

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl. ⁷
B41J 2/135

(11)
(43)

2002 - 0006407
2002 01 19

(21) 10 - 2000 - 0066430
(22) 2000 11 09

(30) 1020000039554 2000 07 11 (KR)

(71)

3 416

(72)

902 803

2 103 1202

730 603

(74)

:

(54)

가 ;

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가

가

가

가

가

가

가

가

4

, , , ,

1a 1b

2

3

4 1 가

5a 4

5b 2

6 7 , 6 5A A - A'
, 7 B - B'

8 5

9

10 13

14 15

16 3

17 16 C - C'

18 4

19 5

20 21 6 , 20
, 21

22 7

23 가 .
 24 23 .
 25 26 8 .
 27 25 26 , .
 28a 28f 25 27 .
 29 32 25 27 , .

()
 - (electro - thermal transducer,) , (electro - mechanical transducer) .
 1a 1b (11)
 (10) 1 (12) 가 , 1 (12) (14)
 가 (10) (15) (droplet, 14') .
 , 가 가 , 가 .
 ,가 가 , 가 .
 , (main droplet) (s)
 atellite droplet) .
 , 가 , 가
 (cross talk) .
 (back flow) .
 1a 1b 2 (13) 2 (13) 1
 (12) 1 (12) (10) (16) , 1
 (12)가 (15) (15') .
 , ,가 가 .
 , 가 .
 , 가 , .
 , , .

, US 4,339,762 , US 4,882,595 , US 5,760,804 , US 4,847,630 , US 5,850,241 , U
 S 5,734,339, US 5,912,685, EP 317171 , Fan - Gang Tseng, Chang - Jin Kim, and Chih - Ming Ho, "
 A Novel Microinjector with Virtual Chamber Neck" , IEEE MEMS '98, pp.57 - 62
 가 . ,

2 4,882,595 . 2 , (1)
 (12)가 (26) (26) (24)
 (38) , (38) (26) (16) (18)

3 5,912,685 . 3 , (2)
 (3)가 , (3) (4)가 (3a)
 (3a) (3a) (6) (5)

2 3
 가 ,

가

가

가
 가

, 4,847,630 가 가 , 가 ,
 가 C 가 가 ,
 , , 가

1 가

2

3 가

4

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가 ;

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가 .

2

가

가

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가

가

가 ;

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가 .

2

가

4 가 1 1

5a

1

4 5a (301) (100)가 (300) (301)가

(100) (102) (101) (102) (103)
(103) (102) (103) (101) (107)
(104)가 ()가

(104) (101) (108) 가

가

(108) (104) (108) (108)
(108) (104) 2 (103) 2
(108) 3 5b (104) 2 , 1 2

4

(104) (105) (105) (103)
(106)가

(100) FPC (200) (106) FPC(Flexible Printed Cuirt) (200) (201)
FPC (100)가 (204)가 (10
0) FPC (106) (201) 1:1 가 , FPC (200)
(201) (203) (203) ()가

6 7
7 B-B'

6 5a A-A'

6 7 , (103) (102) (101) (1
 10)가 , , , (108) (108) (108) (108) (108) (108) (108)
 108) , 가 , (108) (108) , 7 (108) (108) (108)
 , (102) (107) .

(110) (103) , 8 (3
 00) (301) , (302) , (107) (400)
 가 (300) .

9 가 (104) (108)
 10 12 (104) , (108)

9 (104) (108)
 가 , (104) 가 가 , (104)
 , (104) .

10 13 (104)
 (refill) .

10 (104) (400)가 (110) (40
 0) (110) .

11 가 가 (104) (401) 11
 (401) 가 (401) ,
 (401) (108) (110) 가 .
 , (108) (400) 가 (408) .

12 (104) (401) (401)
 401) (401) 가 가 , 가 (401)
 400)가 (402) (108) .

13 (108) (400) , (401) (401)
 (400) , 10 (401)
 (104) .

, (401) 가 가 (402)
 (satellite droplet) .

, (104)가 가 (401)
 가 가 .

(104) 14 (104) 가 .
 (104b) , (104a), 15
 (104, 104a, 104b)

09) 가 , 가 (108) (1

(110)

C - C' 17 3 (102) 16 16
 (111) (111) , 2 1 2
 (110a, 110b) 가

(101) (111) 4 18
 (101a)

가 15 16
 19 5 (102)
 (111, 101a)

(112) (101a) (108) (101)
 가 , (112) (101a)

가 20 20
 6

20 20 01b) (101) (108) (108) (101b)가 (1

21 (110) 가 (108) (108) (101b)
 (108) (101b)
 (101) (101)
 가 가

가 가

22

, 2

7 (101)

(102a) 가 (106a)가 2

3 (103a, 103b, 103c)가

(107a, 107b)가 (110', 110') (110', 110')

(102)

(110' 110')

(104)

(105a)가

(102)

(102)

(102)

23 (dicing line, 501)

(107)

(502)

가

(500)

(501)

(501)

(102)

24

(102)

(501)

(102)

p - Si TaAl

Si₃N₄

KOH

TMAH(Tetramethyl Ammoniu

m Hydroxide)

(104)

(500)

(low pressure chemical vapor deposition)

0.8μm

(500)

(500)

(502)

(500)

1μm

(104)

가

가

8

25

(101)

(102)

(103)

(108a)

(110))가

(108a)

(105)

(106)

(102)

(108a)

(108a)

(102)

(600)가

102a)

(102a)

(108a)

(108a)

(W)

가

(104a)

(108a)

(101) (108a) 가 가 .
 (108a) (108a) 가 가
 (108a) (108a) (104a) (108a) (110) 가
 (108a) (102) (101) (102) (102b) (102c)
 27 25 26 (104a) (102) (102b)
 (101) 가 (104a) (102a)가 (104a) (102) (104a) (102b)
 가 (102c) .
 (102b)가 (102c) (102b) (104a) (102) (102) (102b) (102c) (10)
 (102c) (102b) SiO₂ (102c) Si₃N₄ .
 (102) (600)가 (600)
 (600) (600) 8 (102) 1 7 .
 (101) (108a) (101) (102)
 (104a) (108a)
 1 7 가 .
 1 7 가 ,
 8 .
 8 .
 28a (102) (102a) (102a)
 (101) .
 28b (102) SiO₂ (102b) .
 28c (102a) (104a) .
 28d (104a) (106)
 (102a) .
 28e Si₃N₄ (102c) .
 28f (102) (600) .
 (102) (102) 7 (101) .

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2.

1 ,

2

3.

1 ,

가

4.

2 ,

가

5.

1 4 ,

가

가

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7.

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8.

1 , 2 , 3 , 4 , 6 7 ,

9.

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10.

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

11.

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12.

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12 13 ,

15.

1 , 2 , 3 , 4 , 6 , 7 , 9 , 11 , 12 13 ,

16.

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14 ,
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20.

1 , 2 , 3 , 4 , 6 , 7 , 9 , 11 , 12 , 13 16 20
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가 ,
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21.

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가 ,
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22.

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가 ,
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23.

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가 ,

24.

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가 ,

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가 ,

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26 30 ,

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26 30 ,

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35.

26 30 , 32 34 ,

가

36.

31 ,

가

37.

33 ,

가

38.

26 30 , 32 , 34 , 36 37 ,

39.

31 ,

40.

33 ,

41.

35 ,

42.

26 30 , 32 , 34 , 36 , 37 , 39 41 ,

가

43.

31 ,

가

44.

33

가

45.

35

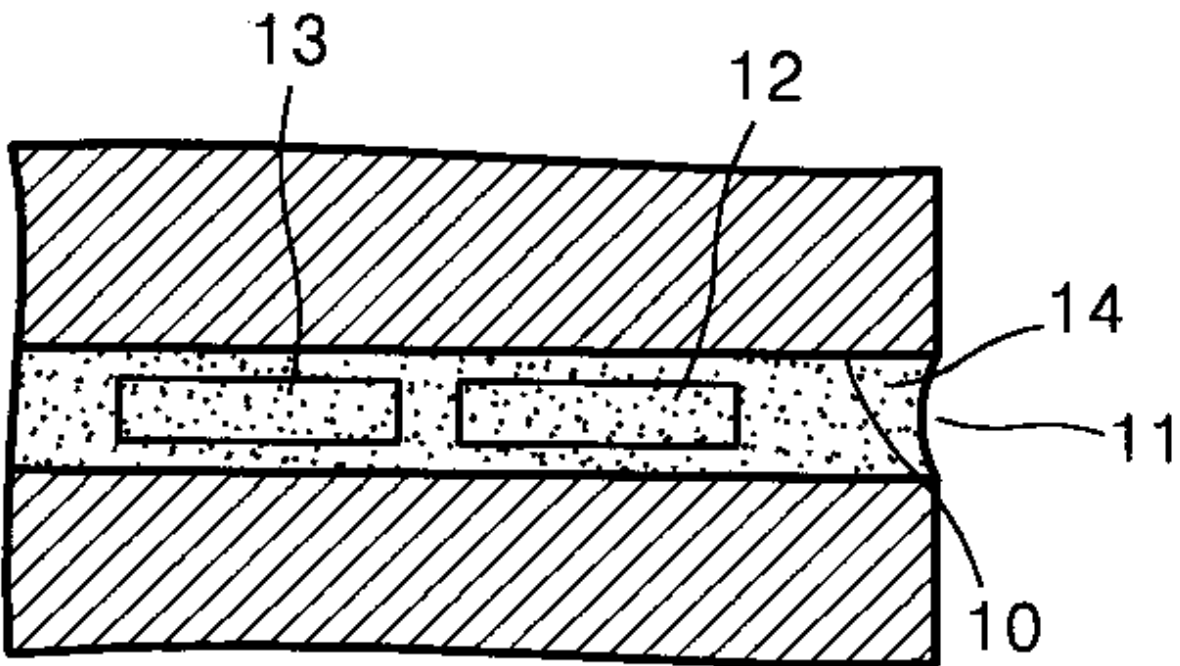
가

46.

