

(19) (KR)  
(12) (B1)

(51) 。 Int. Cl. <sup>6</sup> (45) 2002 05 09  
H01L 27/108 (11) 10 - 0310565  
 (24) 2001 09 18

(21) 10 - 1997 - 0048682 (65) 1998 - 0069965  
(22) 1997 09 25 (43) 1998 10 26

(30) 97-044094 1997 02 27 (JP)

(73) 가 가

2 2 3

(72) 2 - 2 - 3 가 가

(74)

(54)

20

1 20 1 DRAM

21 40 DRAM

1 : 4 :

5 : , ( 1 )

8 : , ( 1 )

9 :

10a, 10b, 10c, 10d : / ( )

11 : 11a : (side wall)

14 : , ( 2 )

15 : 18 : , (18),

19 : , 20 :

21 : 24 :

25 : 26 :

A : B :

가

,  
 (SAC : Self Alligned Contact)  
 (劣化) 가 DRAM  
 (自己整合的)

SAC , 0.3 $\mu$ m DRAM  
 21 40 DRAM

(2) 21 , (1)  
 , CVD 500 , (3) 100  
 (3)

, 22 (3) 3000 (4)  
 , (3) A ,  
 B

10<sup>20</sup> /cm<sup>3</sup> (5) 90 (P) 5x  
 7) CVD 500 (phosphorus - doped polysilicon) (6) (WSi<sub>2</sub>)  
 CVD (27) 1000 (27)  
 (1) , SAC (stopper) , 22  
 23 , (27) , (27)  
 (8) 0.3μm (8)  
 (5) (8)  
 13 /cm<sup>2</sup> (4) (4) (熒) 1x10  
 c, 10d) , MOS / , n- / (10a, 10b, 10  
 / (10b)  
 24 , CVD (11) 800 (11) LDD  
 (side wall)  
 25 W1 800 (8) (11a)  
 / (5) ,  
 (10a, 10b)  
 26 (4) (11a) A (12) , 5x10<sup>15</sup> /cm<sup>2</sup> (8),  
 S / , n<sup>+</sup> / (13) MO  
 , A (12) , n<sup>+</sup> / , A n<sup>+</sup>  
 /  
 27 , A (12) CVD (14) ( , BPSG  
 ) 4000  
 , TEOS  
 SAC  
 28 (14) 850 (8) 20 SAC BPSG (14) (sag)  
 6000 , t1  
 29 A / (10a) , B (10c) , (anisotropic oxide film - dry etching) , 0.  
 3μm / (15) , 30% 9000 BPSG (27) 250  
 BPSG 1/20 , / (10a) t2  
 t2

30	,	(8)	가	,	(16)	,	(WSi <sub>2</sub> )(17)
		(18) CVD					
	,			(18)	W2 0.3 0.5μm	,	DRAM
	,		(15)	/	(10a, 10c)	.	
31	,	CVD	3000			(19)	.
32	,				/ (10b)	,	0.3μm (1
0b)	.		(20)	.	(	,	)
33	,	$5 \times 10^{20}$ /cm <sup>3</sup>			7000	CVD	,
	(21)	W3	(21)			(21)	.
,	(21)		(20)		A n /	가 0.25μm	.
34	,	CVD		(22)	,	(	(cell
plate)	) (23)		$5 \times 10^{20}$ /cm <sup>3</sup>			60 /1000	(23)
	.				A		
35	,	CVD	BPSG	5000		(24)	.
36	,		(14)	가	,	850	30
(24)	.						
37	,		(18)	,	B / (25a)	(10d)	,
B	(8)			0.3 0.4μm	(27)	.	(27)
B	,	B	(8)			(25b)	.
38	,	(27)		.			.
39	,			(25b)		(27)	,
(8)	.			.			,
40	,		(26)	5000		(25a, 25b)	,
					0.4μm	(26)	.
SAC		DRAM			25	(11a)	,
	,		A	,	(20)	,	(21)
가	/	(10b)		,			.
,	B	,	(8)	,	(27)	,	(10d)
(18)		(25a)			(8)		,
					(25b)		.

