

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl. <sup>7</sup>  
H01L 21/027

(45)  
(11)  
(24)

2002 05 31  
10 - 0339140  
2002 05 21

(21) 10 - 2000 - 0022196  
(22) 2000 04 26

(65)  
(43)

2001 - 0014831  
2001 02 26

(30) 11 - 122443 1999 04 28 (JP)

(73)

, - , - 1 - , 32 - 1

(72)

, 179 - 0071, - , - 1 - , 32 - 1,  
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, 179 - 0071, - , - 1 - , 32 - 1,  
, 179 - 0071, - , - 1 - , 32 - 1,  
, 179 - 0071, - , - 1 - , 32 - 1,

(74)

:

(54)

가  
(irradiated)

(joints)

1

1

2

3a 3b

4a 4b 1 2 (aperture array)

5

6

7

8 1 (4), 2 (5), (9)

9a 9d

10a 10b

11

<

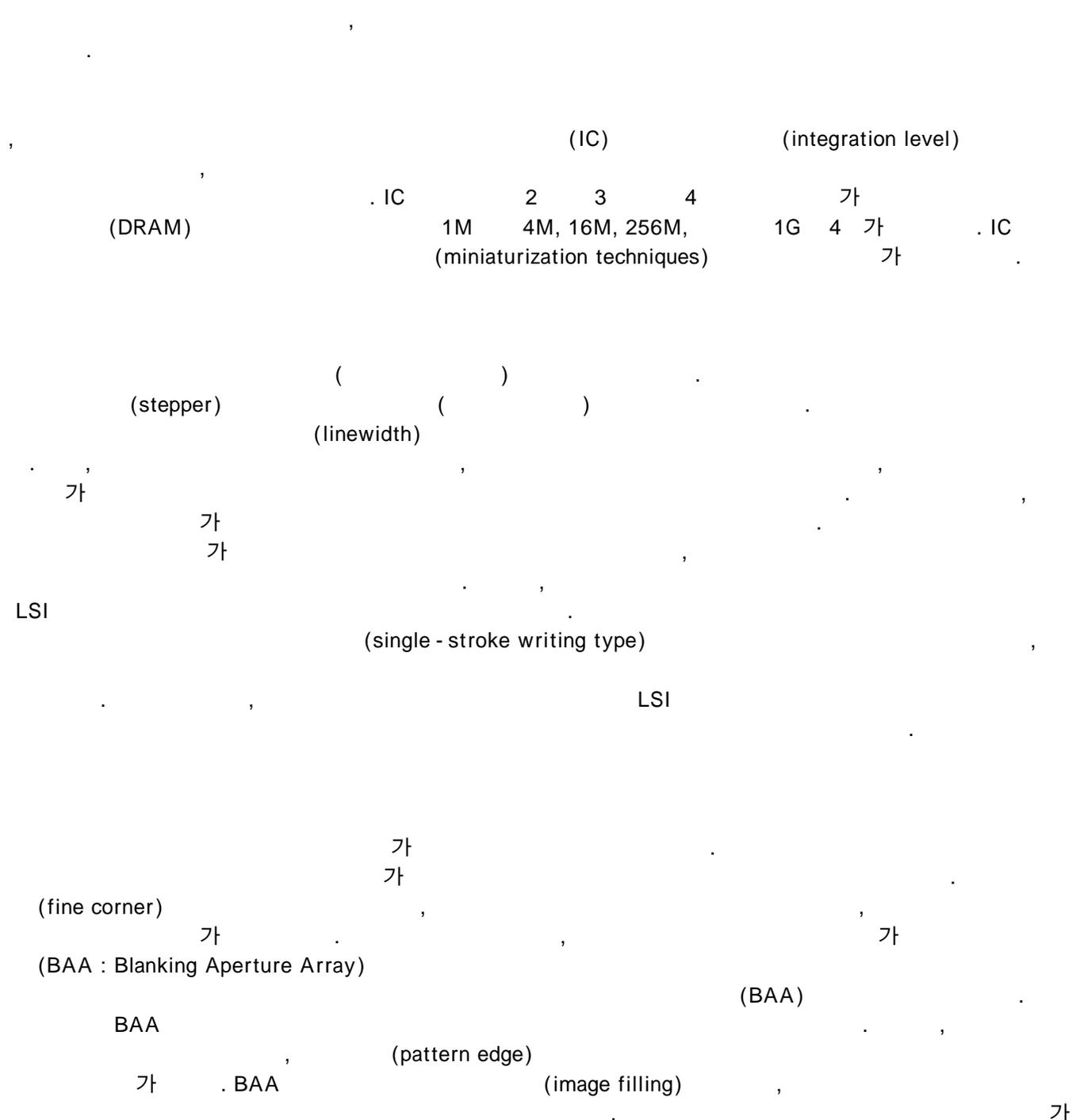
1 : 10 - 1 10 - 9 :