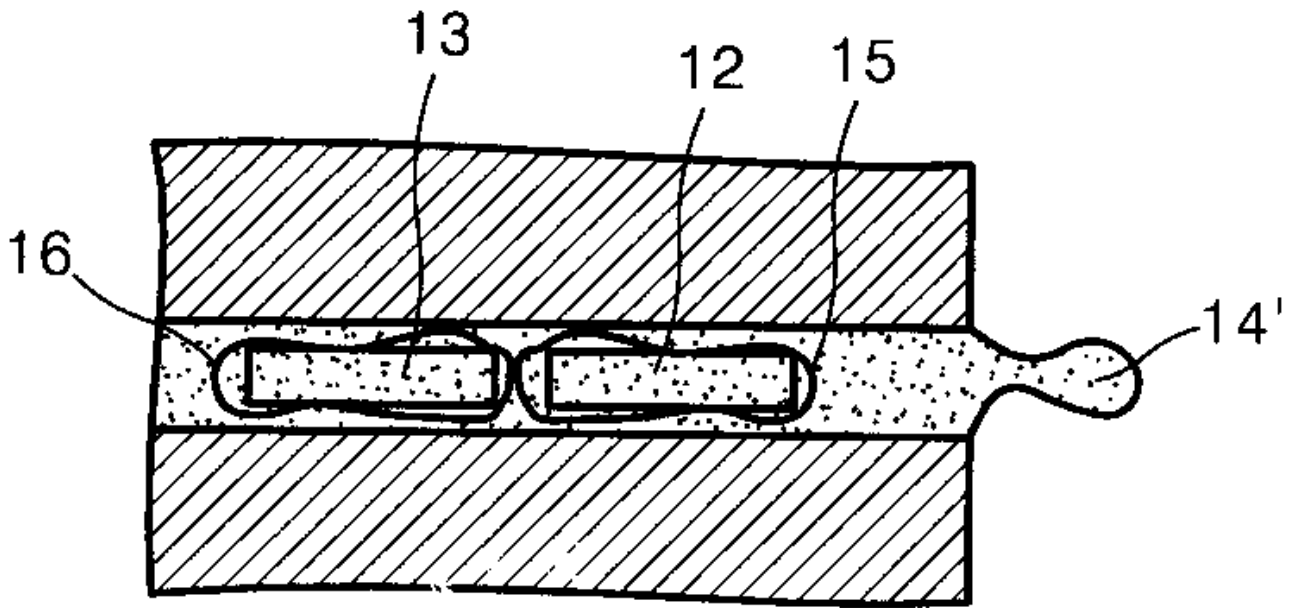
38

가

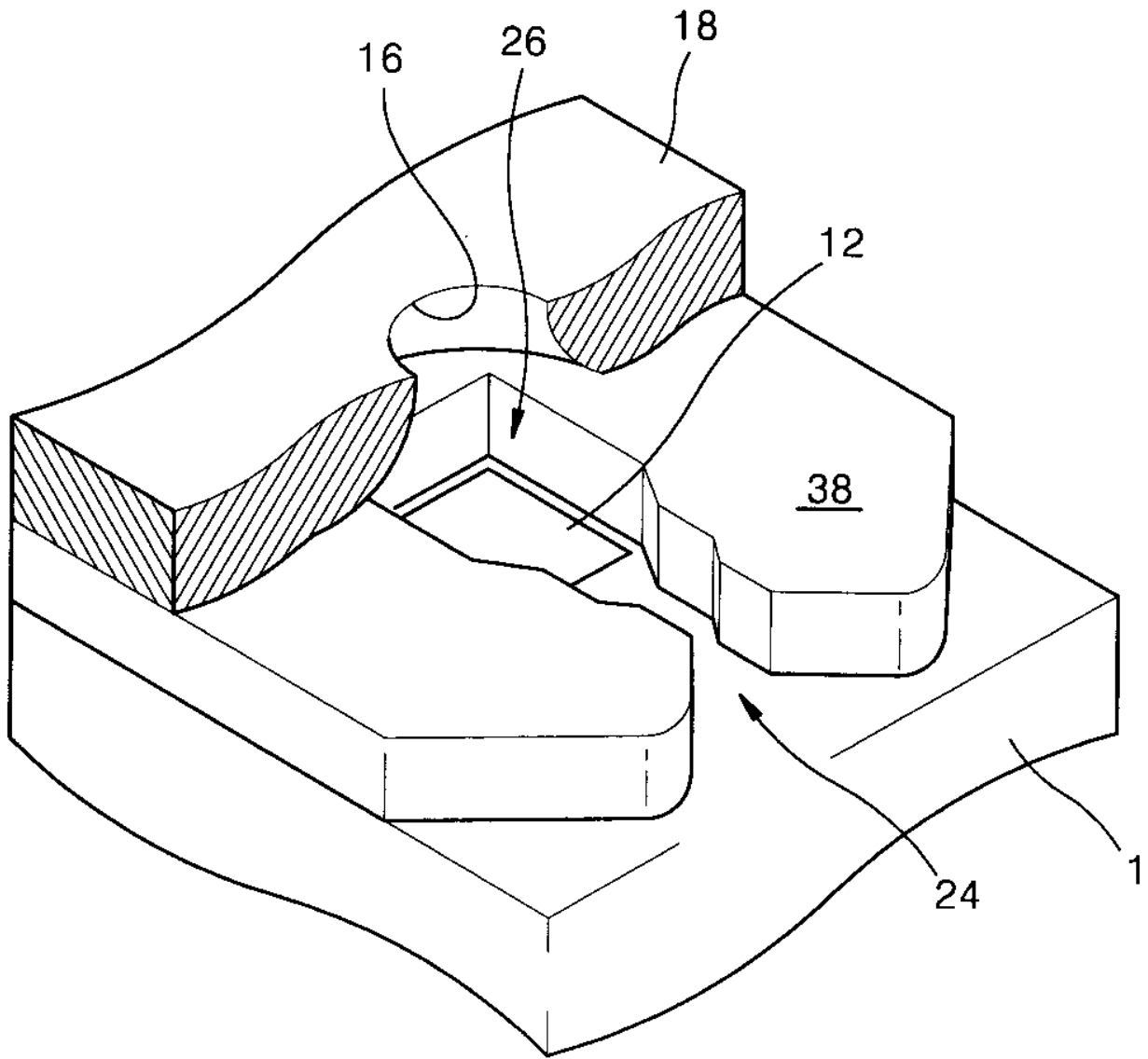
1a

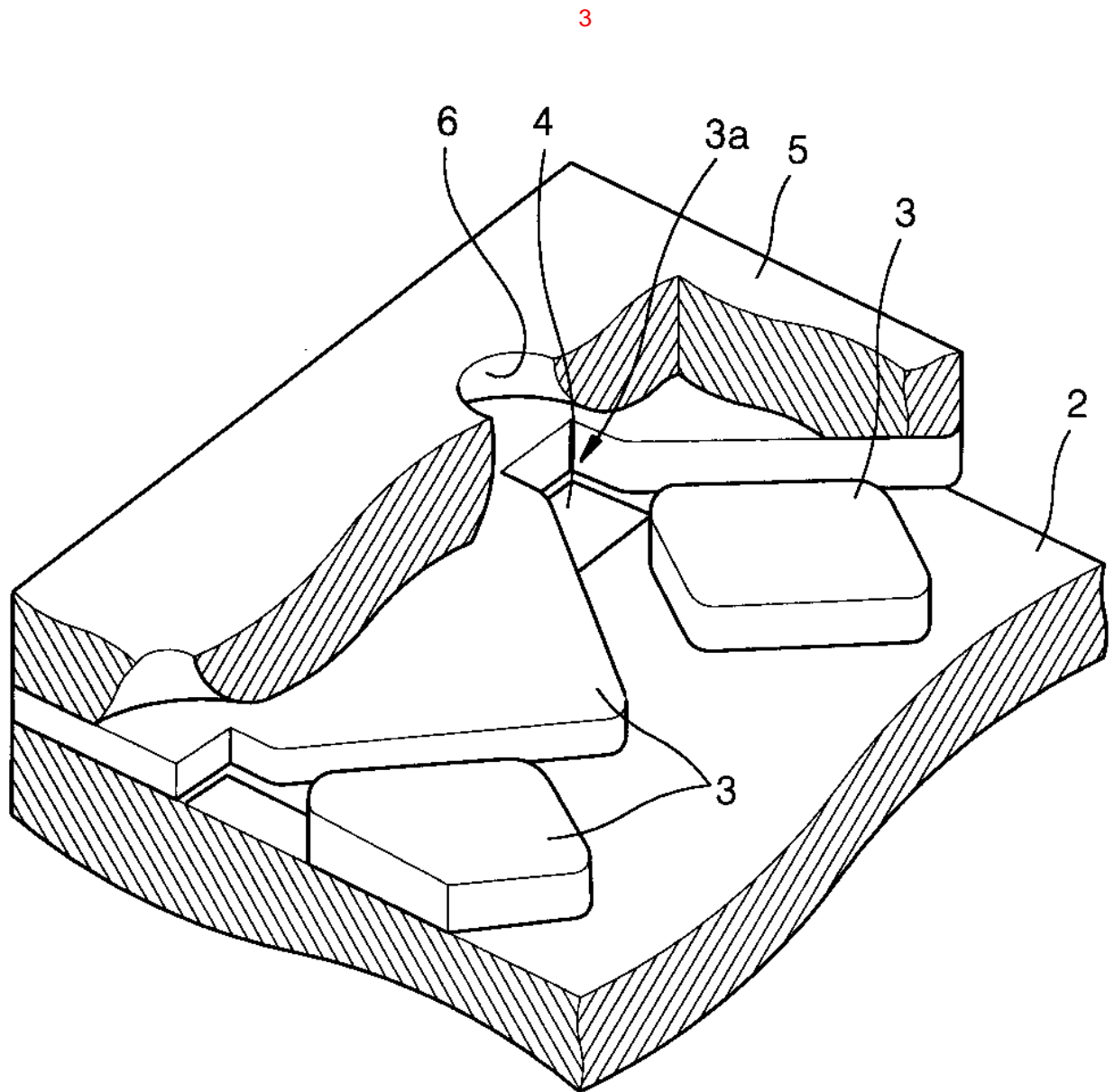


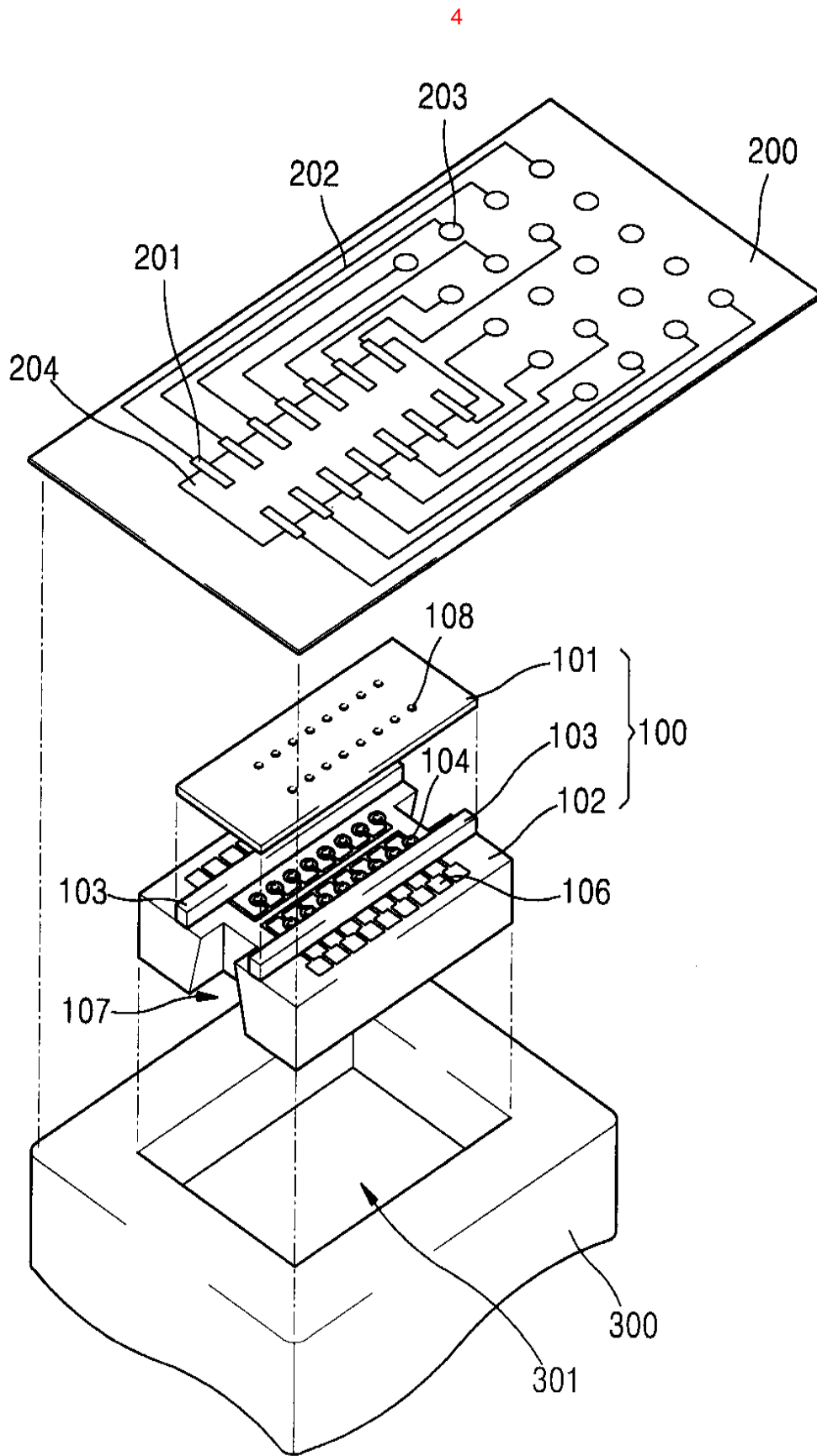
1b



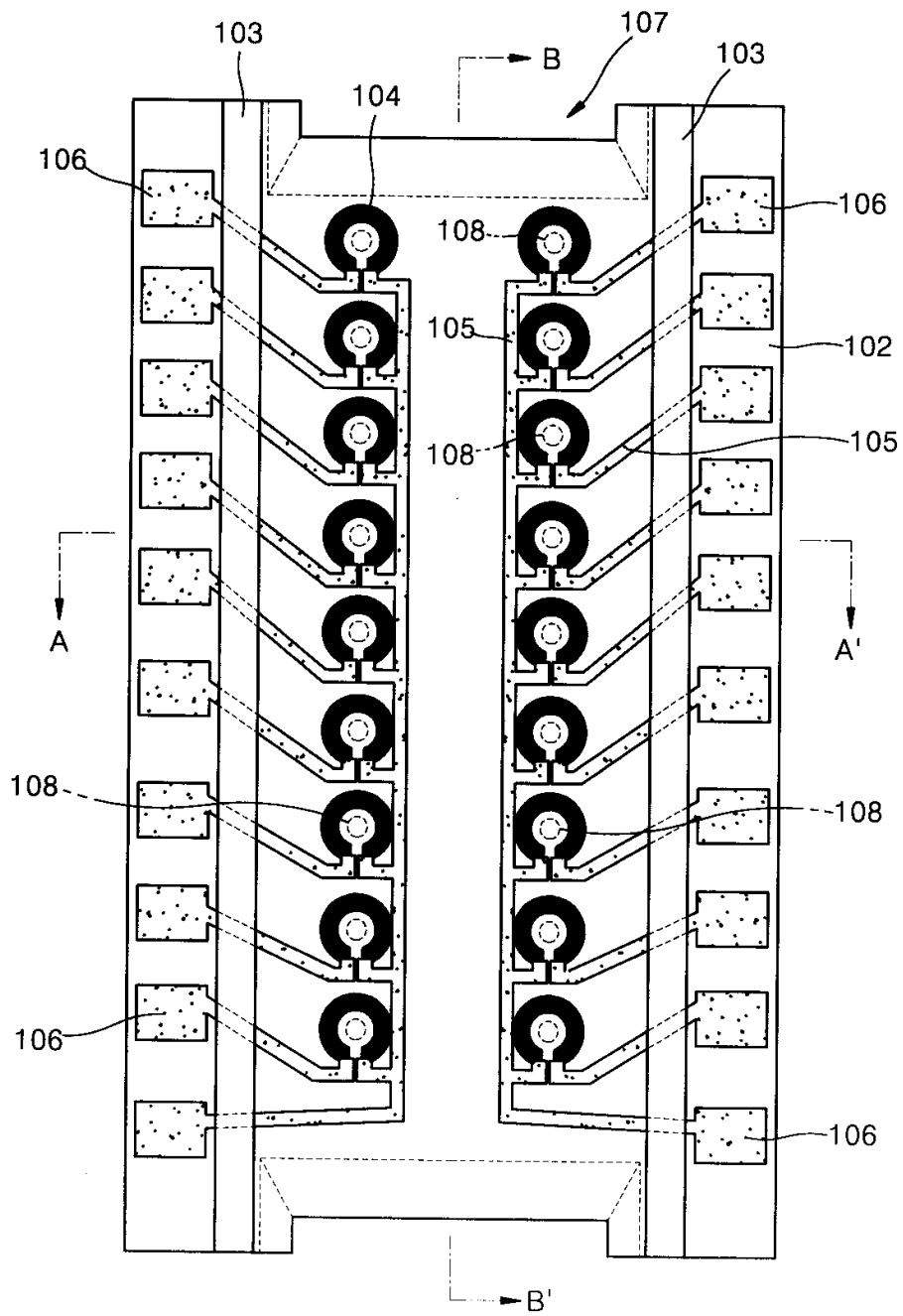
2



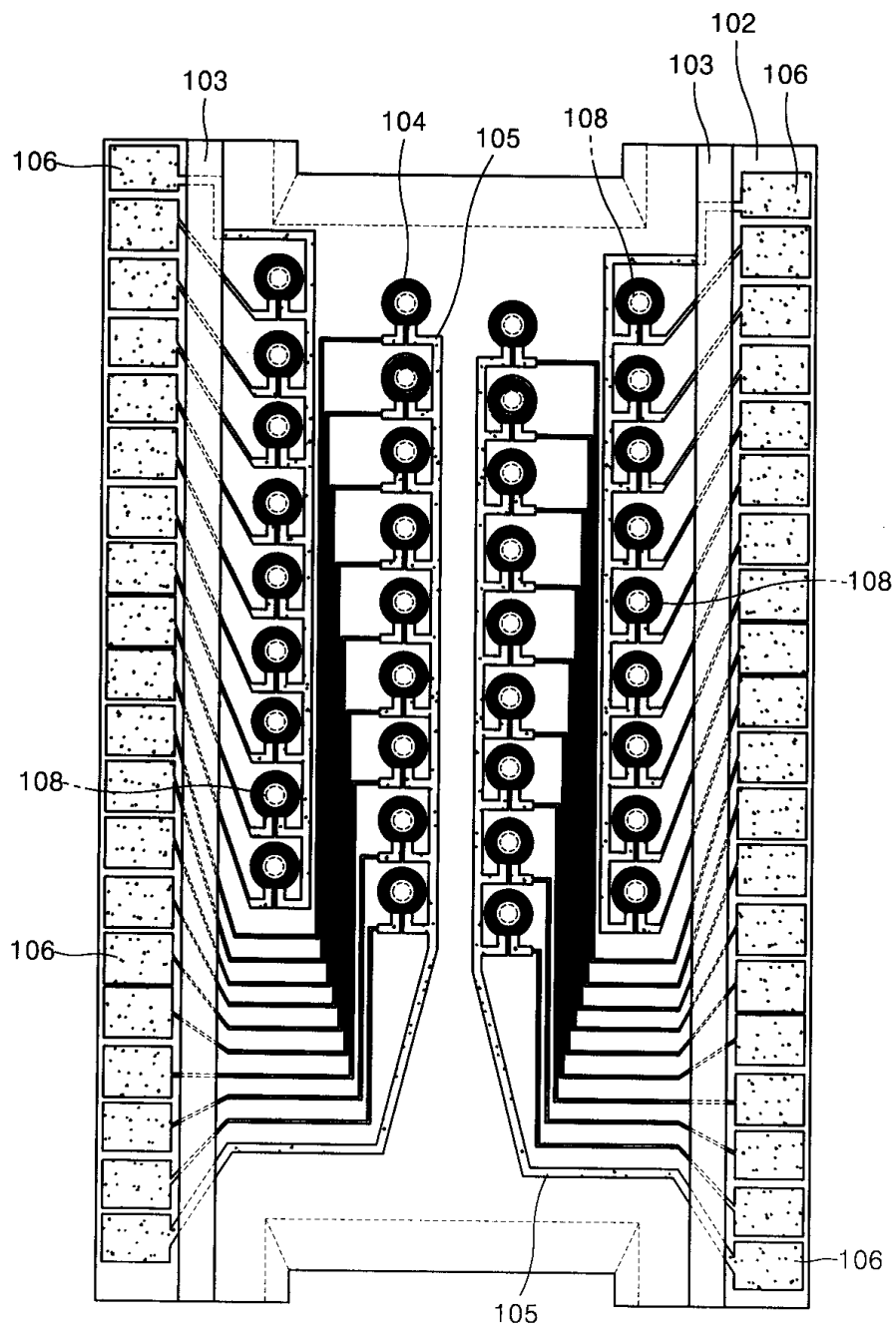




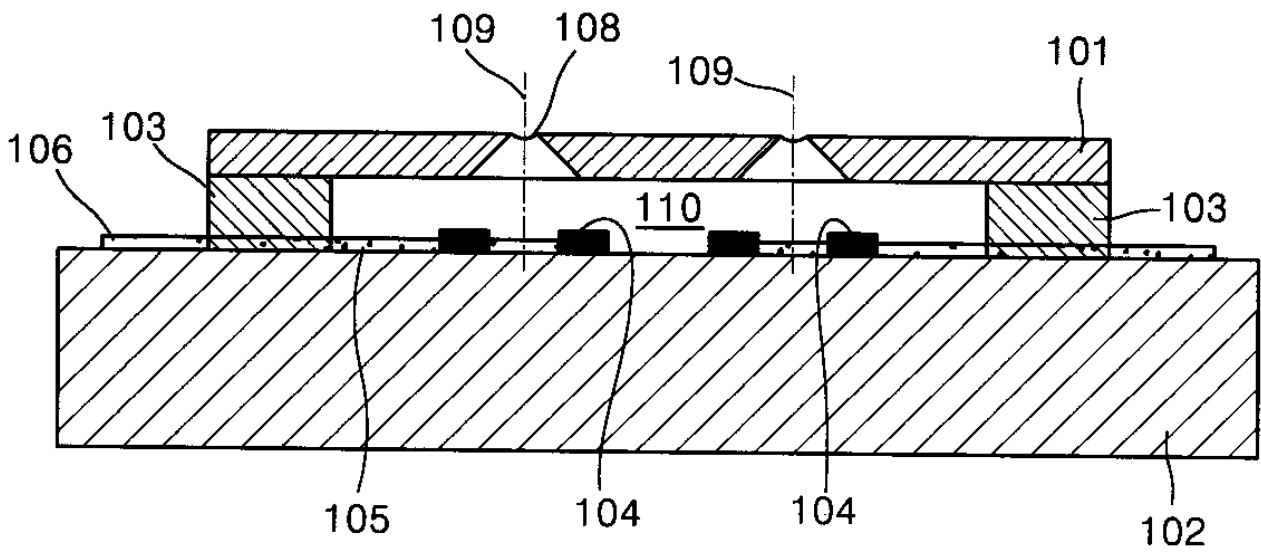