, SAC

2

2

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MOS

/

( 1 )



9	,	850	20	SAC	, BPSG	(sag)
00	가	.	(8)	.	t1	60
10	,	(14)	.	.	t1	.
,	/	0.3μm	(10a)	,	A	(8)
,	(11)	.	(15)	B	/	(14)
,	(11)	.	(14)	.	A	(10a)
t2가	.	.	BPSG	1/20	30%	9000
.	.	.	.	.	,	BPSG
.	.	.	.	.	,	(11) 250
11	,	A	/	(10a)	,	(15)
(5)	(11)	(5)	.	.	/	,
.	.	.	.	.	.	(10a)
12	,	(8)	가	,	$5 \times 10^{20}$ /cm <sup>3</sup>	(16)
(WSi <sub>2</sub> )(17)	CVD	500	.	,	(18)(18)	.
,	DRAM	.	,	(15)	/	W2 0.3 0.5μm
.	.	.	.	.	.	(10a, 10c)
13	,	CVD	3000	.	.	.
.	.	.	.	.	.	.
14	,	(10b)	,	(19)	A	(16)
(8)	,	/	(5)	14)	,	.
,	.	.	(20)	(11)	,	0.
3μm	.	.	.	.	/	.
.	.	.	.	.	.	.
,	14	,	(20)	(8)	(11)	가
.	,	(8)	(11)	10	(15)	.
,	(8)	.	SAC	.	.	.
15	,	(P)	$5 \times 10^{20}$ /cm <sup>3</sup>	.	7000	CVD
가	,	(20)	,	.	.	.
n <sup>-</sup>	/	(21)	.	(21)	W3	(21)
0.25μm	.	.	,	(21)	(20)	A
.	.	.	.	.	.	.
16	,	CVD	.	(22)	(23)	5 × 1
0 <sup>20</sup> /cm <sup>3</sup>	,	.	(23)	,	,	.
.	,	A	60	/1000	(23)	.
가	.	.	.	.	(23)	.
.	.	.	.	.	.	.
17	,	CVD	BPSG	5000	(24)	.
.	.	.	.	.	.	.
18	,	(14)	가	850	30	.
(24)	.	.	.	.	.	.

19 , B , , , , / (10d) ,  
 (8) , (18) , , 0.3 0.4  $\mu$ m (25) . ,  
 (8) (9) , , (9, 14, 19, 24) ,  
 (25) .

$$20, \quad (26) \quad 5000 \quad (25), \quad ,$$

$$0.4 \quad 0.5 \mu\text{m} \quad (26) \quad .$$

, A / (10b), 14  
(11) , , , , , ,  
· · · · · · · ·  
(25) 가 (8)

19 (25) 가

, DRAM 20

$$\begin{array}{ccccccccc} A & & & & (9) & & (8) & & \\ (11) & & & & . & & (11) & & (14)(-2) \end{array}$$

, (10a), (14), (8), (11), (10a), (18), (5), (11), (8), (5)가 .

, (10b) , (8) , (8) (11) , (14) , (5) (11) , (5) (10b) (21) )가 .

, (14) (18), (19) (21)가, (22) (24), (26) (23)가,

, B, (8)(1) (11a) (14)(2) (9) (11a) . (11a)

$$, \quad (8) \quad , \quad (14) \quad (9) \quad (8)$$

가 .

(57)

1.

