)
TFT(34) TFT(35) , (33) TFT(31)
(Vgs) , TFT(36) , TFT(36) 9
(I2) .

6 7 (μ), (Cox) (Vth)
2
I2 I2가 , 9
I2 Ib .

$$I2 = (W2/L2)/(W1/L1+W2/L2) \cdot Iw \dots (10)$$

(Ib) , , .

(Iw)가 10 1 (Ib) , 12
2 (Iw) (Ib)
TFT(31) TFT(36) , ,
TFT(36) , 3 , , 가

(2 1)

2 가 (17) TFT(34) TFT(35)
, 2 13 , (17A 17B;
1 2) TFT(34) TFT(35) , 14
, TFT(35) 2(17B)가 TFT(34) 1(17A) 가

, TFT(34) TFT(35) (17A 17B) TFT(34) TFT(35)가
 가 , 2 , (17) 가
 , TFT(34) 가 가 (Iw)가 TFT(31) . ,

(2 2)

2 TFT(31) TFT(31) 가 , TFT(35)가
 TFT(31) () TFT(36) , TFT(35)가 TFT(31)
 , TFT(31) , TFT(36) 가 , 15
 , 2

(3)

16 (16) 3 .
 3 , 2 1 가 , P- TFT 37가 (14) T
 FT(36) , TFT 37 (17C; 3) . 17
 , 3 1 ,
 , 1 , TFT(34) 가 , 3
 , TFT 37 가 (Iw)가 TFT(36) .
 ,

$$I_w = \mu_{Cox} W_1 / L_1 / 2 (V_{gs} - V_{th})^2 \dots (11)$$

$$I_b = \mu_{Cox} W_2 / L_2 / 2 (V_{gs} - V_{th})^2 \dots (12)$$

$$I_b = (W_2 / L_2) / (W_1 / L_1) \cdot I_w \dots (13)$$

10 (Ib) 2 1
 (Iw) , 3 (Iw)
 (Ib) ,
 3

(16) P - MOS
 , N - MOS
 ,

[2]

18 2 , 2 ,
 1 , EL 가 , TFT
 가 , TFT가 EL
 EL .

18, m × n (41) , 4
가 (41) (42 - 1 42 - n) (4
1) (42 - 1 42 - n) (43)

(44 - 1 44 - m) (41) (44 - 1
44 - m) (end) (; 45)
(45) (44 - 1 44 - m) (41)

2, (45) () (CD; 45A - 1 45A - m , 4
5B - 1 45B - m) (45A - 1 45A - m , 45B - 1 45B - m)
(sin) , (45A - 1 45A - m , 45B -
1 45B - m)

(HSCAN; 46)가 (45A - 1 45A - m , 45B - 1 45B - m)
(46) (hsp) (hck) (46)
, , (hsp) , (h
ck) () (we1 wem)
(we1 wem) (45A - 1 45
A - m , 45B - 1 45B - m)

, () (45A - 1 45A - m , 45B - 1 45B - m) 가
(45) , (45A - 1 45A - m , 45B - 1 45B - m)
(45)
, , (44 - 1 44 - m)
가 , ,

2, , (45)가
(47) (45) (45A - 1 45A - m , 45B - 1
45B - m) (44 - 1 44 - m) ()
(47A - 1 47A - m , 47B - 1 47B - m)

, , (48; 48 - 1 48 - 2) (49; 49 - 1 49 - 2)
(47A - 1 47A - m , 47B - 1 47B - m) , 19
가 (47; 47A - 1 47A - m , 47B - 1 47B - m)

19, , N - TFT 51 (44) . TFT 51 (48)
, P - TFT 52 TFT 51
2 . TFT(53) (49) , N - TFT(53) TFT 5
(54) TFT 52

(47) 10 1
(47) (47)
(16) (16)
(N /P) , 1
(47) TFT 51 (44) (47) 1
(16)

2 EL 20

(45A - 1 45A - m)
(sin))가 (45A - 1 45A - m)
(45A - 1 45A - m)
가 (bw1; 48 - 1) (bd1; 49 - 1)
(lb)가 1 (47A - 1 47A - m)

(45B - 1 45B - m)
(sin))가 (45B - 1 45B - m)
(bw2; 48 - 2) (bd2; 49 - 2)
(lb)가 1 (47A - 1 47A - m)