5a



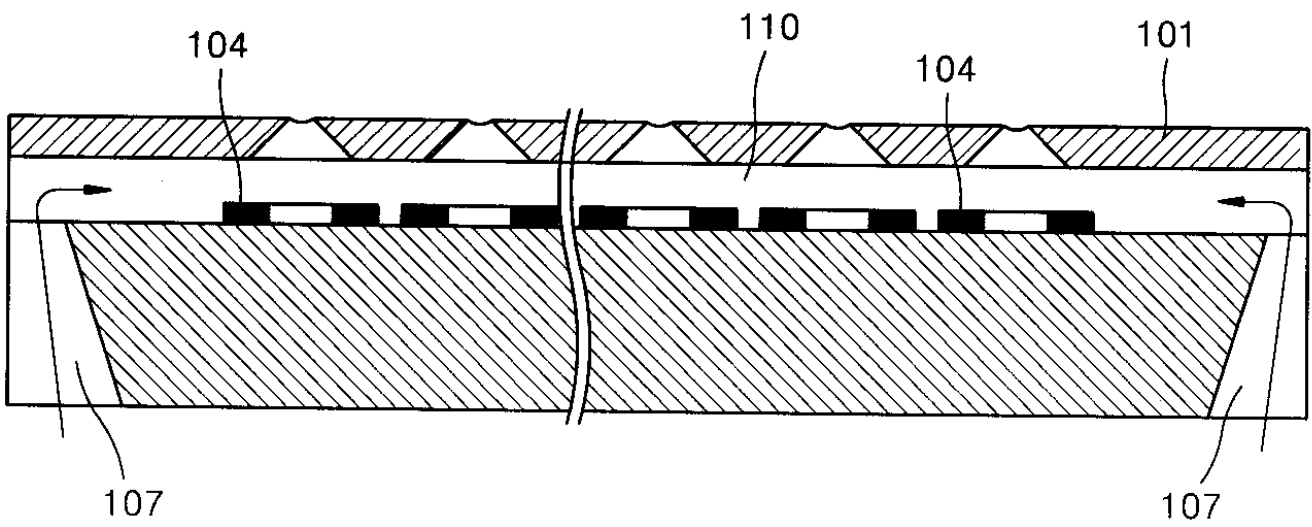
5b



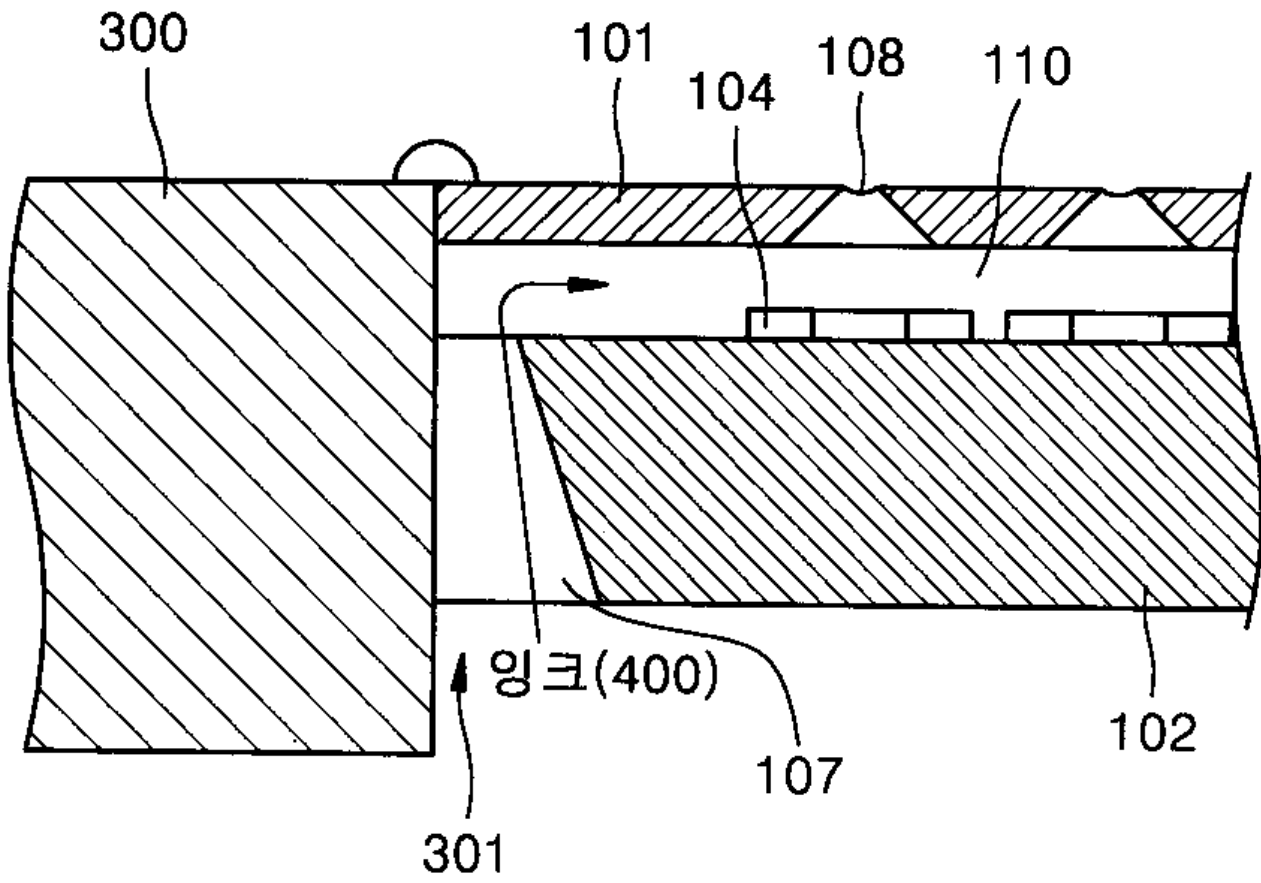
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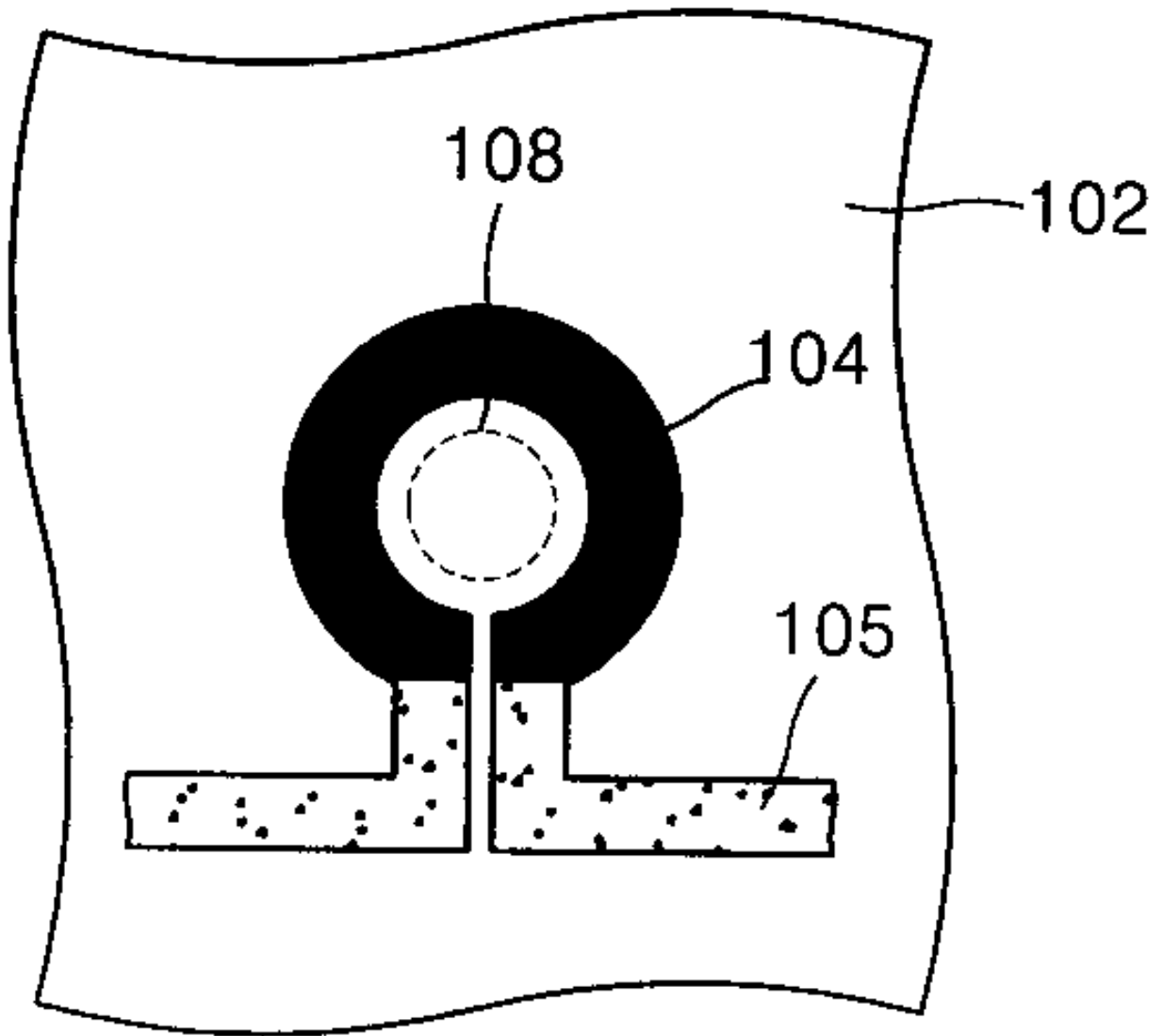


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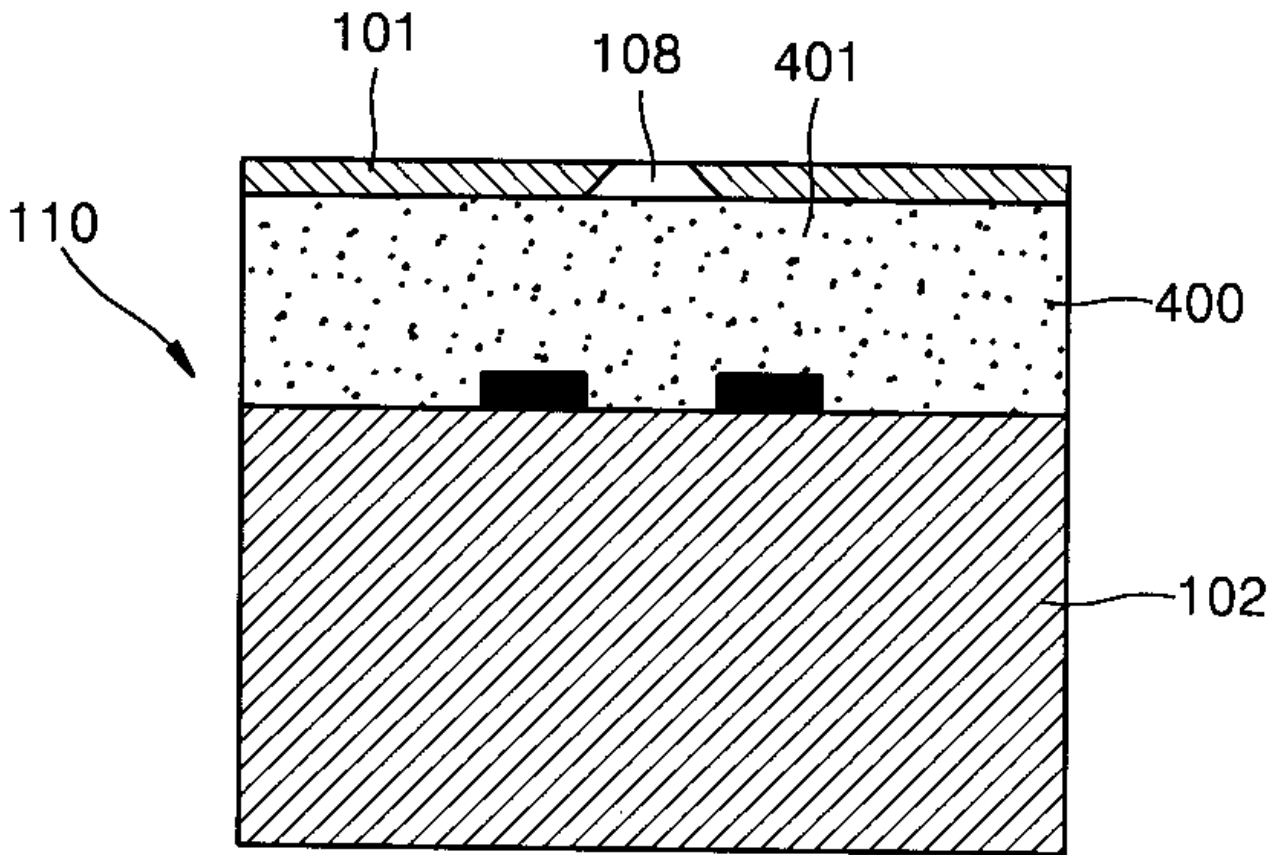