1

1

1

1

1

1

2

1

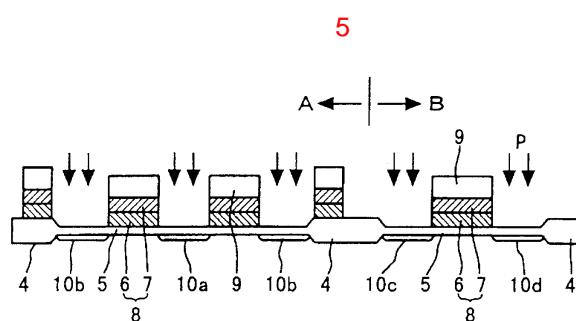
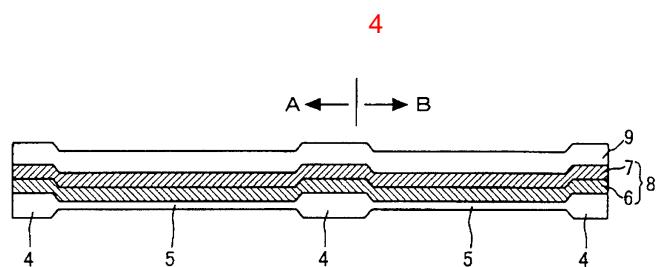
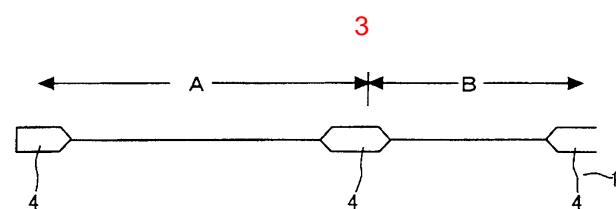
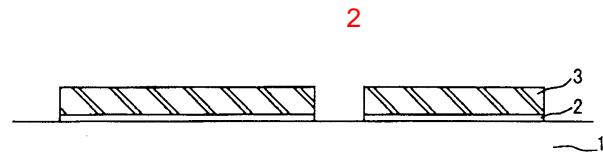
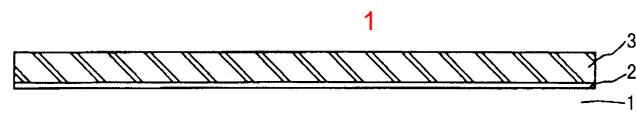
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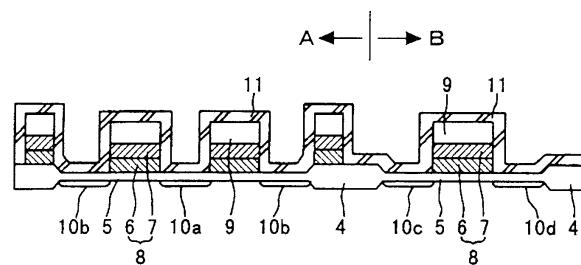
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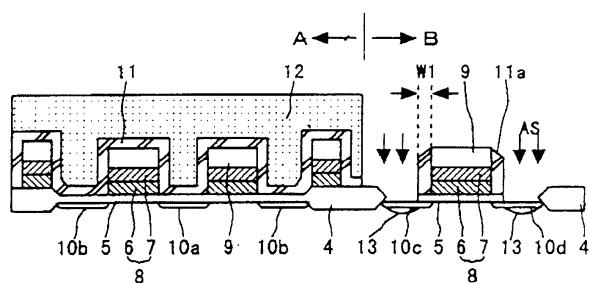




