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(JP)  
(JP)

(71) 가 가

1 5 1

(72) 1 5 1 가 가

1 5 1

1 5 1 가 가

1 5 1 가 가

(74)

:

(54)

(11) ITO, FTO  
(13)

(12)  
(13)

(12)

(12) , , (12)

(13)

1

(增感)

2001-400593 (2001 12 28 )

1

1

11

(11)

1 5mm

(11)  
가 0.2 1 $\mu$ m

(11)  
, FTO( 가  
, CVD

(12)

(12) ITO(

(12)

(13)가

(13)

12)

(12)

2

3

2

(13)

450 2000 $\mu$ m, 가

2000 20000 $\mu$ m  
(15)

10 1000 $\mu$ m

(14),(14)...가

(16)

3  
5)...가

(13)  
450 2000 $\mu$ m  
(16)

10 1000 $\mu$ m  
(14),(14)...가

(15),(1

(13)

(15)

1 20 $\mu$ m,

3 10 $\mu$ m

2가

(13)

90 99%가

(15)

1

0.01 / 가

ITO, FTO

(12)

(13) 가

( 1/10 1/100 )

(13)

(12)

(13)

(13)

90 99%

가



6 8  
7  
9 가 0.1 $\mu$ m 8  
10 1, 2, 3, 4, 6, 7, 8, 9  
11 10

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12

( 1)

1 1 3 (13)

(13) 가 (13) 가

(13) , , . (13) (12)

, , , 가 . , , , 가 , (13) 가 . (13) (13) (製膜) (13)

(13) 가 120 550 , 150 450 , 5 120 , 10 90 가 55 0 가 120 (11) 가 . 5 120 가 55

가 500nm 가 10 500nm가 가 10nm 가

4 4 21 1 3 (21) (13) (22) . (22) 가 5 50 $\mu$ m . (22) 4 (13) (14),(14)... (3)

(22) (13) 300 800 5 50nm (22) 가 . (23) (23a) (23b) (23b)

가 . (23) (23a) p 가 (23) (23b) p 가 (23)

(23)

(21)

(22)

(24)

가 / , / 가

(24) p 1가 p 가 가

(12) (13)가 (13)가 가

(13)가

(13) 가

( 2)

5 2 5 1 3

1) (31) 1 3 (12) (3) (13)가

(31) (13) (12) (13) 가 (12) FTO , ITO FTO , , ( )

(31) (3) 0.005 0.2μm, 0.01 0.03μm가 (12) (31) 0.005μm 가 가 (31) 가 0.2μm (31) (31) 0.01 0.03μm가 (13) (31) (12) FTO , , ( )

6 (11) ITO, FTO (12) ( ) ( ) (32)

(32) (33) (12) (33) (31)

(31) , 7 (13)

(34)

8 (34) (13)가 (31) (35) (31)

), ( ) (浴)(

(34) , 가 (13)가 (35) (35) (31) (33)

5

35) (35) (34) 가 (31) ( ) (FTO /FTO

1/6 가

/ ( 1/5 )

(12) (35) 가 (31)

(12) (31) (12) (13) (35)

(35) (34) 가 (31) 가

(12) , (12) (35) (13)가 (35) (35) (31) (35) (12)

(12) FTO , 가

(13) (31) (12)

5 (31) (13)가 (11) (12) (31)

2 (12) (11) (31) (12) (13)가 (13)

(12) (12) 가 가 (12) (前面) (13)가 (12) (13)

(12) (12) (31) (12) (12)

(13) (11) (12)

(13)가 (12) (12) 가 (13)가

(12) (31) (13) (12)

5 (12) (31) (31) 1 (

13) FTO (12) (31) (13) (

(12) FTO (12) (13) (12)

(13) (31) (31)

( 1)

1 1

2mm 0.5 $\mu$ m FTO

FTO 2 FTO

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
12. FTO
13. FTO

5 $\mu$ m, 40 $\mu$ m, 860 $\mu$ m, 가 5000 $\mu$ m 95%

0.1 0.8 / , 550nm 75 80% .