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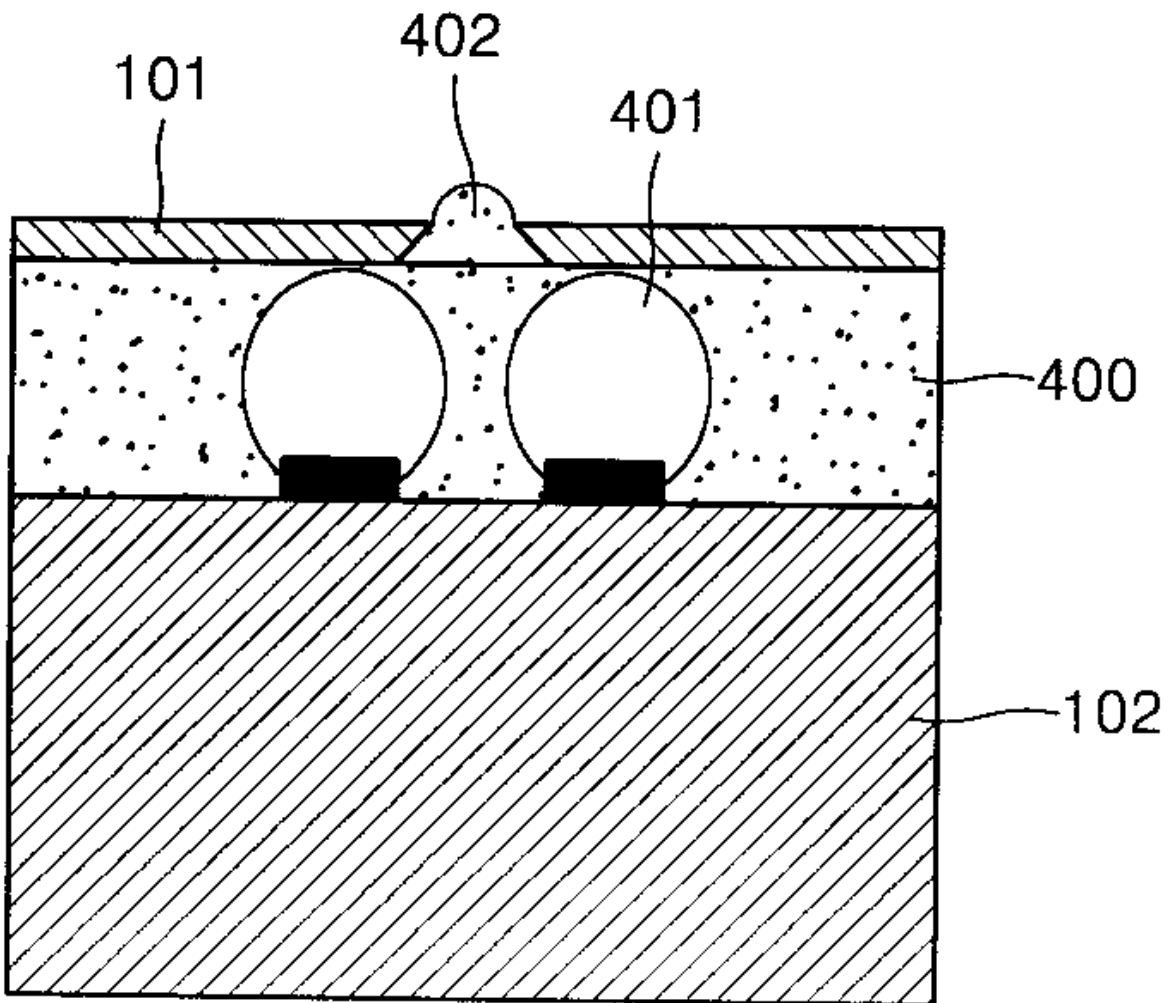




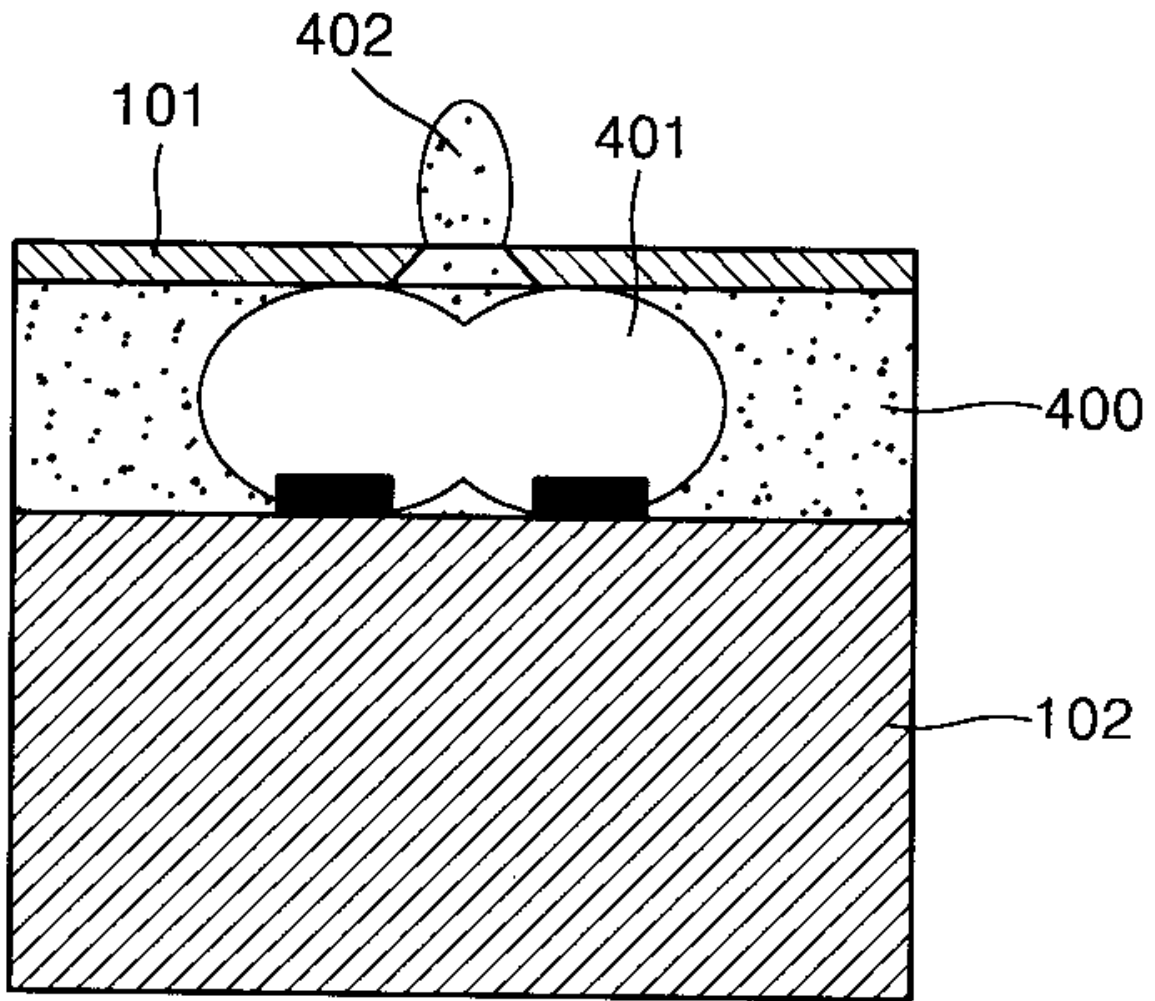
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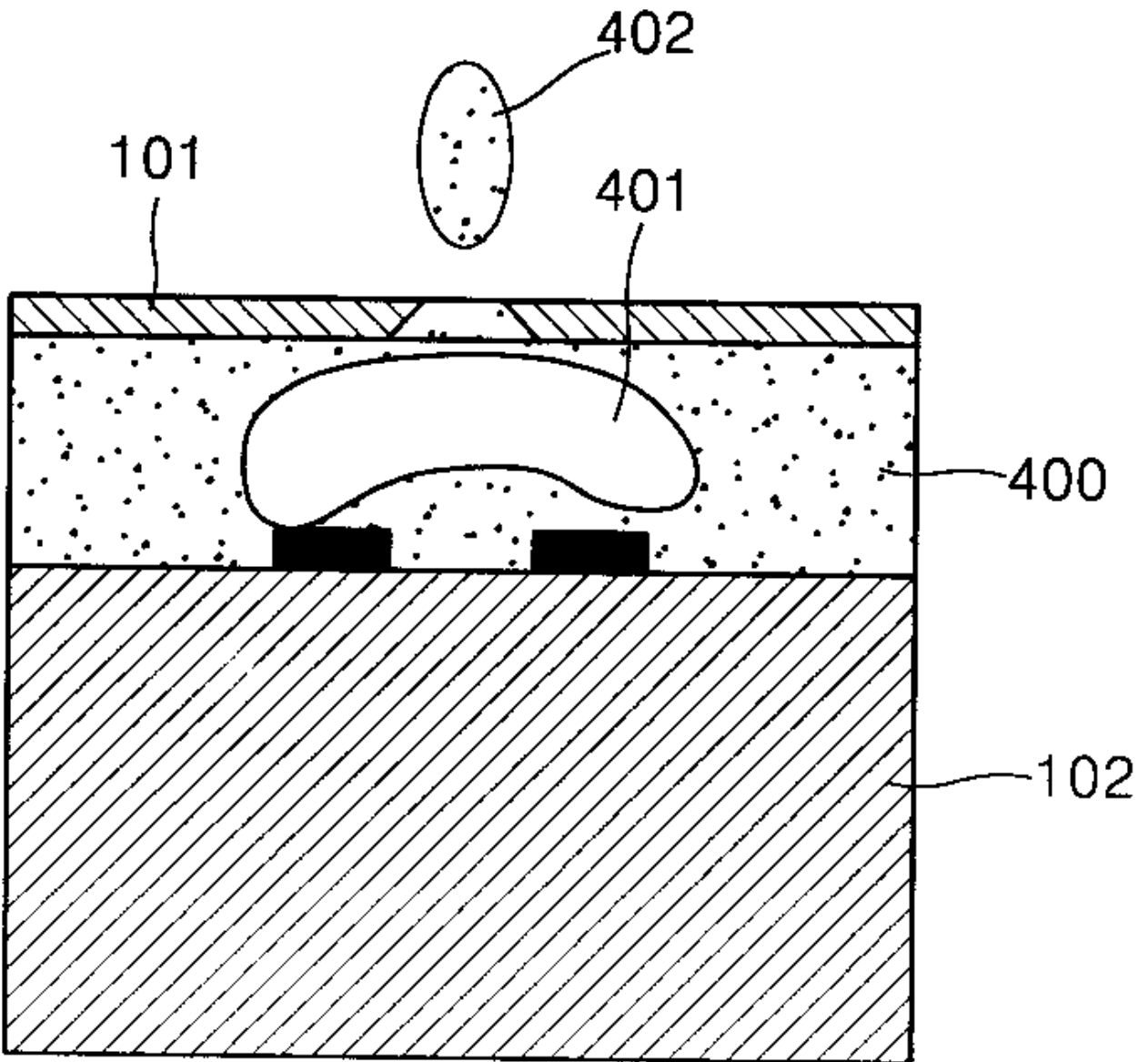
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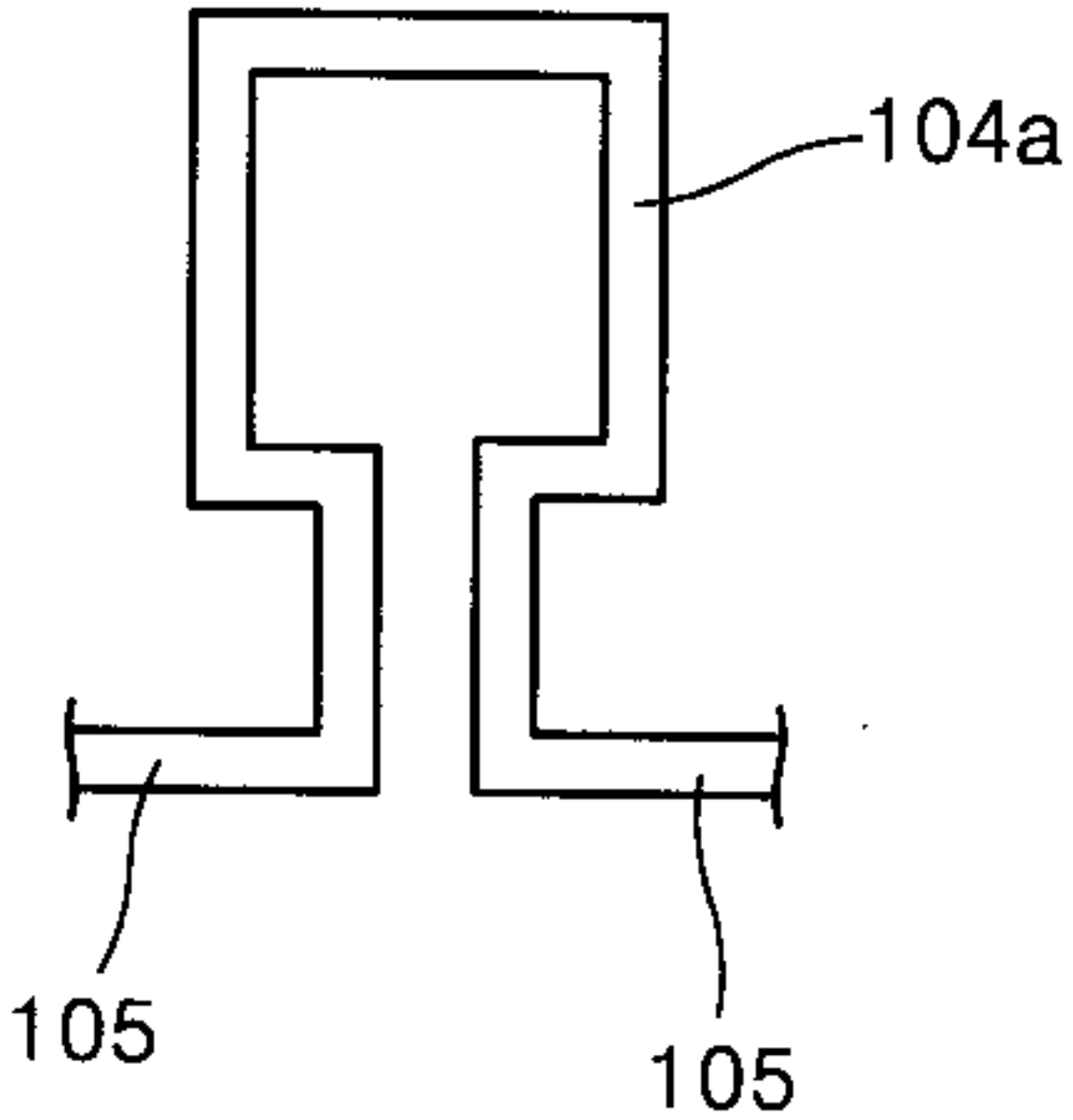