1 (45A - 1 45A - m)
(bd1) , , 1 (47A - 1 47A - m)
(45B - 1 45B - m) (bd2)
(47B - 1 47B - m)

(45) (lb)
(lb) TFT ()

1 (80 , (15)
(16 - 1 16 - m) (lb) (14 - 1 14 -
(16 - 1

가 (45)
(45) (lb) (16 -
(14 - 1 14 - m)
(11) (lb) 0

가 (45) (45)
(gradatio

2 (45) EL (45A - 1 45A - m 45B - 1 45B - m)
(45A - 1 45A - m 45B - 1

45B - m) (47A - 1 47A - m
 47B - 1 47B - m) , (47A - 1 47A
 - m 47B - 1 47B - m) (45A - 1 45A - m 45B - 1 45B - m)

(47) 1 1 (16)
 2 2 , 1

1 2 EL 가 8 -

21 22
 (0 - 255)

21 가 8 - , 21 가
 256(=2⁸) 가 가 0 가
 21 (y)

, 22 (Ib) 가 (21 0 , 1 2
 (15, 45) EL (Id) (Ib) (16, 47) 가 (11 41)
 (Iw) , (Iw) 22

5 EL , 가 ,
 (Iw) 21 EL (Ib) , 0 가
 (15 45) , 1 2 (0) (Ib) , 0 가
 가

, 1 2 EL , (Ib)
 가 (Ib)가 ,
 가 (Ib)

, (16 47) (Ib)가 (Ib) lb , 가 , (Iw)
 가 (11 41) (Iw)

[illegible]

(57)

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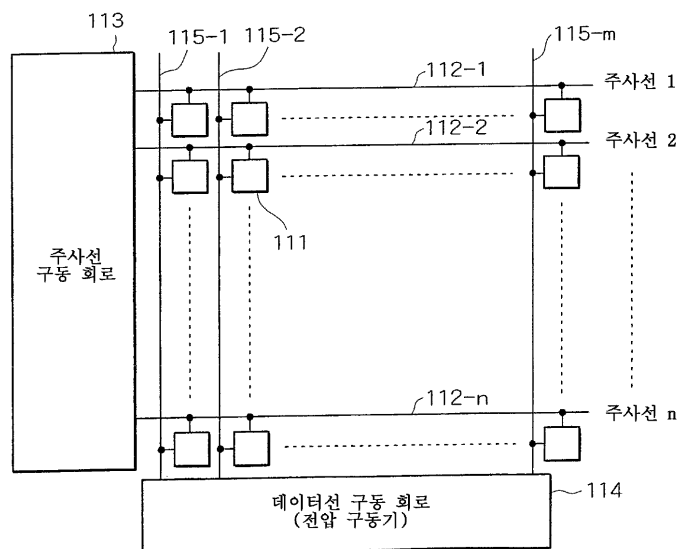
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17.