12 : 13 :

28 : 29 :

30 : 31 :

32 : 36 :





(T. R. Groves and R. A. Kendall) , . 가  
B16(6){J. Vac. Sci. Technol. B16(6)}(1998 , 11/12 , 3168 - 3173 ) ,가  
( ) , ,가

(10 - 128795)

가

가

가

가

가

가  
가

가

가

가

.BAA

가

.BAA

BAA

가

가

가

가

가

가

,가

가

가

가

가

가 (a redundancy)  
가 (a quantity of dose)

(blanker means)  
가

가 1 가  
가 1  
2 가 2  
2 1 2  
1 2

(shield electrodes)  
가 90°

가 90°

가

가

1  
가 , 가 가 . , 1 ,  
가 , 가  
.

, , ,  
. , , 가 가 , 가 ,  
.

1 , . , 가  
.

가 , (가 )

,  
X Y  
16 , 4 4  
4 ,

가 , 가  
.

가

, 가 , ,  
가 ,

1 2 1  
3a 3b

1 , (1) , 3 1 , 4 1 , 5 2

, 6 2 , 7 , 8 (iris), 9  
 , 10 - 1 10 - 9 , 11 , 12 , 13 , 14 /  
 , 15 , 16 (clamping) (15)  
 , 17 , 18 , 19 , 20 , 21 , 22 /  
 , 23 , 24 , 25 , 26 2 , 27 1 , 28 ,  
 29 , 30 , 31 , 32 , 33 , 34 , 35  
 , 36 . , (1) (15) 가

(15), (16),

(2 - 1 2 - 8) (10 - 1 10 - 8) 2 3a 3b (1)  
 (3) (2 - 1) 1 (3) 1

(4) (2 - 2) (4) 가 1 (3) 1  
 (9) 2 (5), 2 (6), (7),  
 (z ) x y (4) 1 (3)

3a 1 (4 - 1) (5) 2 (5)  
 , 3b (2 - 3) 2 (4) (5) 2 (5)

가 1 (4) (5) 가  
 2 (6)가 3a 1 (4 - 1)  
 1 (4 - 1) 3b (5 - 2) 2

(4 - 1) 가 가 3b 1  
 x y 가 가 가

(2 - 4) (7) (7)

3a (7) (8) 3b

(2 - 5) (15) (9) (9)

3a 3b (15) (9)

2 - 8) 가 가 (2 - 6, 2 - 7, (15)

4a 4b 1 2 (3 6) 4a (41)  
 가 (square aperture) (42)  
 (41) , 20 × 20, 400 가 , 가 15μm  
 (square) 가 60μm , 60:1 가 (15)  
 가 , 0.25μm (square shape)  
 (15) 가 1.0μm

, 5 × 5, 25 (41) (42)가  
 (41) 1 (3)  
 가 (41) 가 (41)

4b (41)  
 (43) (Si) , 44 , 46 , 47  
 (42) (41)

5 1 (4), 2 (5), (7), (9)  
 가 (50) (50) , 가  
 (51) (41)  
 (52) (51) 가  
 , 53 GND

6 (51) (56)  
 (42) (56) (53)  
 (54) , (55) , 20 × 2  
 0, 400 (56) 가 60μm (56) 25μm ,  
 (42)

7 (57)  
 (53), (54) , 가  
 (55) 가  
 가 가  
 (50) 가 가 (50)