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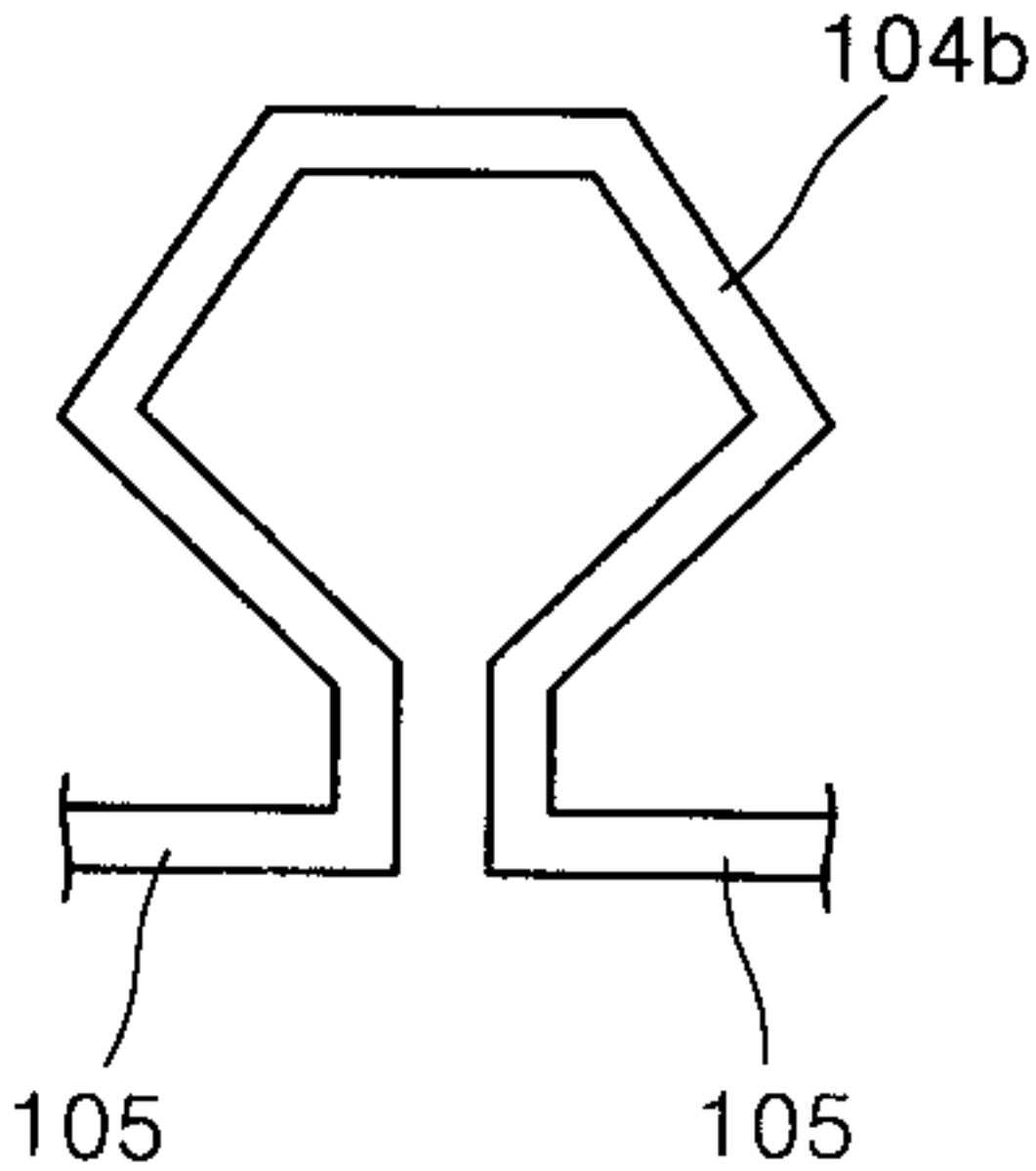


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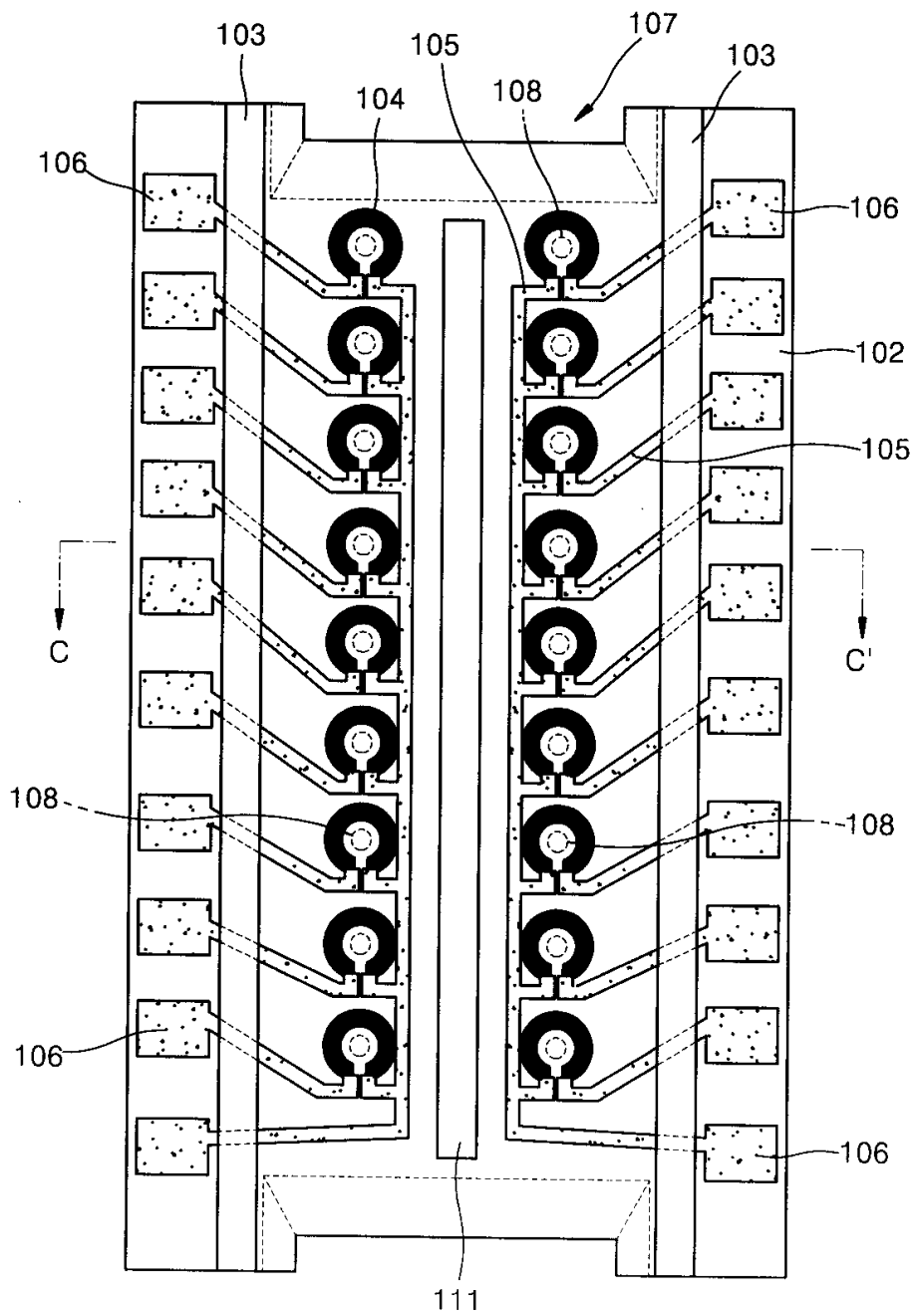