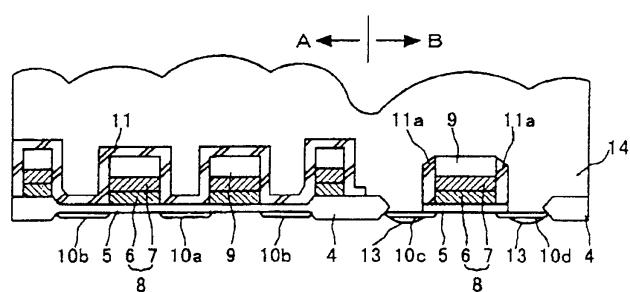
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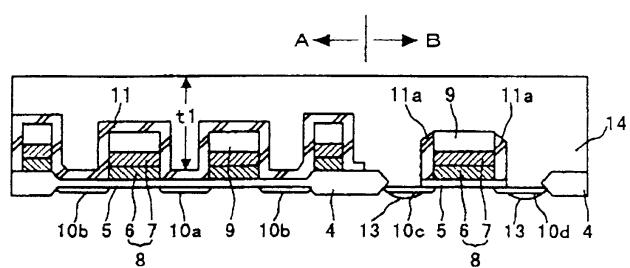
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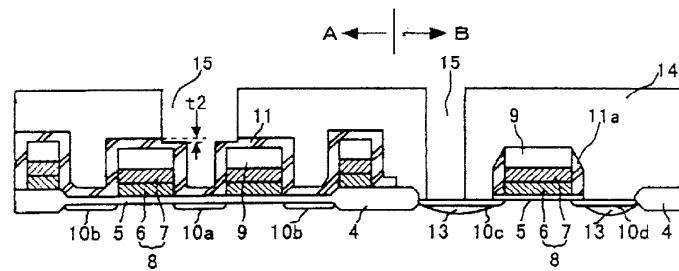
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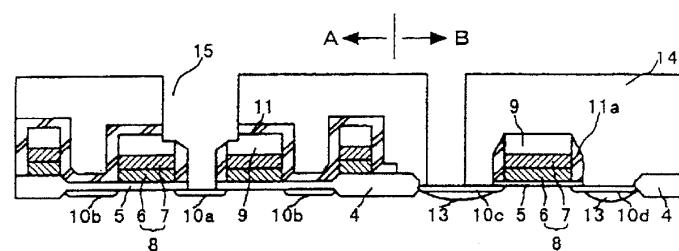
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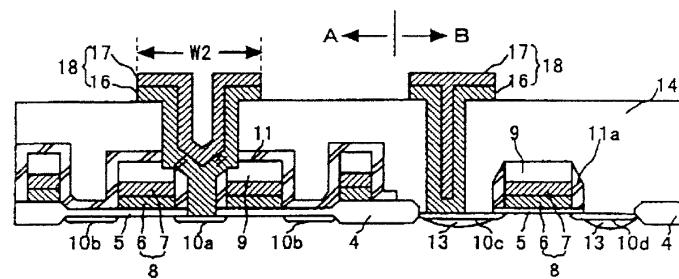
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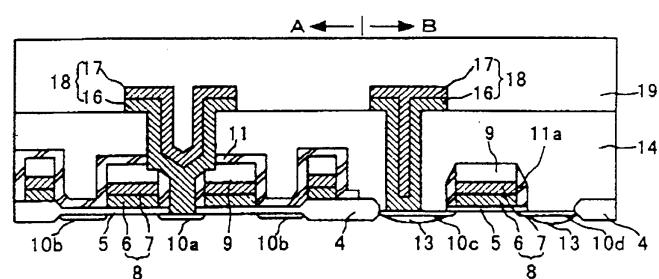
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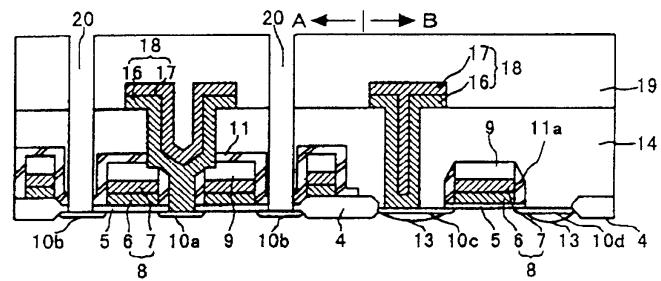
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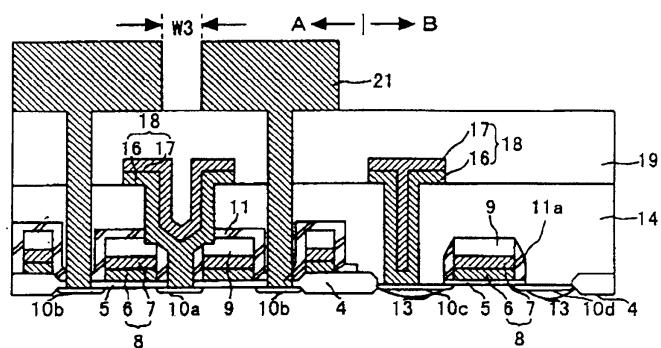
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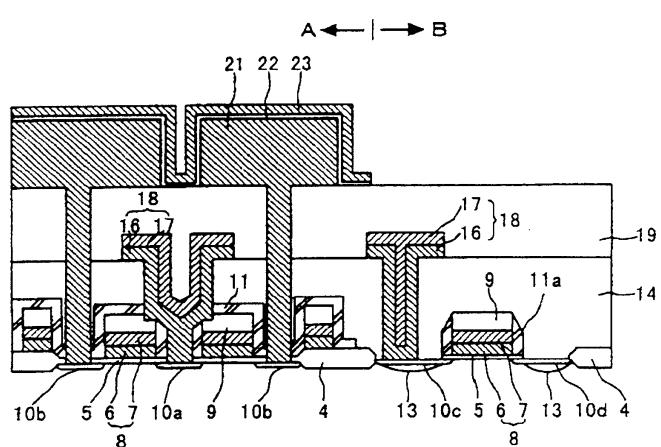
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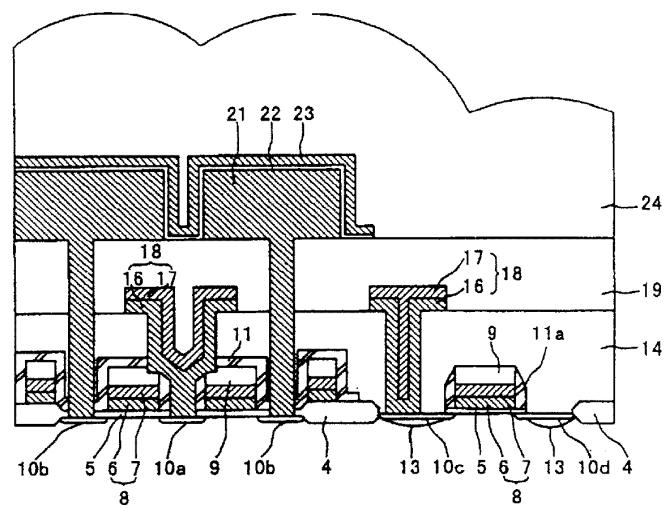