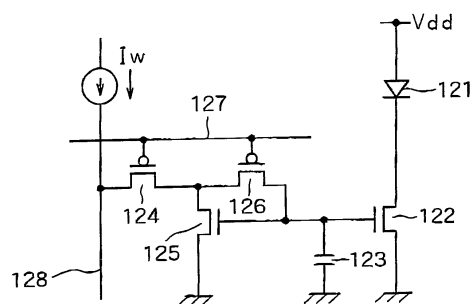
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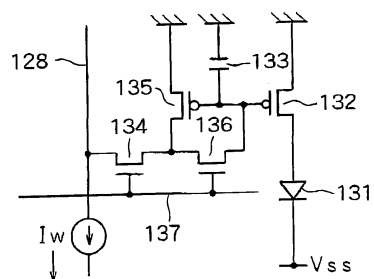
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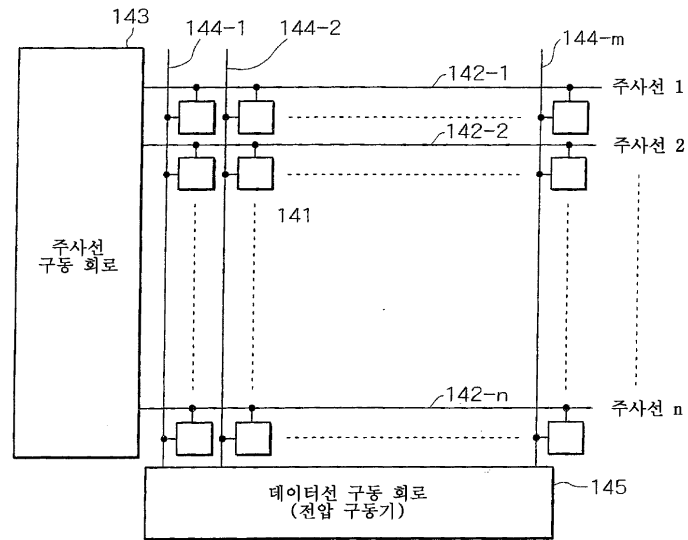
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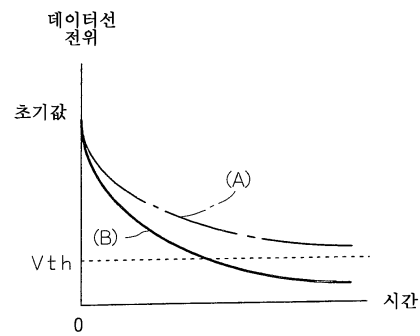
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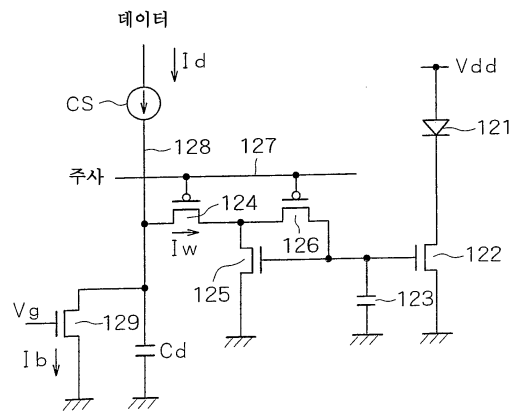
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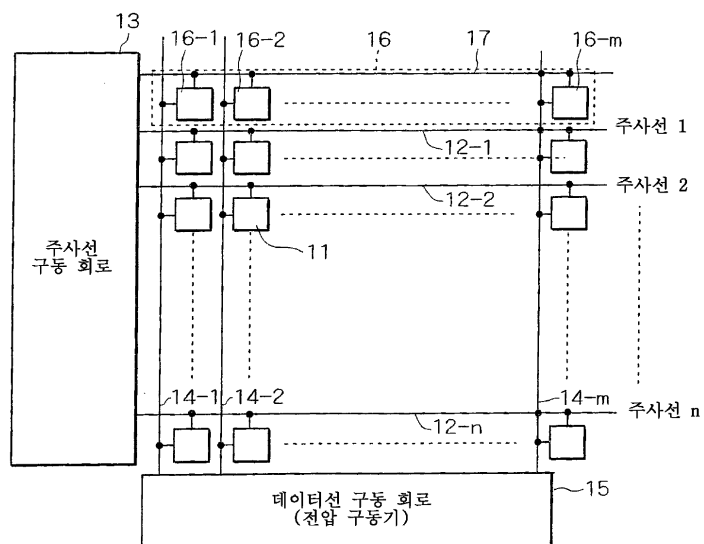
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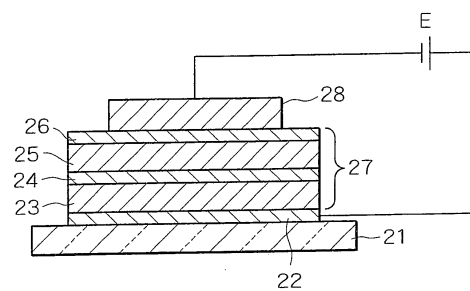