(56)  
 (42) (58) 가 , (42)  
 (56)

5 가 , (52) GND (53) (51) (53)  
 (54) (51) (52)  
 GND (53)

(7) 5 7 (50)  
 (5), (9) , (50) (4), 2 ,  
 1 (50)

8 1 (4), 2 (5), (9)

8 (50) (50)  
 (51) , (56) (53), (54),  
 (55) (52) GND (53'),  
 (50') (51') , (56') (53'),  
 (54'), (55') (52') GND  
 (56)가 (56') (50 50')

(53) (54) (53') (54') 90°  
 (53 54) 가 , (53' 54') 가 , (61 61')  
 가 , (56 56') , x y 90°

(56 56') x y  
 (50) 가 , 90°

(9), (7) , 1 (4), 2 (5),  
 (magnification ratio)가 1 (3)

가 , 1 (4), 2 (5),  
 (9) (7) (50)



9c (75) 1 (73) ( 36 ) 2  
 (13), (36), (12) 2 (75) ,  
 (9) 2 (75)  
 2 (75) 1 (73) 9b  
 1 (73) (74)

9d (13) 가 2 (75) ( 16 ) 3  
 (9) 3 (77) (36)  
 (13) 가 3 (77) (77)  
 2 (75) 9c 3 (77)  
 (76) 2 (75)

10a 10b 3 (77) 가 (79)  
 (9) 20 × 20 = 400  
 3 (77) 400 4 (82) 0.25μm (square) 1.0μm  
 16 5 (36) 10b 5 (83)  
 (9) , 400 5 (83)  
 10b 16 5 가 5 (83) (36)  
 3 (77) , 4 (82)  
 (36) 4 × 4 5 (83), { 2 (75)  
 } (13) 1/80

(79) 1 (4) 2 (5)  
 (81) (80) (79)  
 (9) 4  
 가

(12) 가 2 (75) 1 (73)  
 3 (77) (36) 3 (77) 4

(82) 5 (83) 가 ,  
 , 1 (4) 2 (5)  
 (9) , (36)  
 5 (83) , 3 (77)  
 16 (13) 3 (77)  
 (12) 2 2 (75) 16 , 1  
 (73) (73) 36 (75) , 1  
 (73) Y , x  
 (15)

가 (1) (10 - 1 10 - 9) (28)  
 , (12), (13), (36)가 ,  
 가 (6) (41) (3) 2 가  
 1 (3), 2 (6), 1 (4), 2  
 (5), (7), (9), (8) (jig)  
 / (14) 가 가 (1  
 8), (36)

(22), (23), (20), (21), /  
 (26), 1 (24), (25), 2  
 (27), (28)  
 (29) (30) "LSI" " " 9a 9d 10a  
 " 10b

(11)가 ,  
 (15) (16) (16)가 (12) (13) , (11)  
 9a 9d 10a 10b (36) 가

(14) (blurring) 가 가 /  
 가 가  
 가

, 10a (3,1) (m,1) 4 (5,1)  
 , (m,1) (m,1) (m,1) (3,1)  
 (m,1) (5,1) 400  
 , 400 5 (83) (36), (13), (12)  
 (15) , 가 가  
 , (50) (53) (54) 7  
 , 가 가 가 (57) 1/4  
 , 1/16 , 11 , 7 1/6 , 1/36  
 , (79) (36) (12) (36) (13) 가 (13)  
 , (79) (79) 10a (9) 가  
 , 가 3 , 10b (77)  
 , (79) 가  
 가 , 가  
 가 가 , 가 가

, 가

가

, , ,

가 .

LSI

LSI가 가

(57)

1.

,  
,  
,  
(irradiation position)

2.

1 , , .

3.

2 ,  
(blanker means)

4.

2 , .

5.

3 , .

6.

2 ,  
(shaping aperture)

1

1

2

2

1

2

2

7.

3

1

1

2

2

1

2

2

8.