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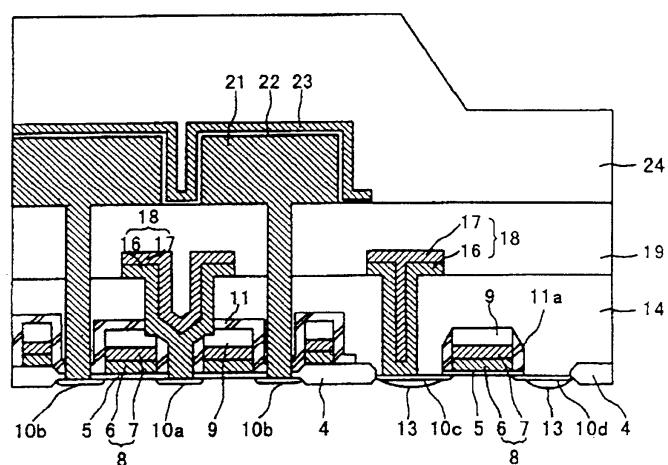
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A ← | → B

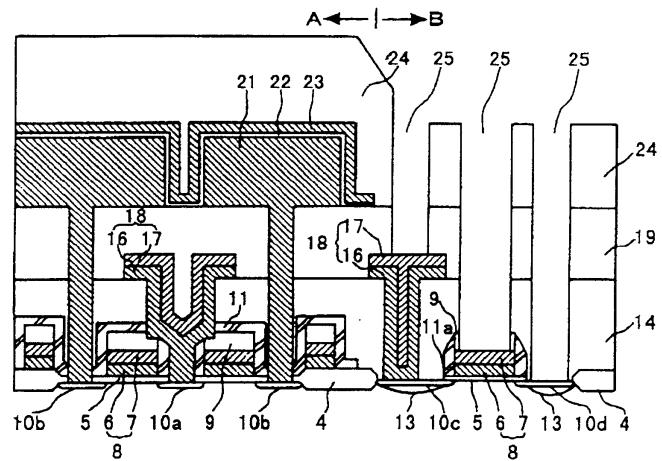


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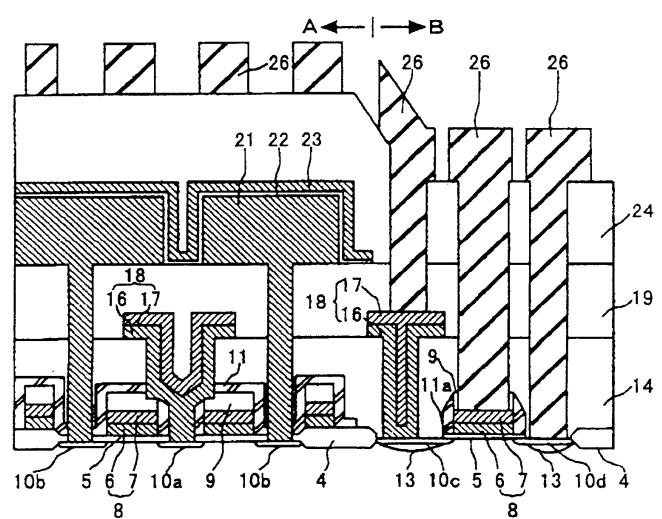
A ← | → B