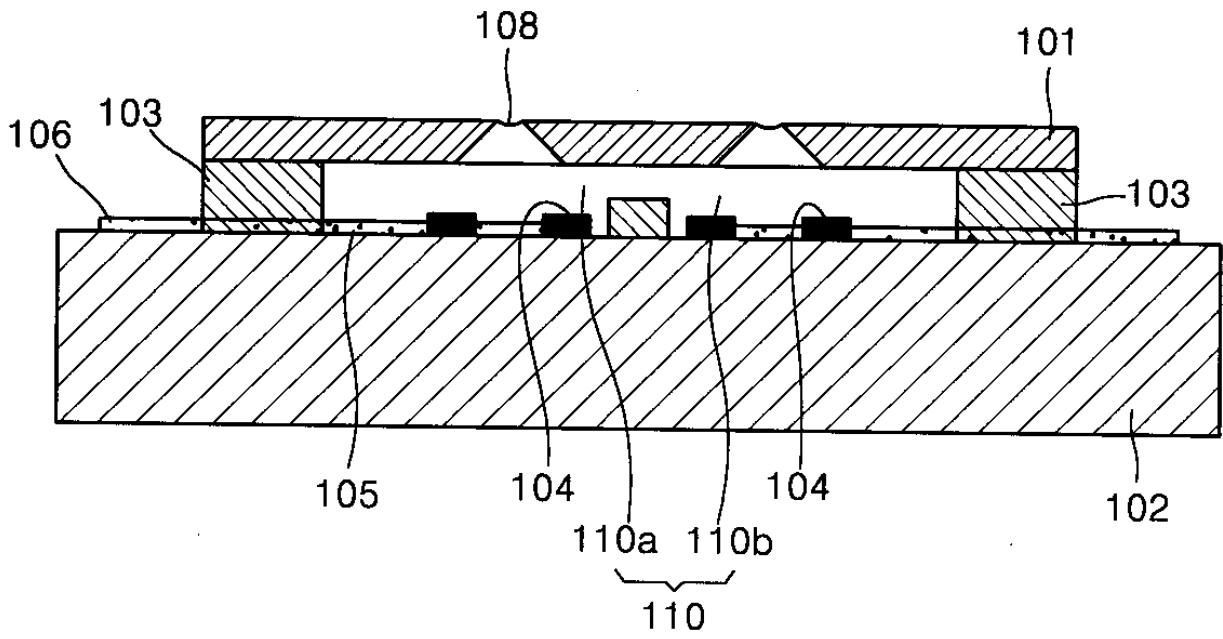
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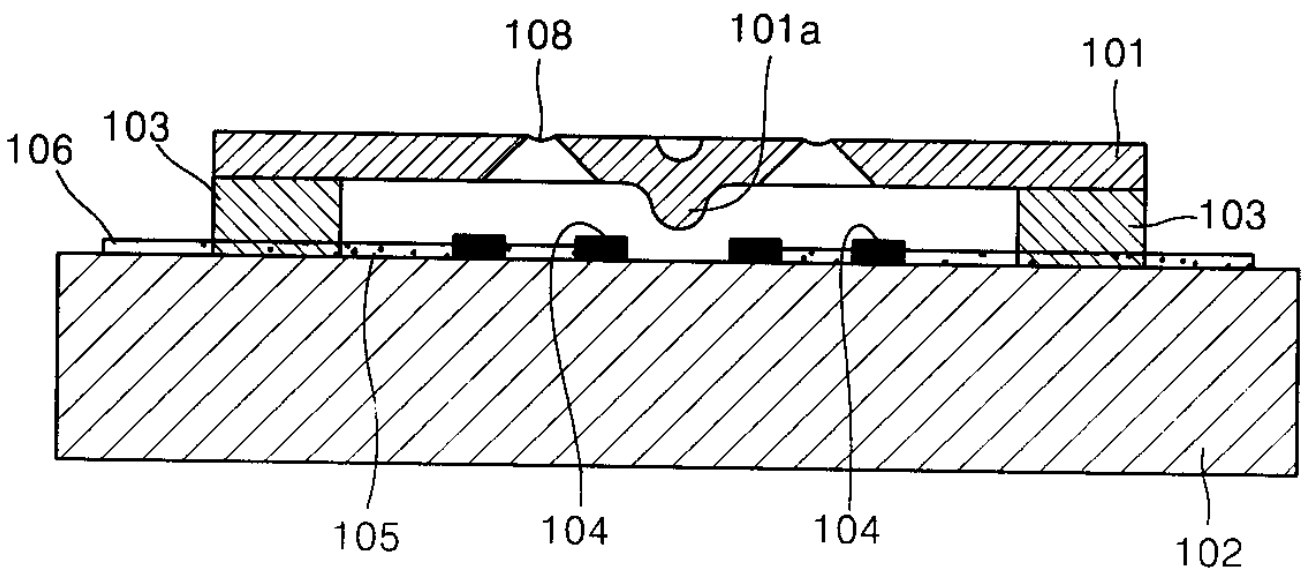
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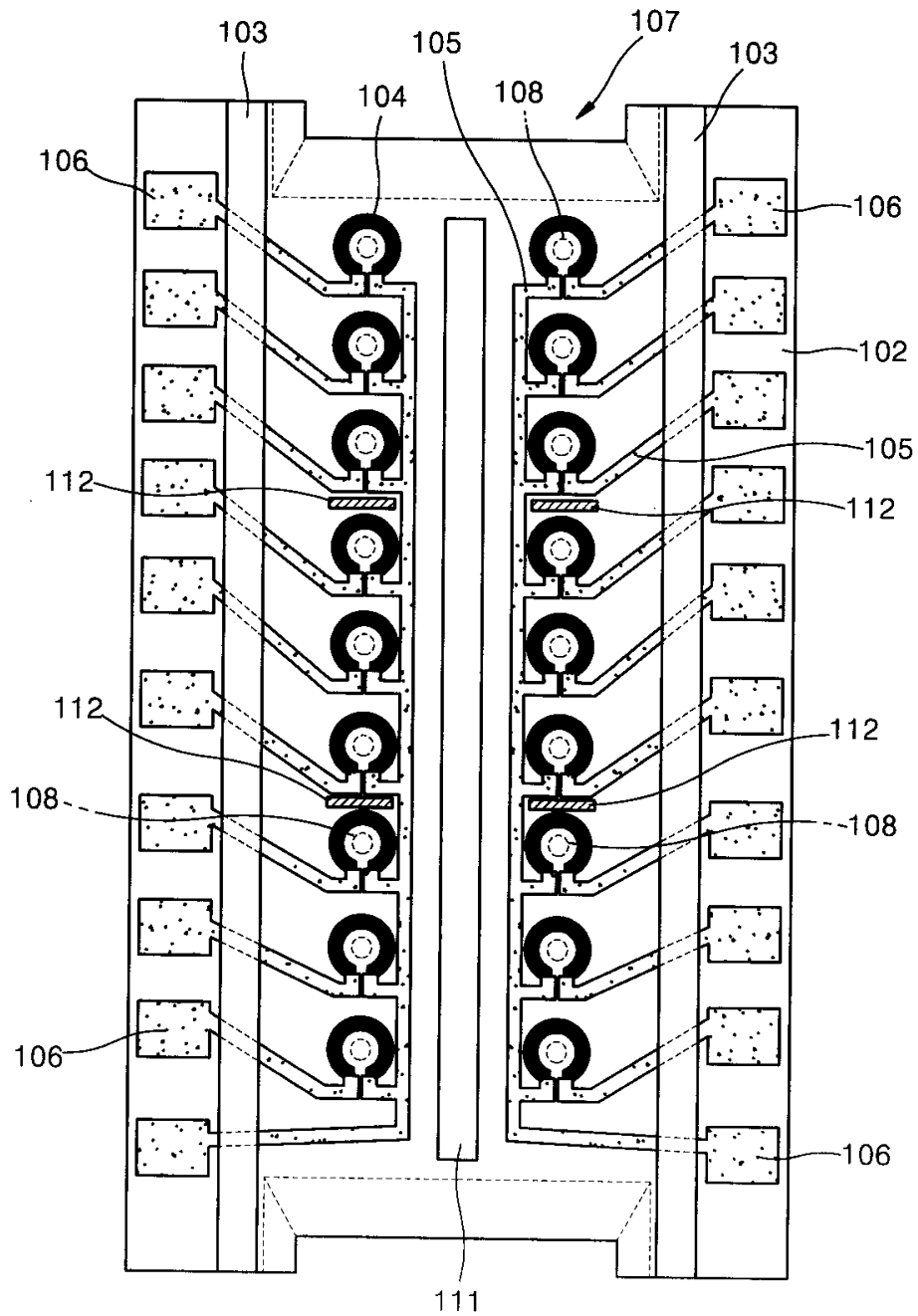
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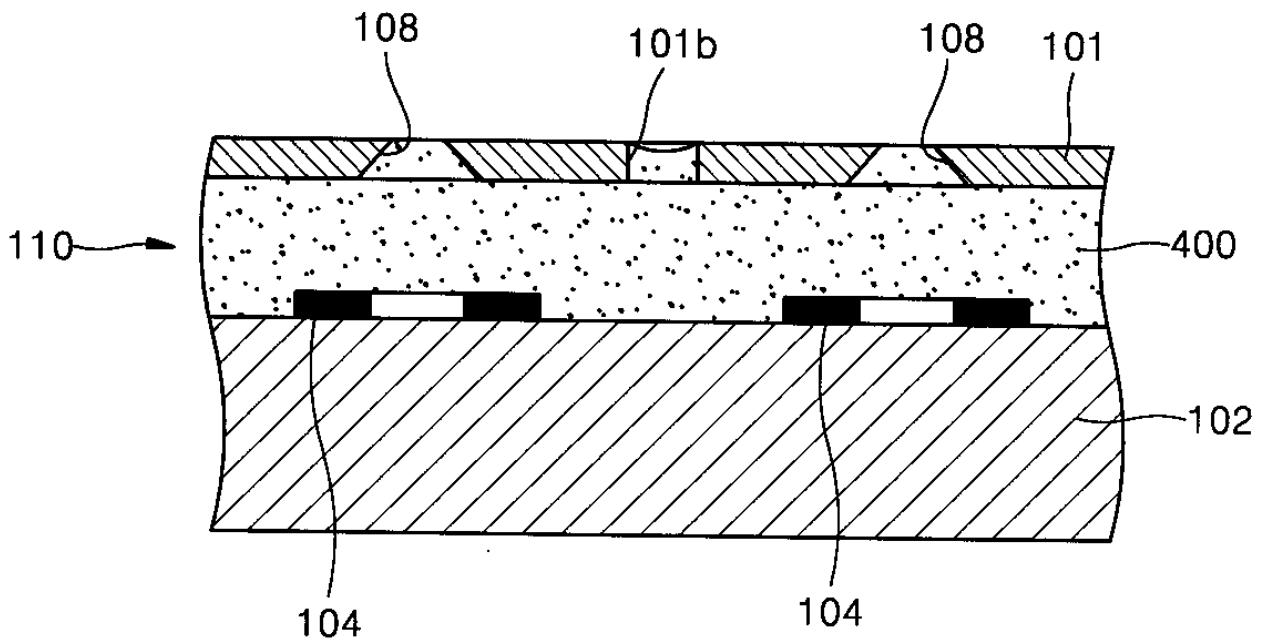
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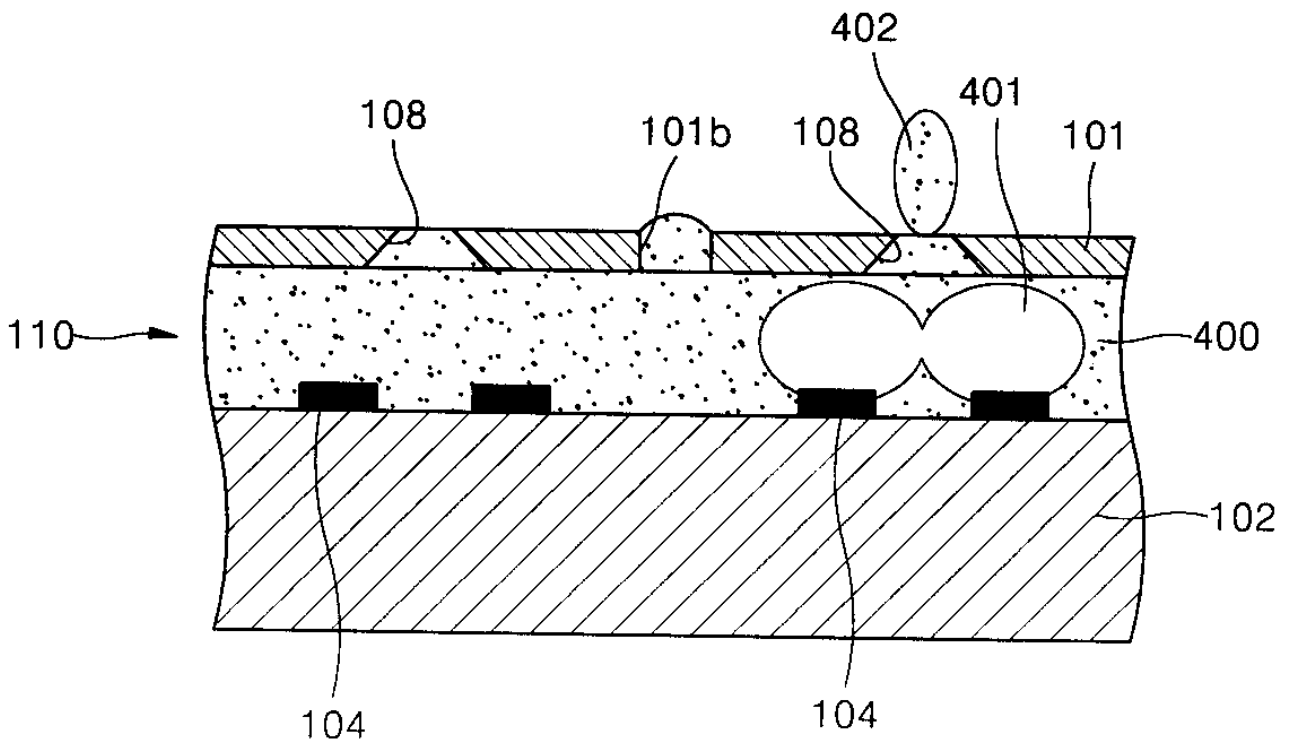
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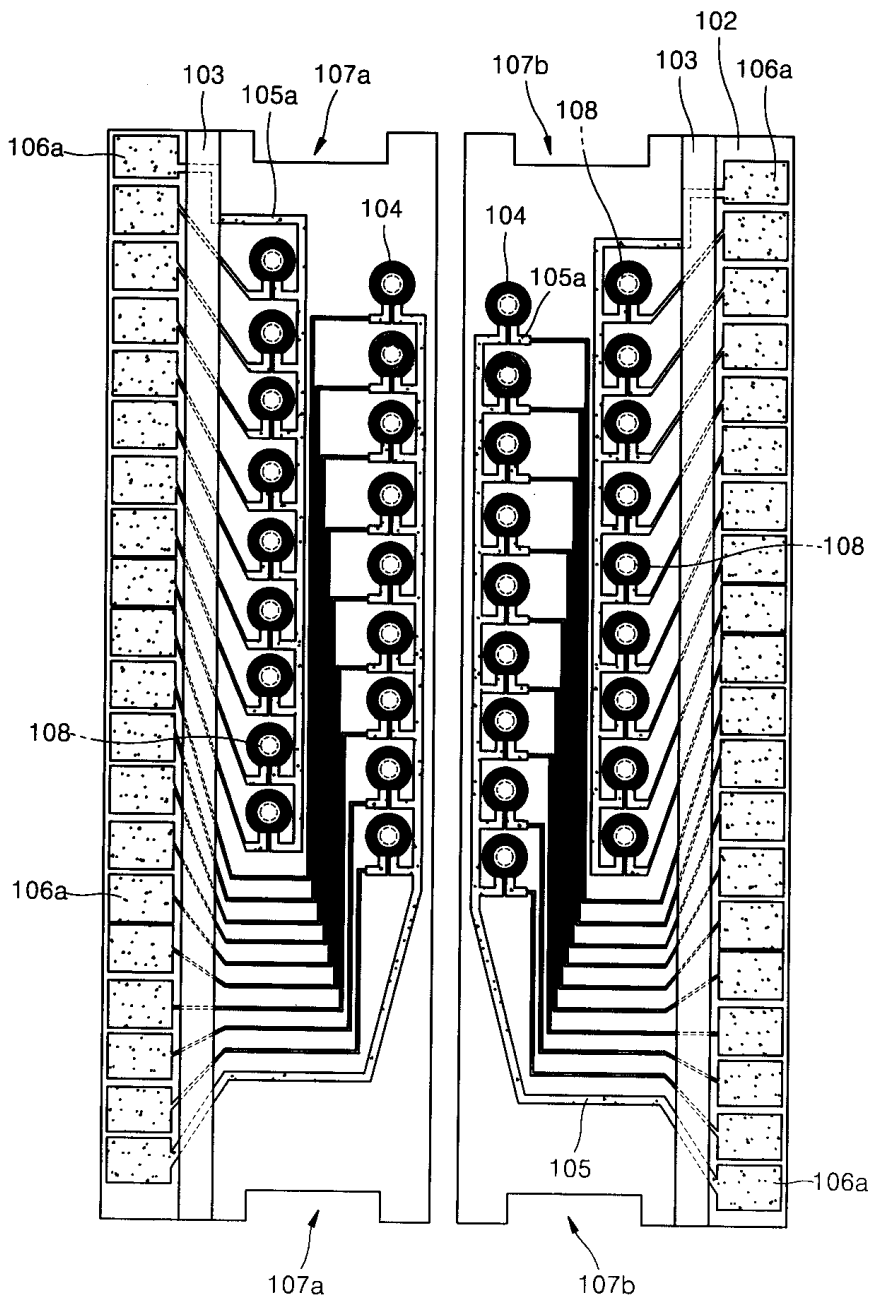
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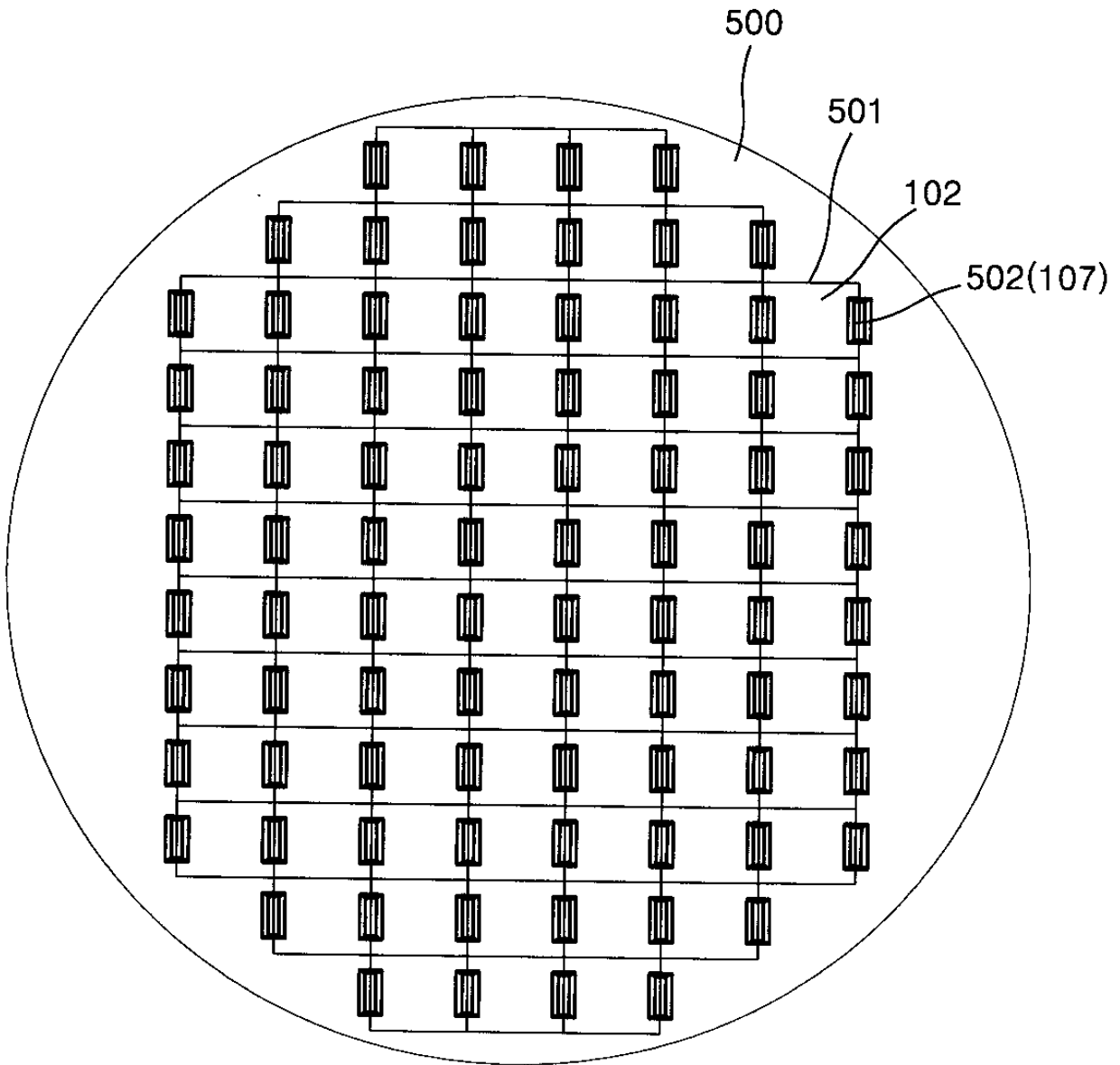