2.0mm ( , , , , ) 500nm FTO )  
 가 . 120 450 , 5 120 가  
 A B  
 -1 +1V 가  
 +0.5V 가  
 A B x 가 ,  
 1/10 가  
 가 , 2 6 .

< 2>

Ni							
		5	10	30	60	90	120
	120	x	x	x	x	x	
	150	x					
	200						
	300						
	450						

< 3>

Cr							
		5	10	30	60	90	120
	120	x	x	x	x	x	
	150	x	x				
	200	x					
	300						
	450						

< 4>

Co							
		5	10	30	60	90	120
	120	x	x	x	x	x	x
	150	x	x	x	x	x	x
	200	x	x	x	x	x	
	300	x	x				

450						
-----	--	--	--	--	--	--

< 5 >

Al							
		5	10	30	60	90	120
	120	x	x	x	x	x	
	150						
	200						
	300						
	450						

< 6 >

Ti							
		5	10	30	60	90	120
	120	x	x	x			
	150	x					
	200						
	300						
	450						

120 450 , 5 120

가

2 6  
00nm

가

가 10nm,

가

50nm,

가

1

가

( 3 )

3

2

2mm  
( ) ( )

0.5 $\mu$ m FTO

(

FTO

0.05 $\mu$ m

0.025 $\mu$ m

450

2  
0 , 30 , 60 , 120

5 $\mu$ m, 40 $\mu$ m, 860 $\mu$ m, 가 5000 $\mu$ m 95%

0.1 / , 550nm 75 80%

20nm 15 $\mu$ m 400 1 가

2mm / 5 $\mu$ m FTO

10mm $\times$ 10mm

-1V +1V

9 11

9

가 가

500mV

10

가 가

500mV

11

가 가

12

12

가

가

가

FTO

가

가

(57)

1.

가

2.

1 , , , 2

3.

1 2 , 가 10 5  
00nm

4.

1 3 ,

5.

, 120 550 가

6.

가

7.

가

8.

6 7 , , ,

9.

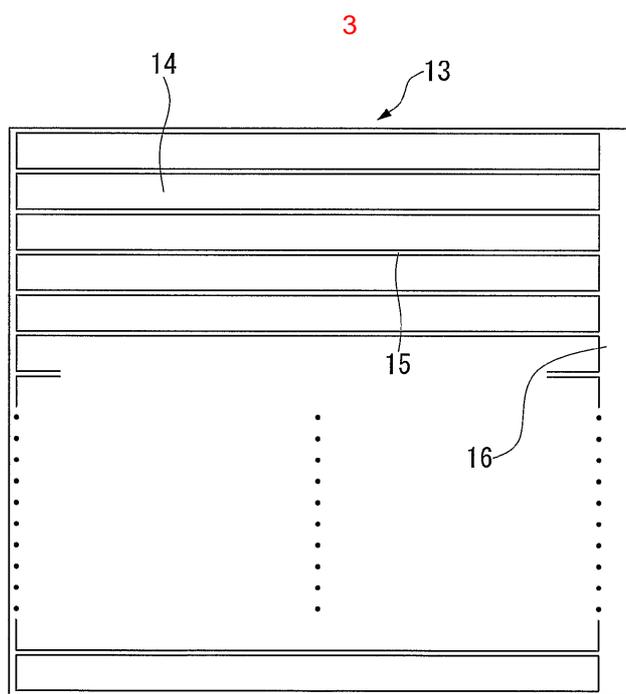
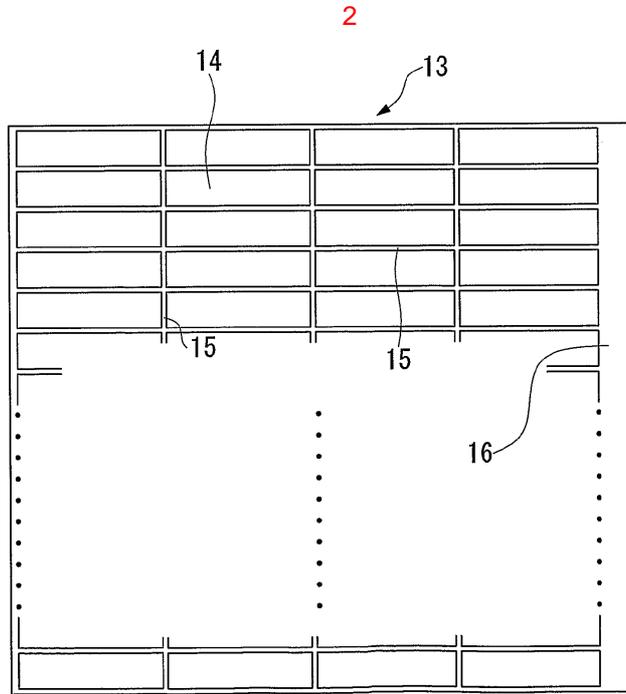
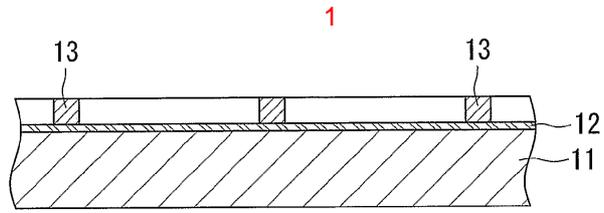
8 , 가 0.1 $\mu$ m