4

1

1

2

2

1

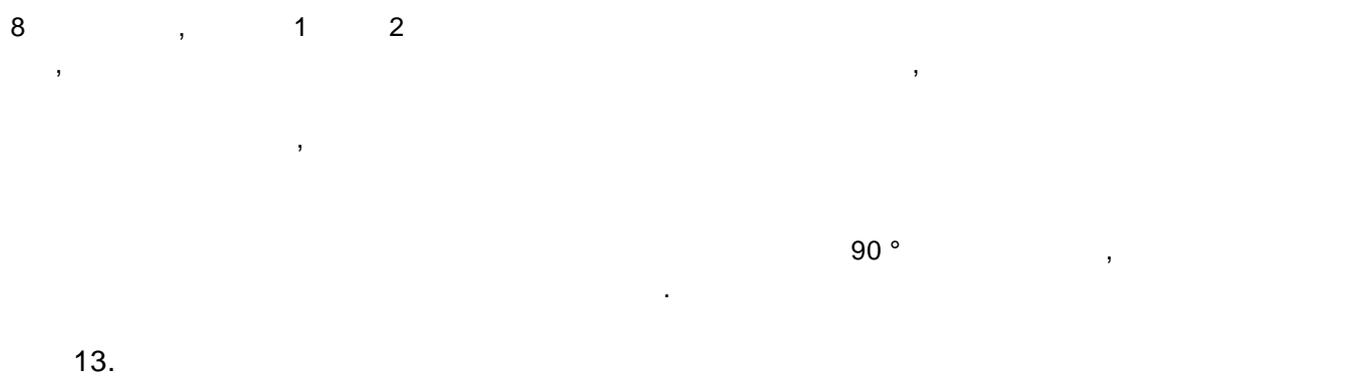
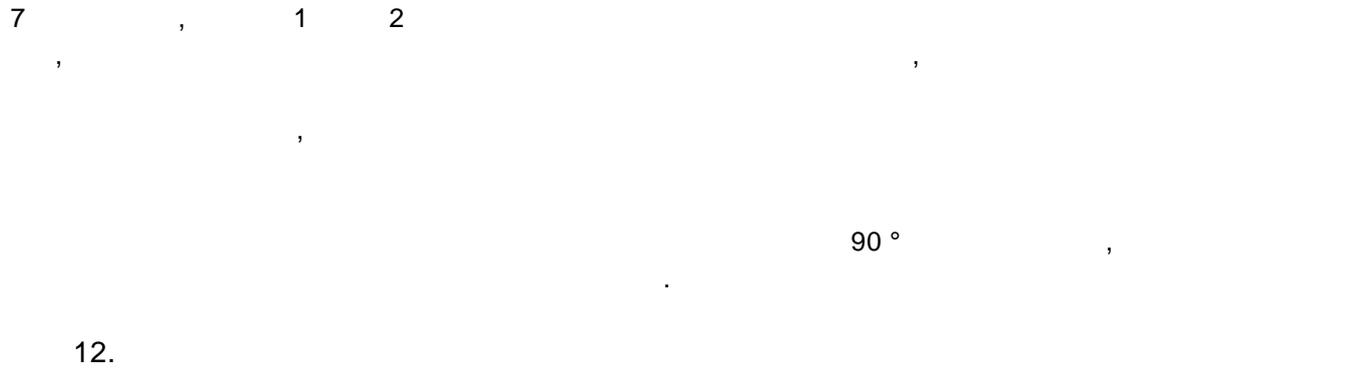
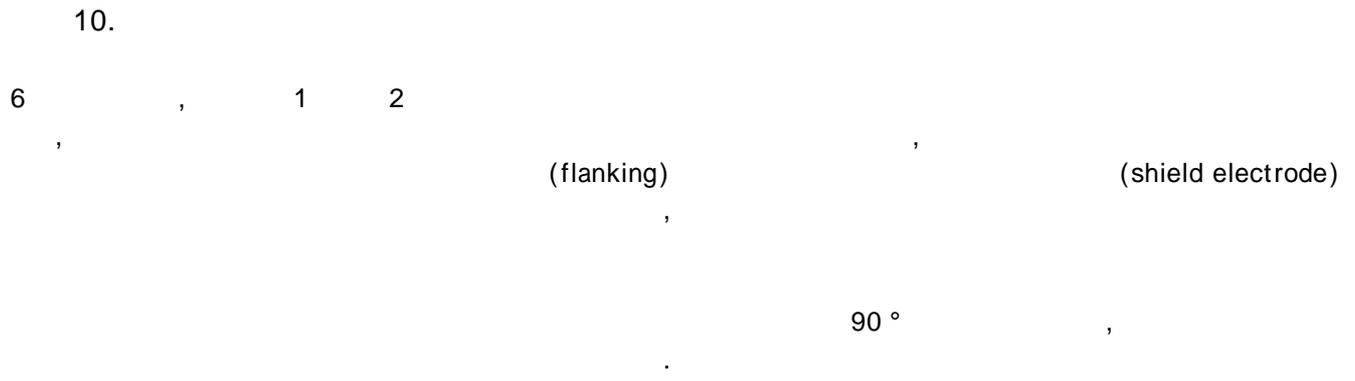
2