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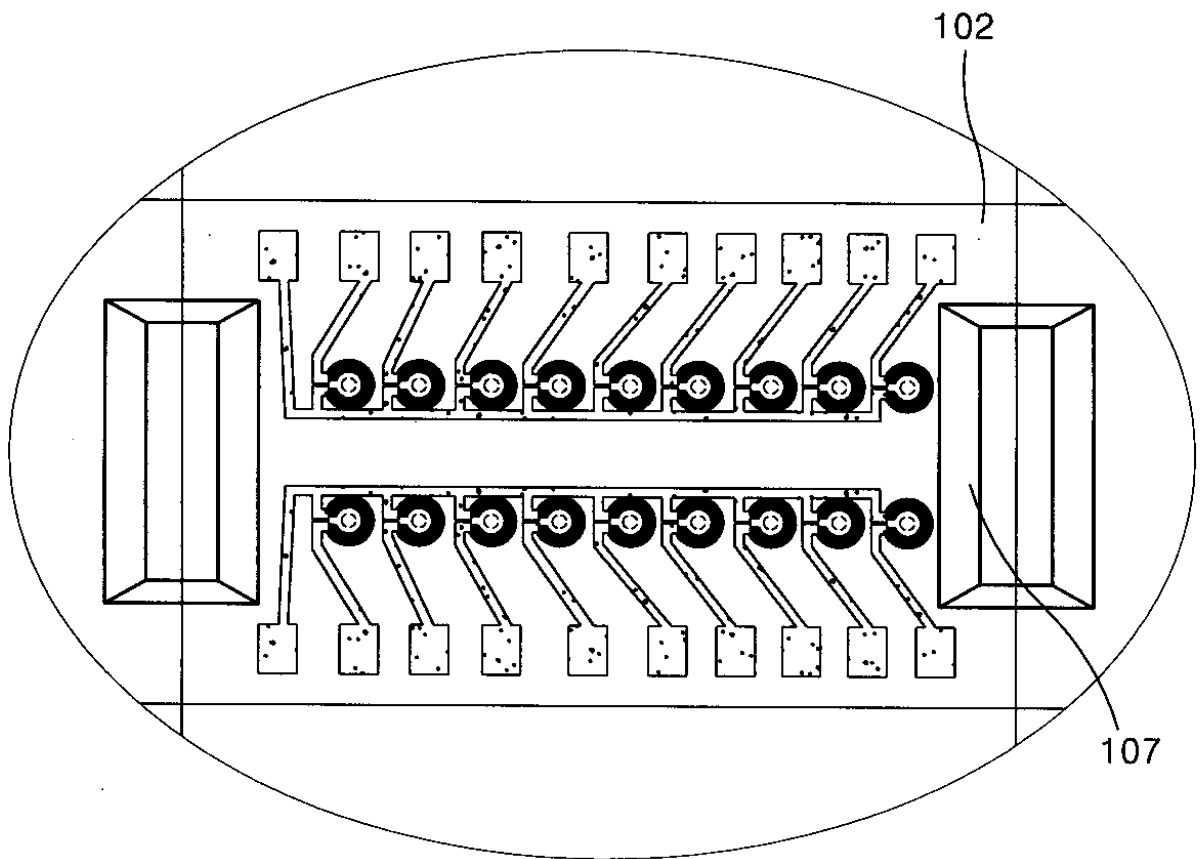


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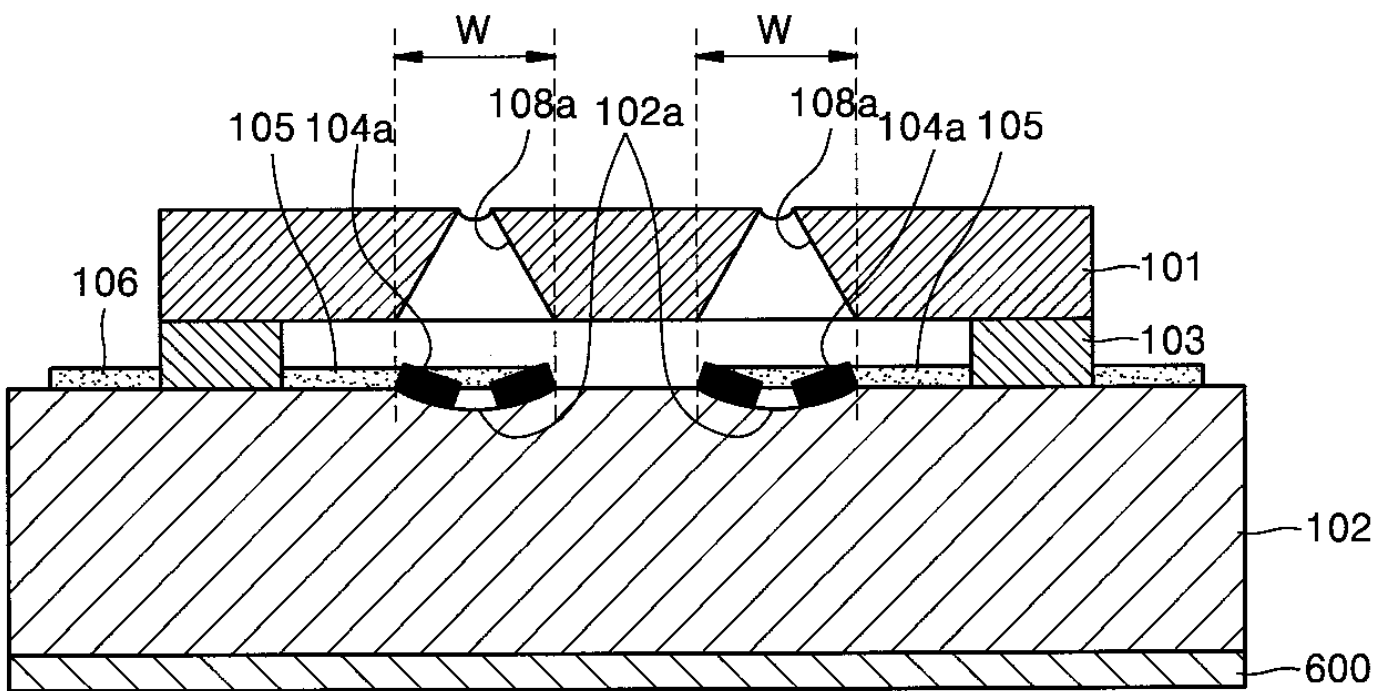




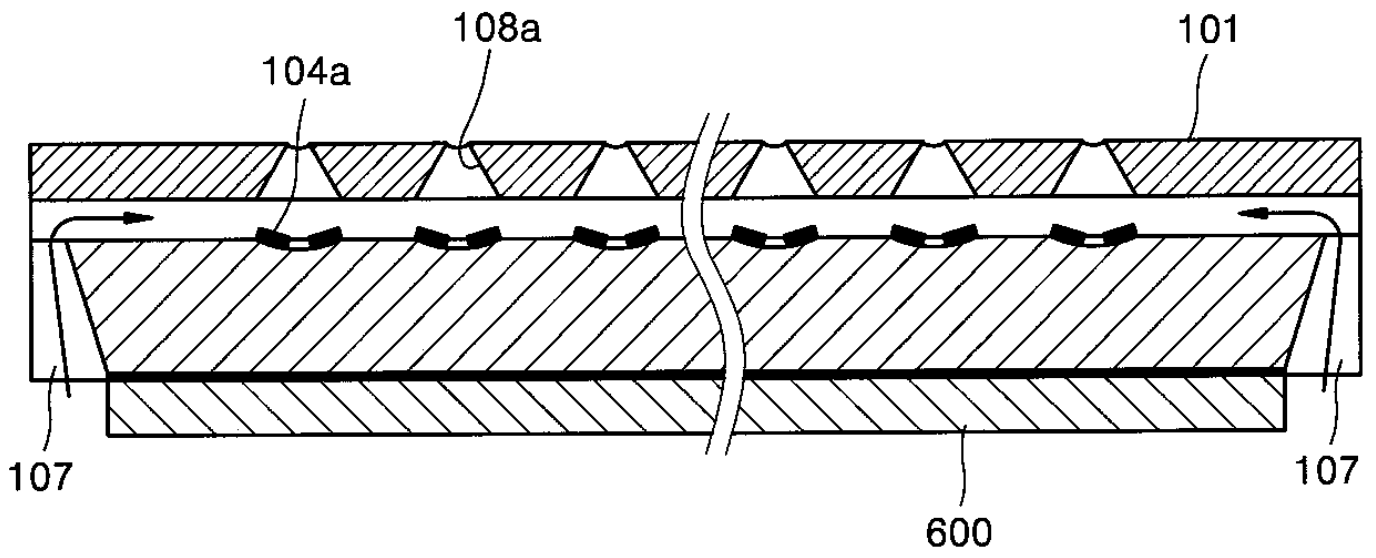
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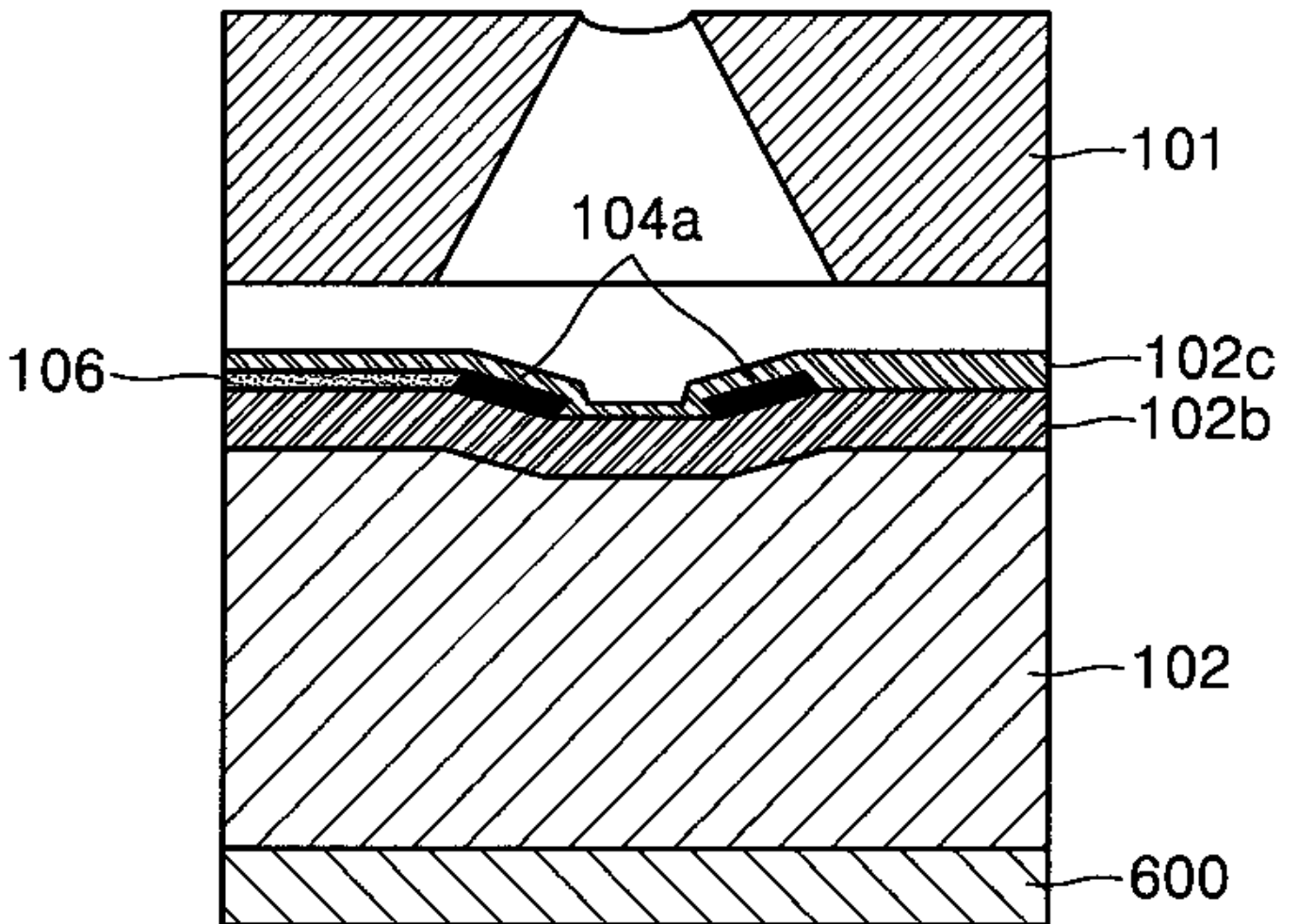
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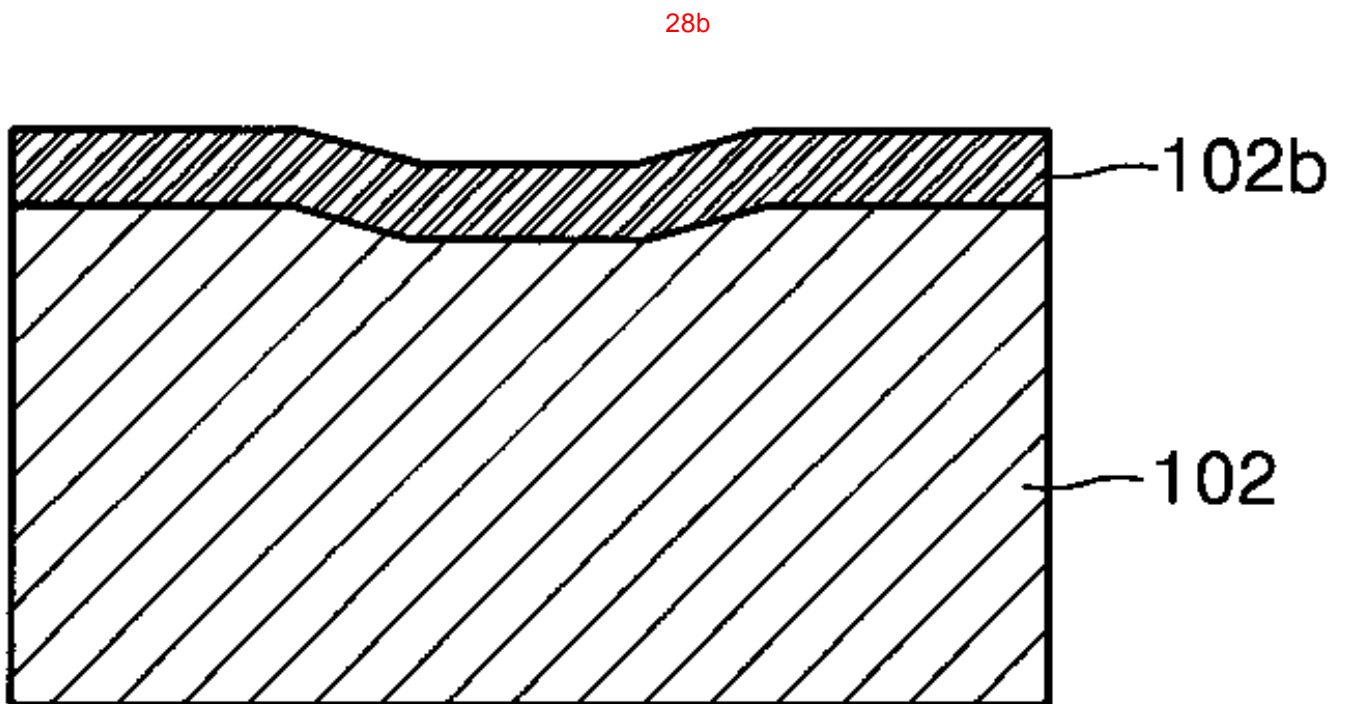
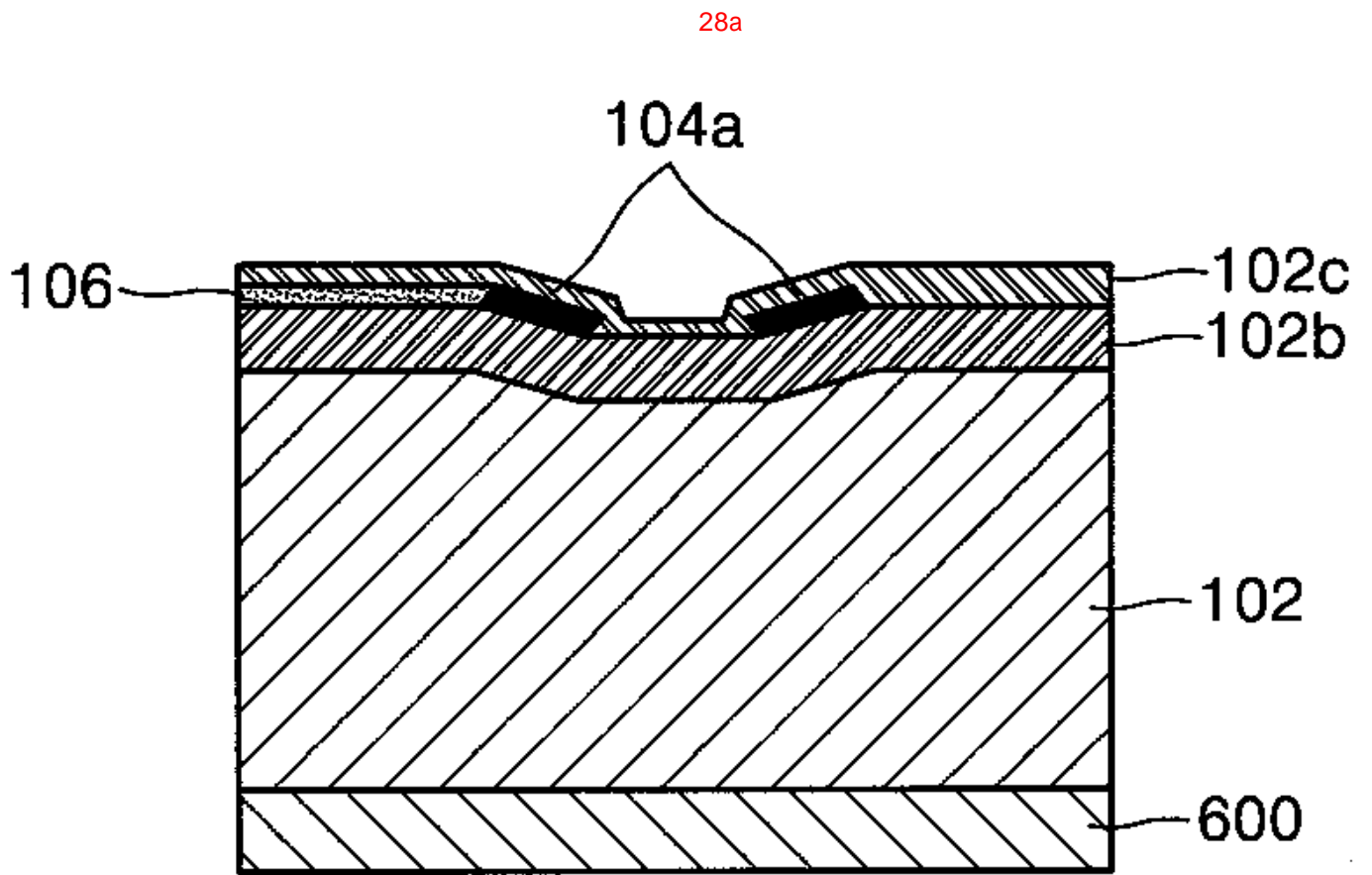