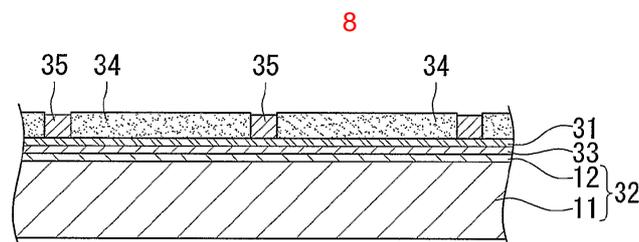
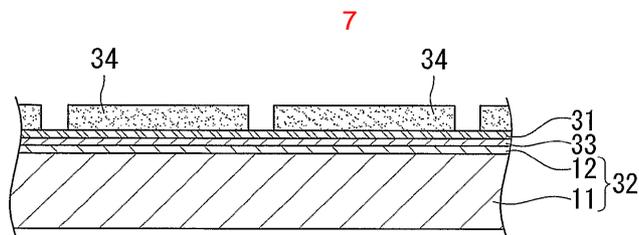
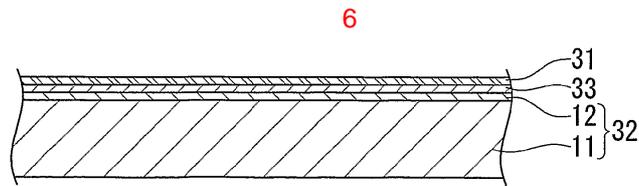
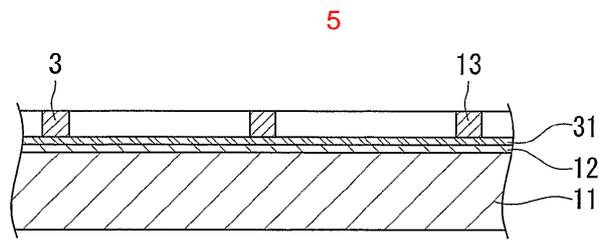
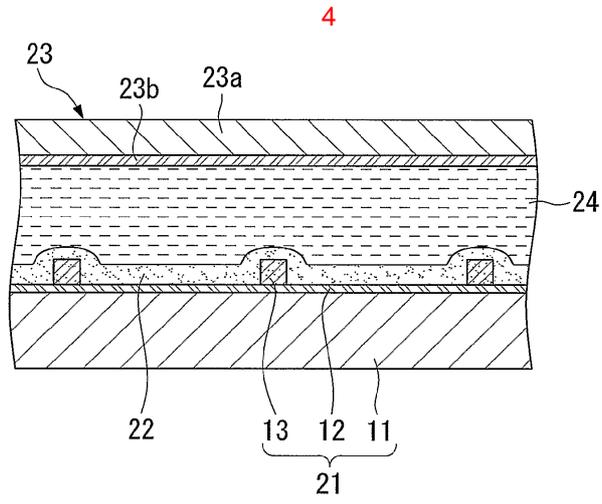