2

9.

5

1



90 ° ,

14.

6 ,  
,

1

가 .

15.

7 ,  
,

1

가 .

16.

8 ,  
,

1

가 .

17.

9 ,  
,

1

가 .

18.

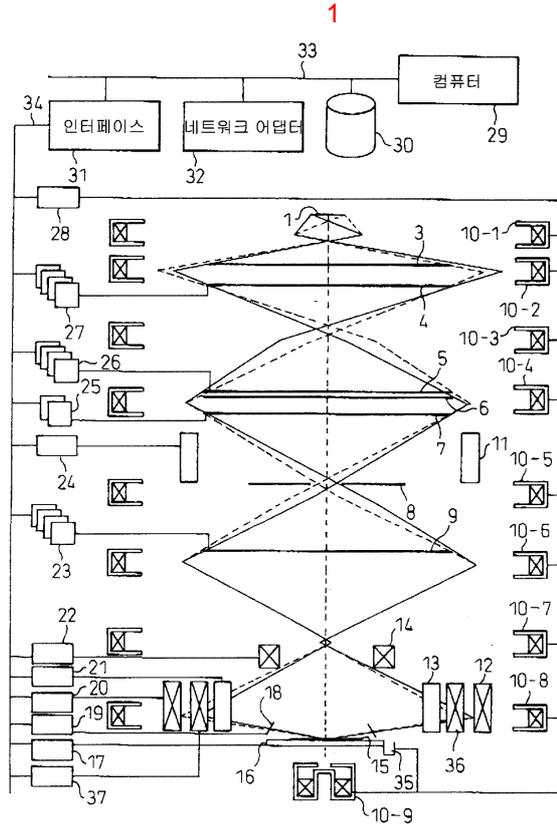
2 ,  
,

90 ° ,

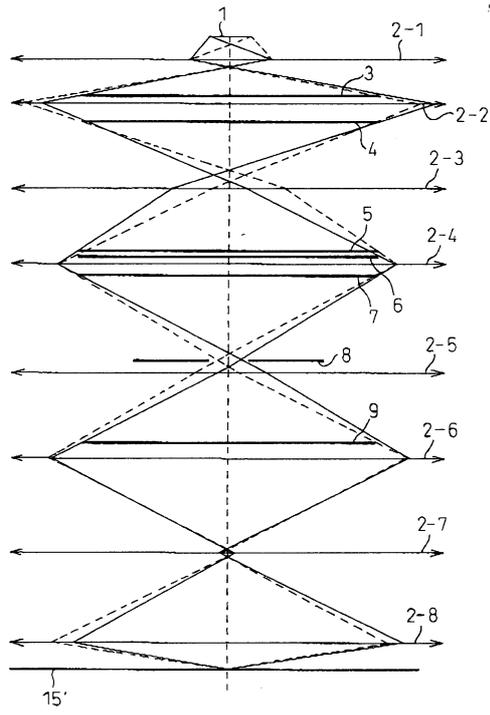
19.