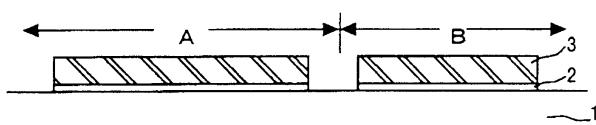
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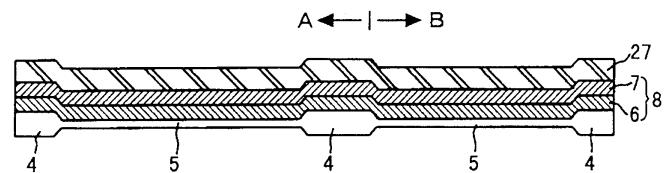
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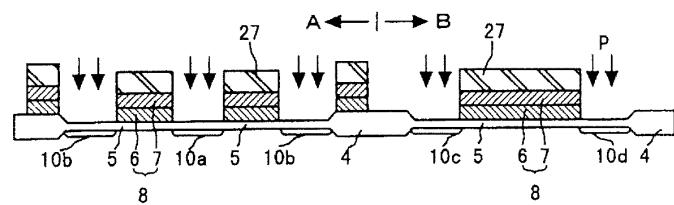
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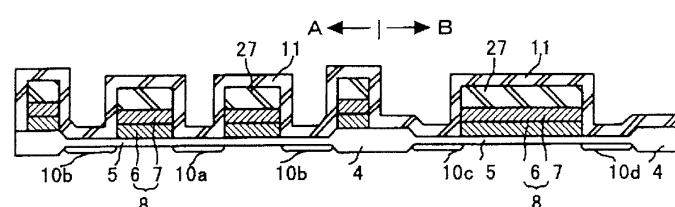
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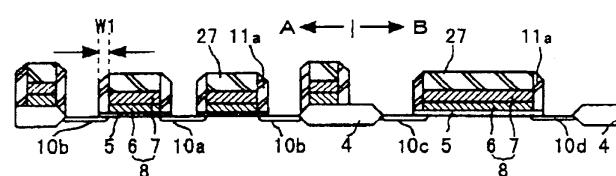
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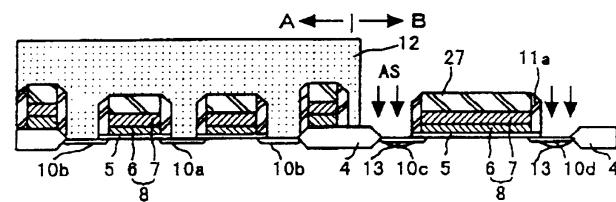
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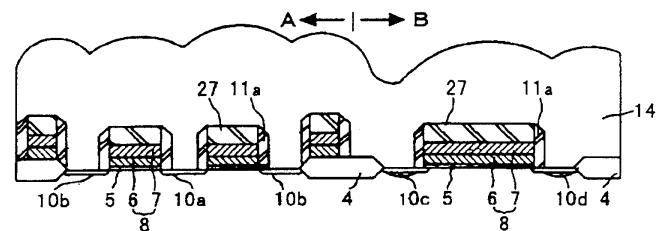
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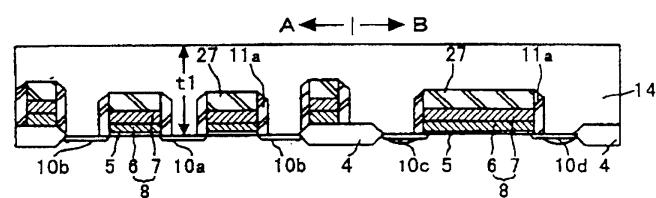