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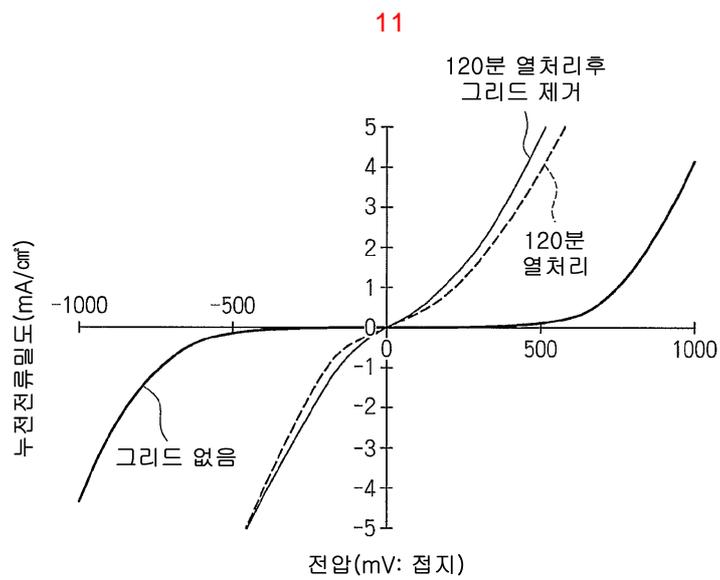
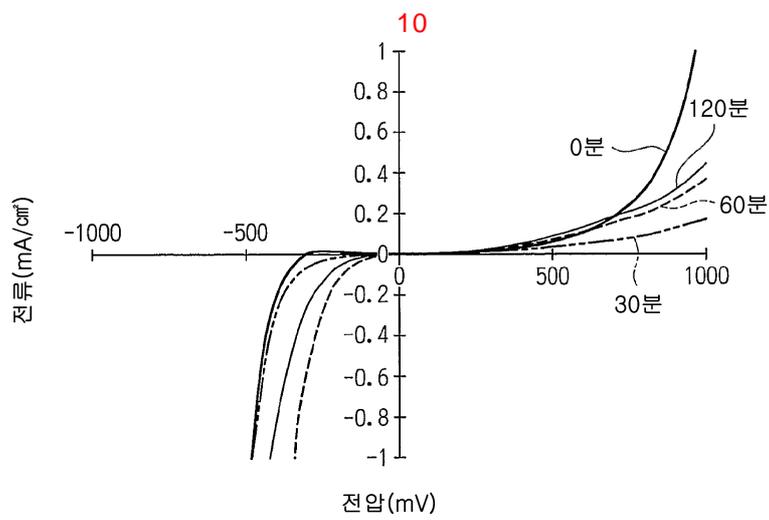
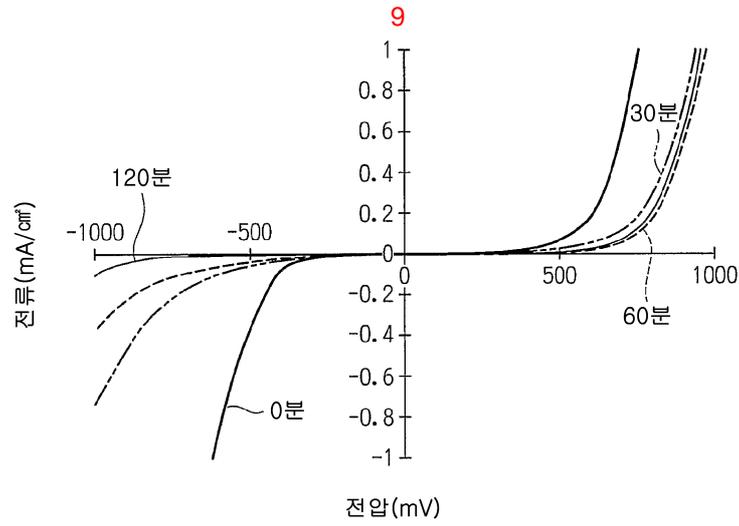
1, 2, 3, 4, 6, 7, 8, 9

11.

10 ,







12