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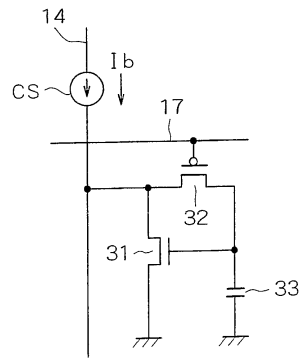
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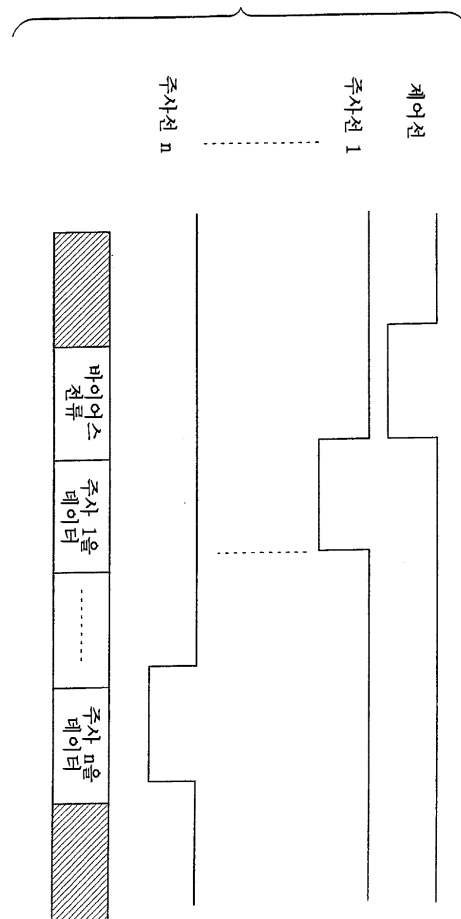
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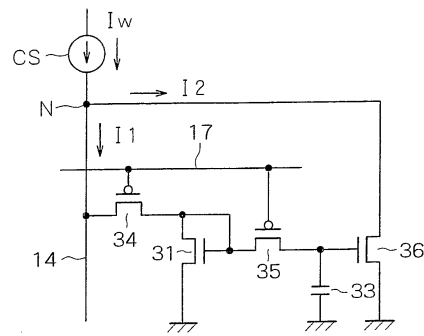
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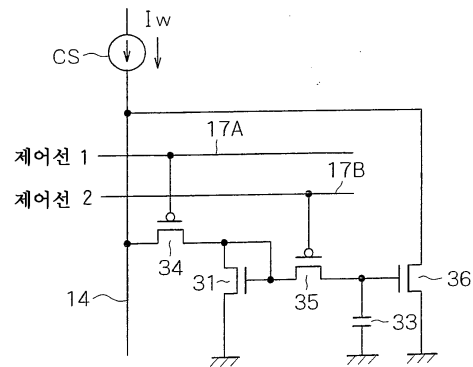
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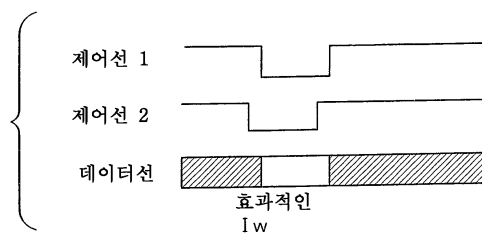
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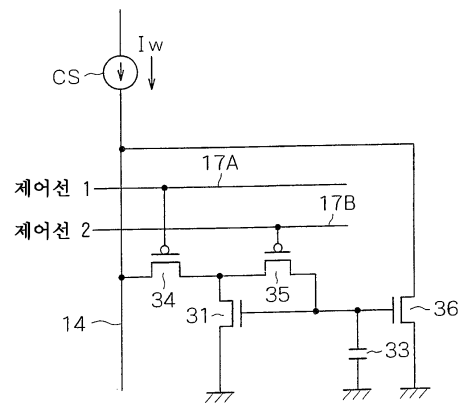