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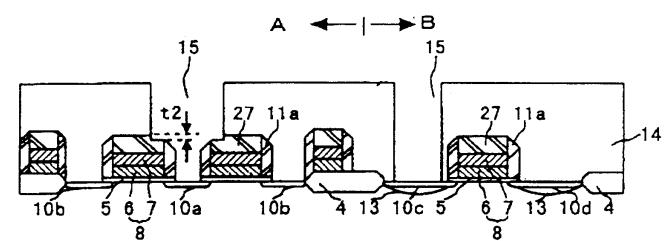
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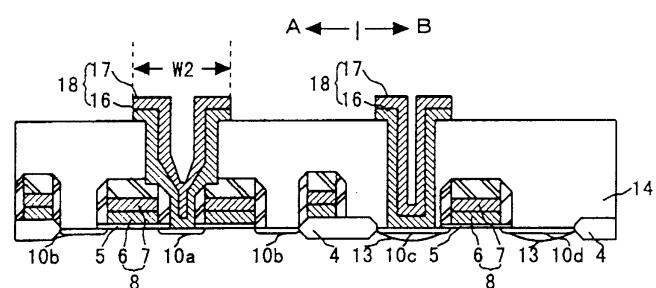
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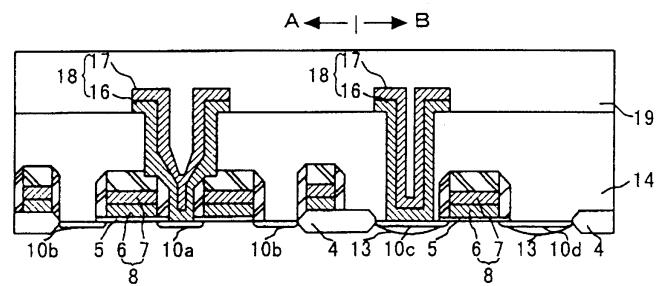
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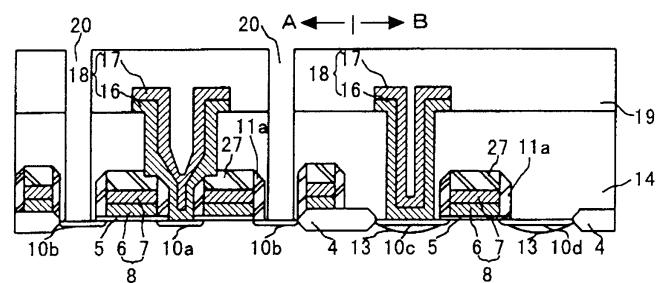
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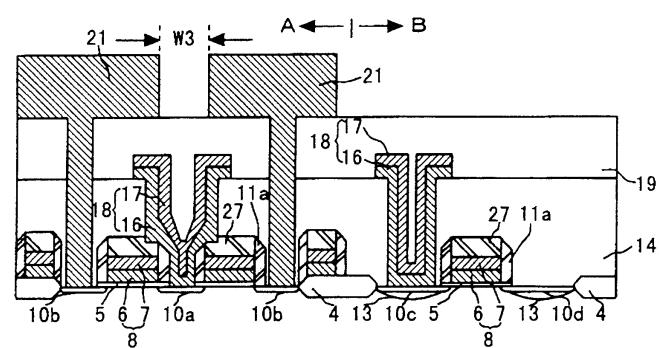
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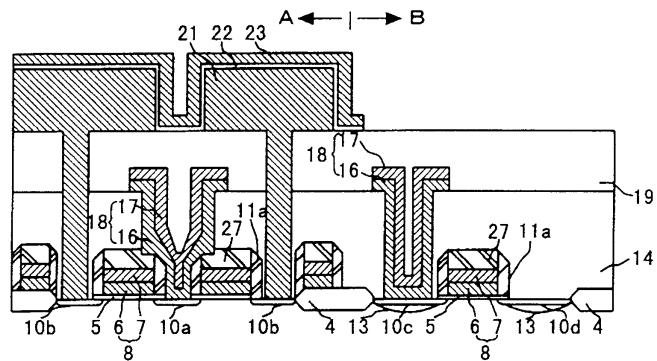
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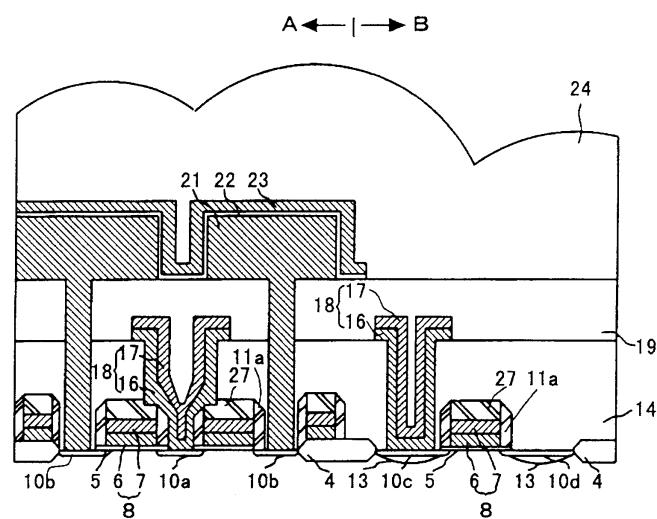
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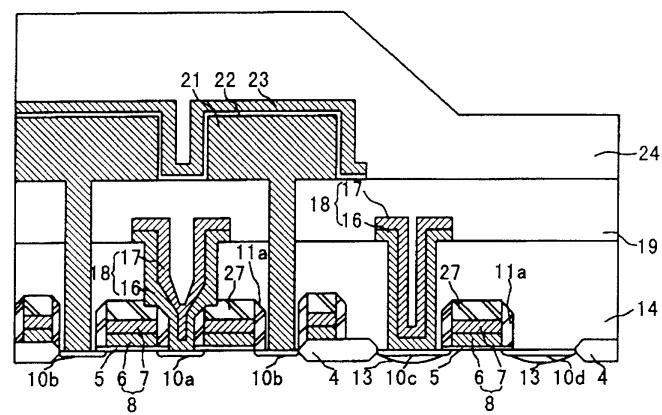