4 ,  
,

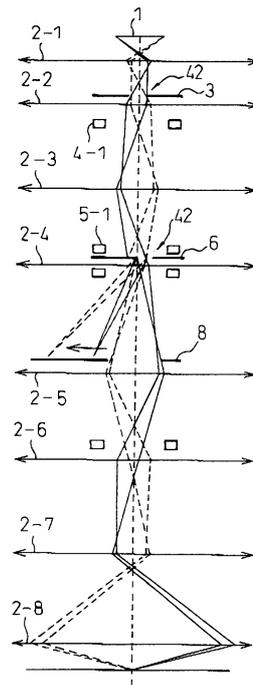




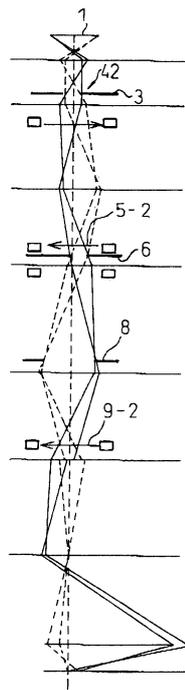
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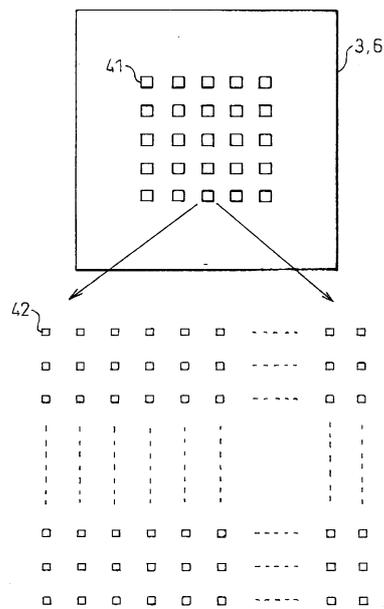
3a