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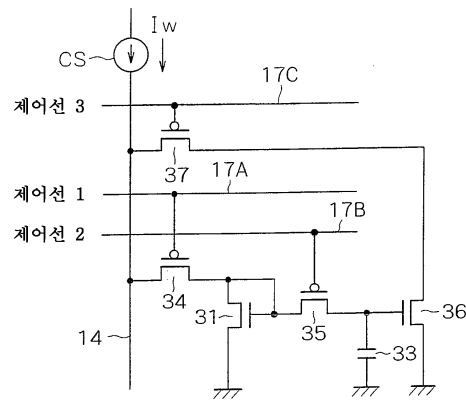
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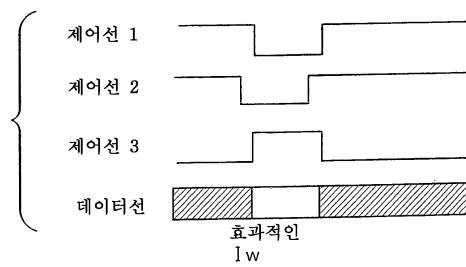
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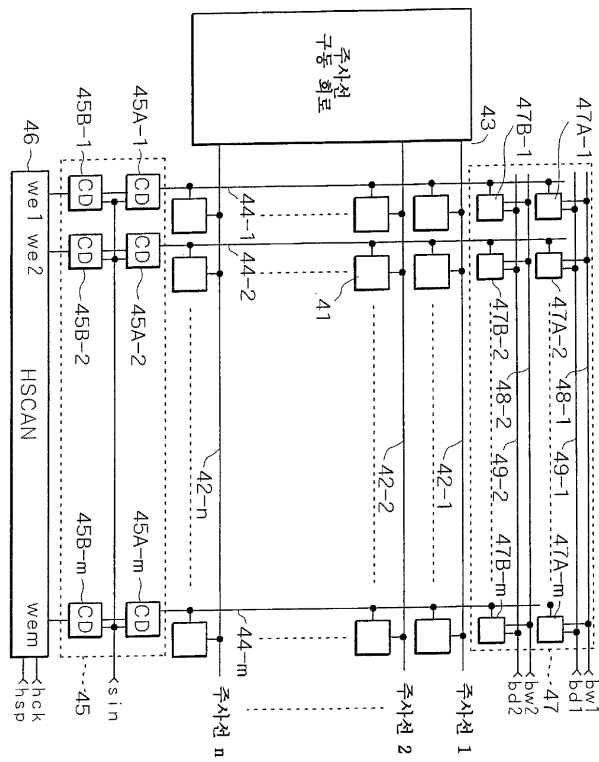
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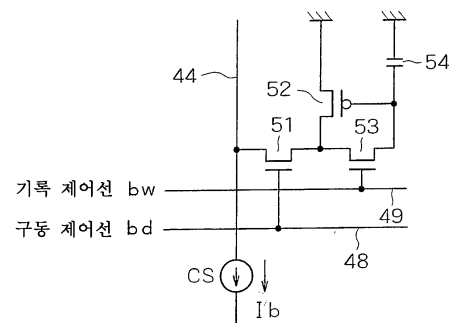
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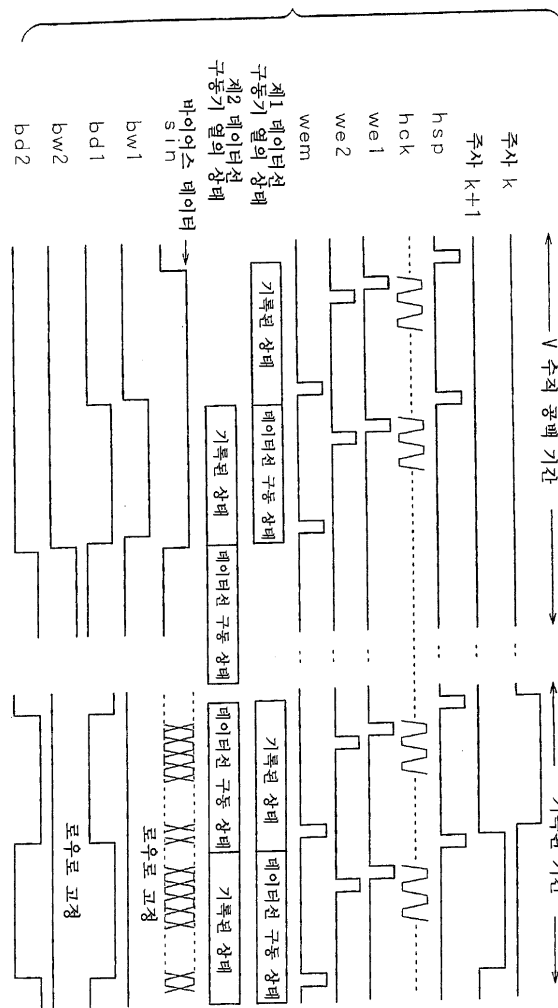
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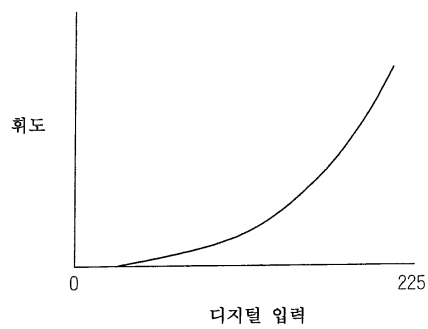
19



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