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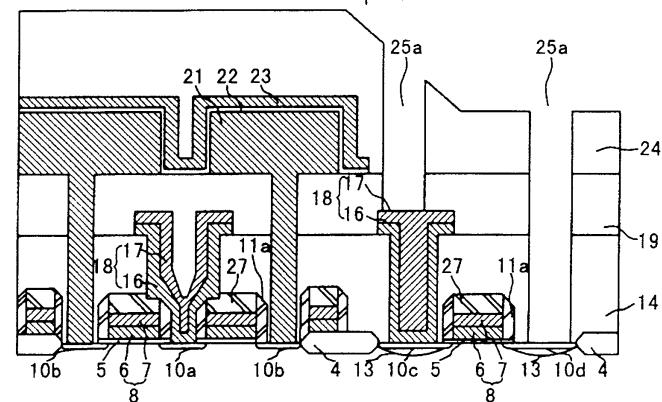
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A ← | → B

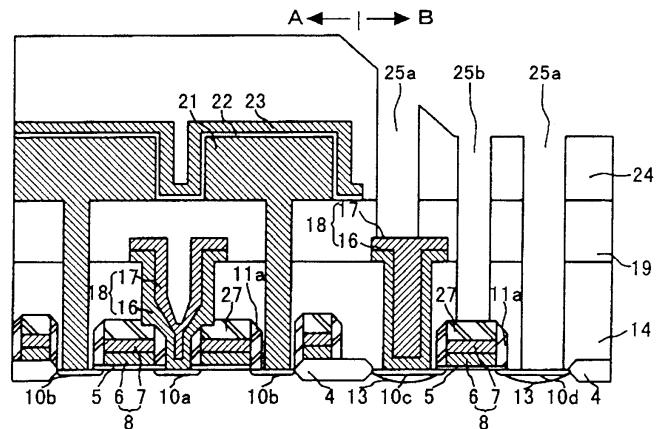


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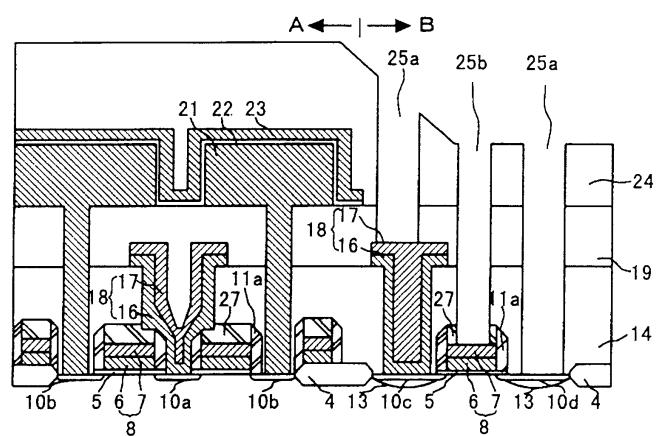
A ← | → B



38



39



40

$$A \longleftrightarrow B$$