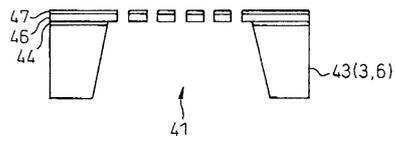
3b



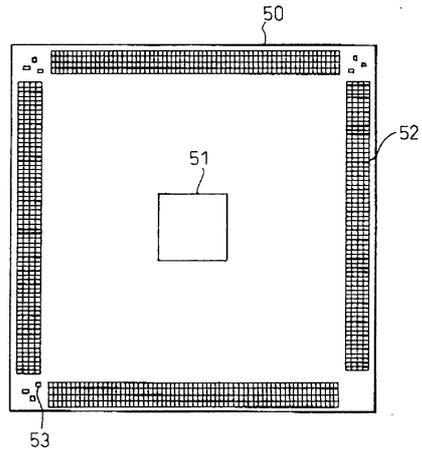
4a



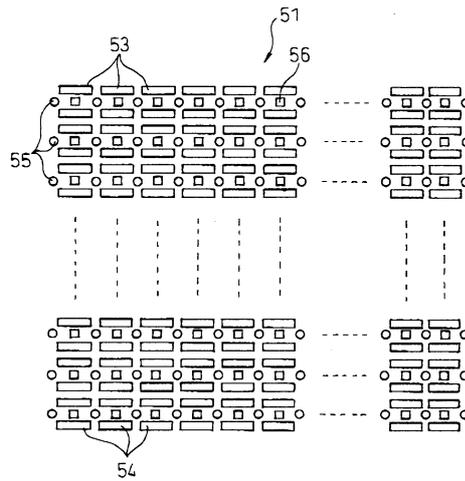
4b



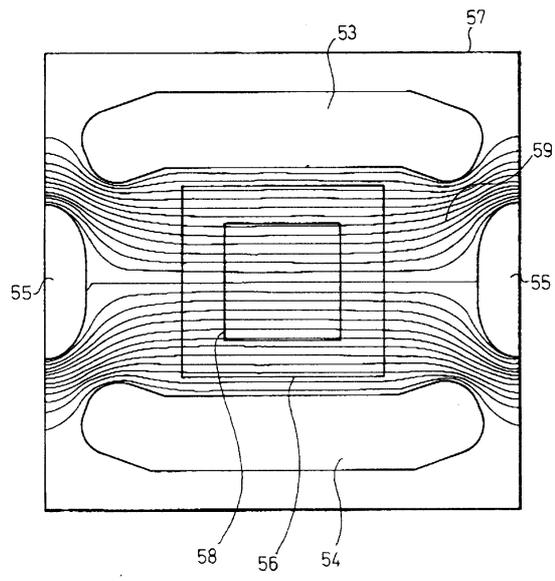
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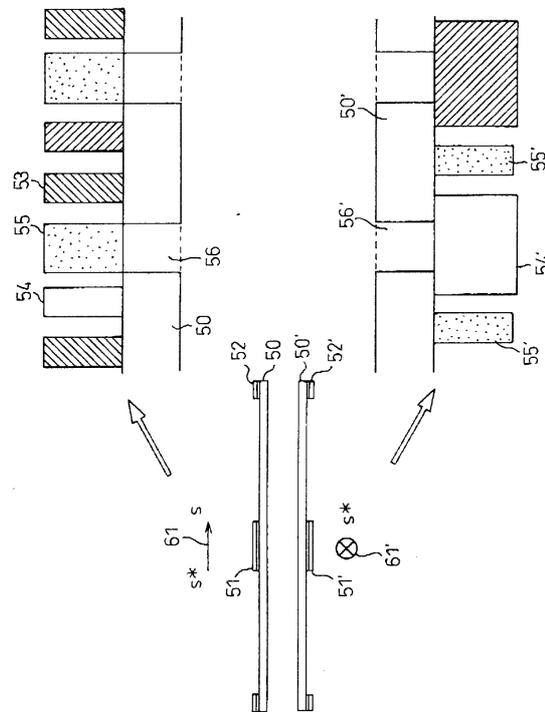
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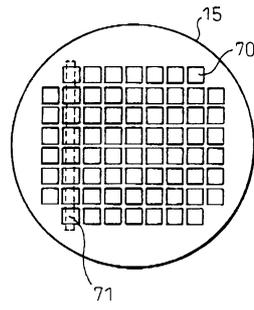
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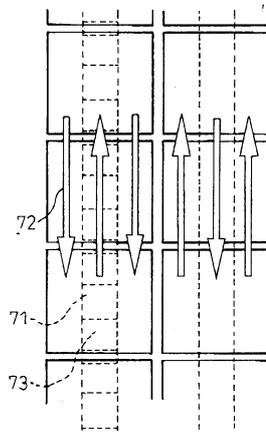
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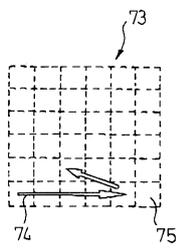
9a



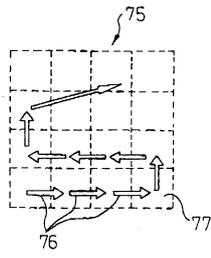
9b



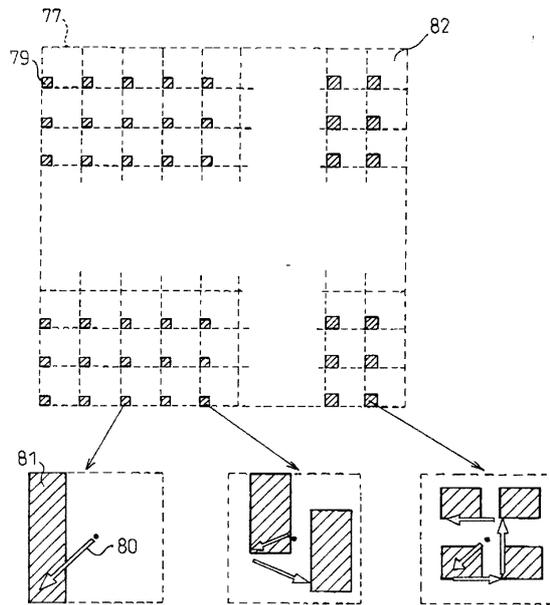
9c



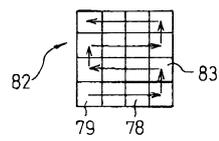
9d



10a



10b



11