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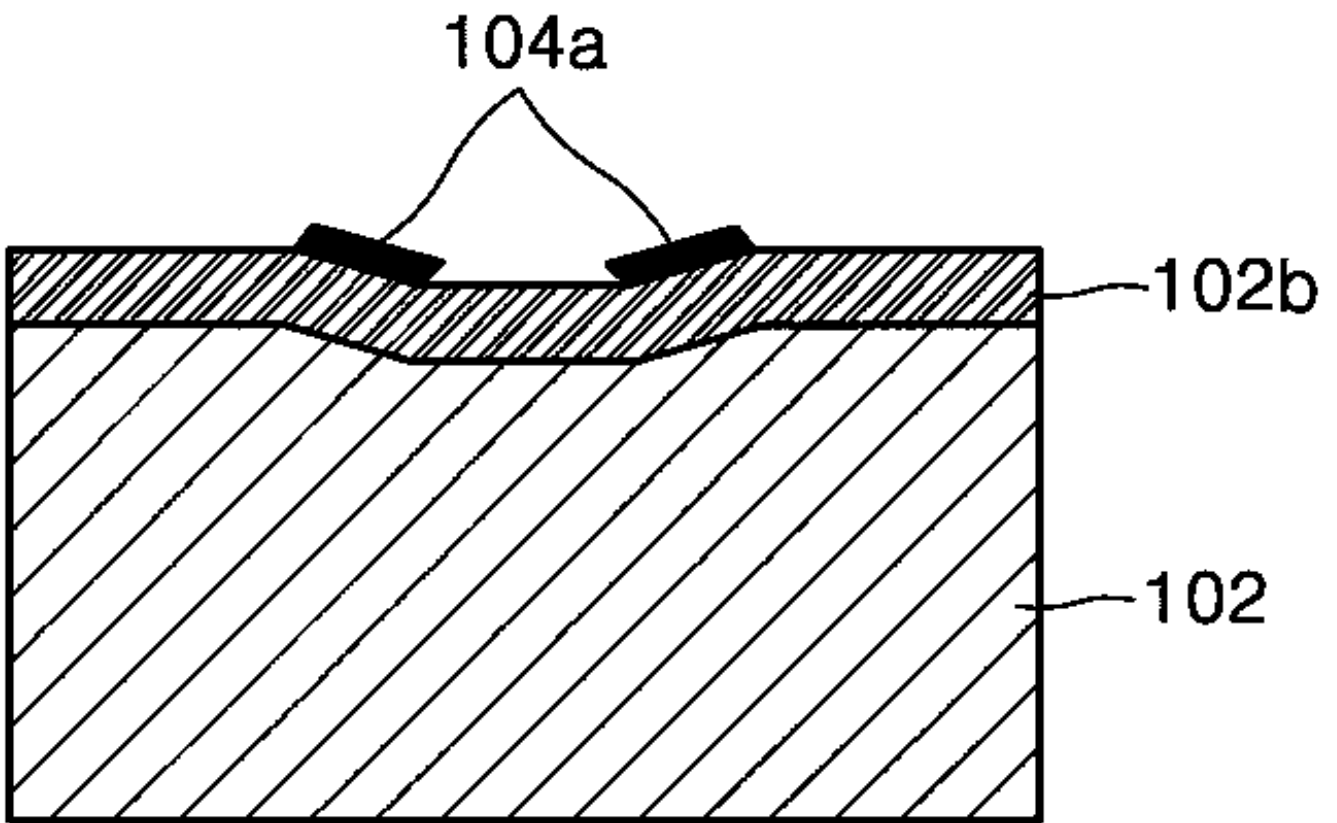


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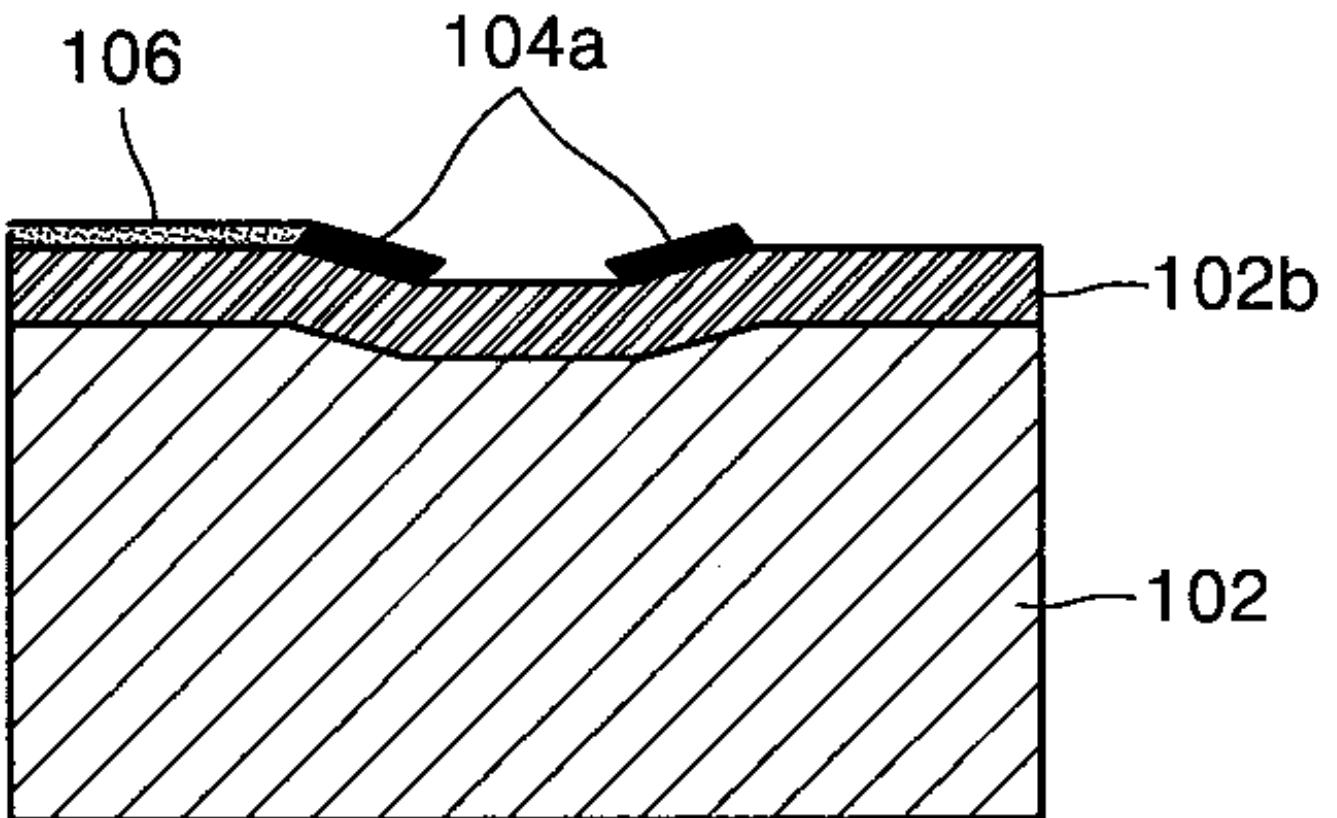




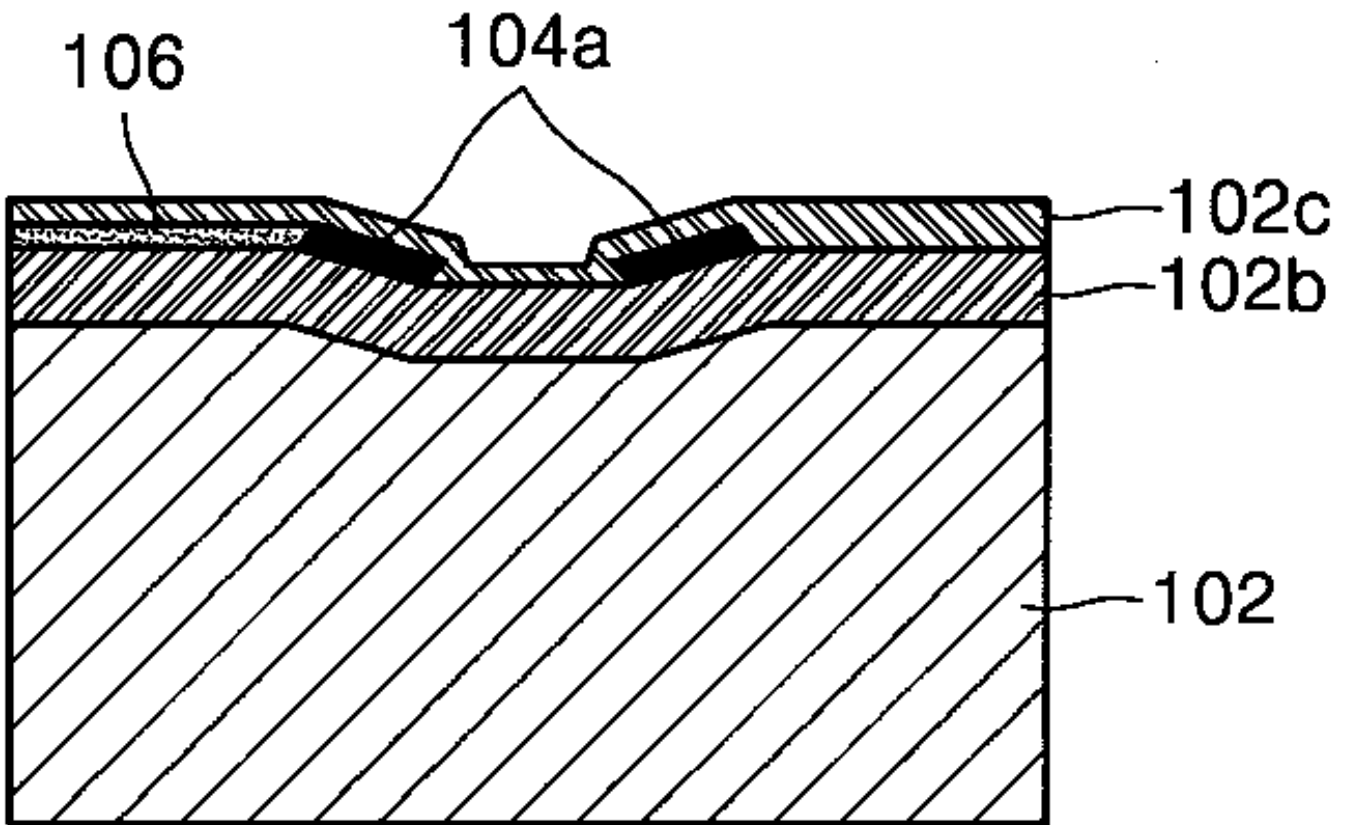
28c



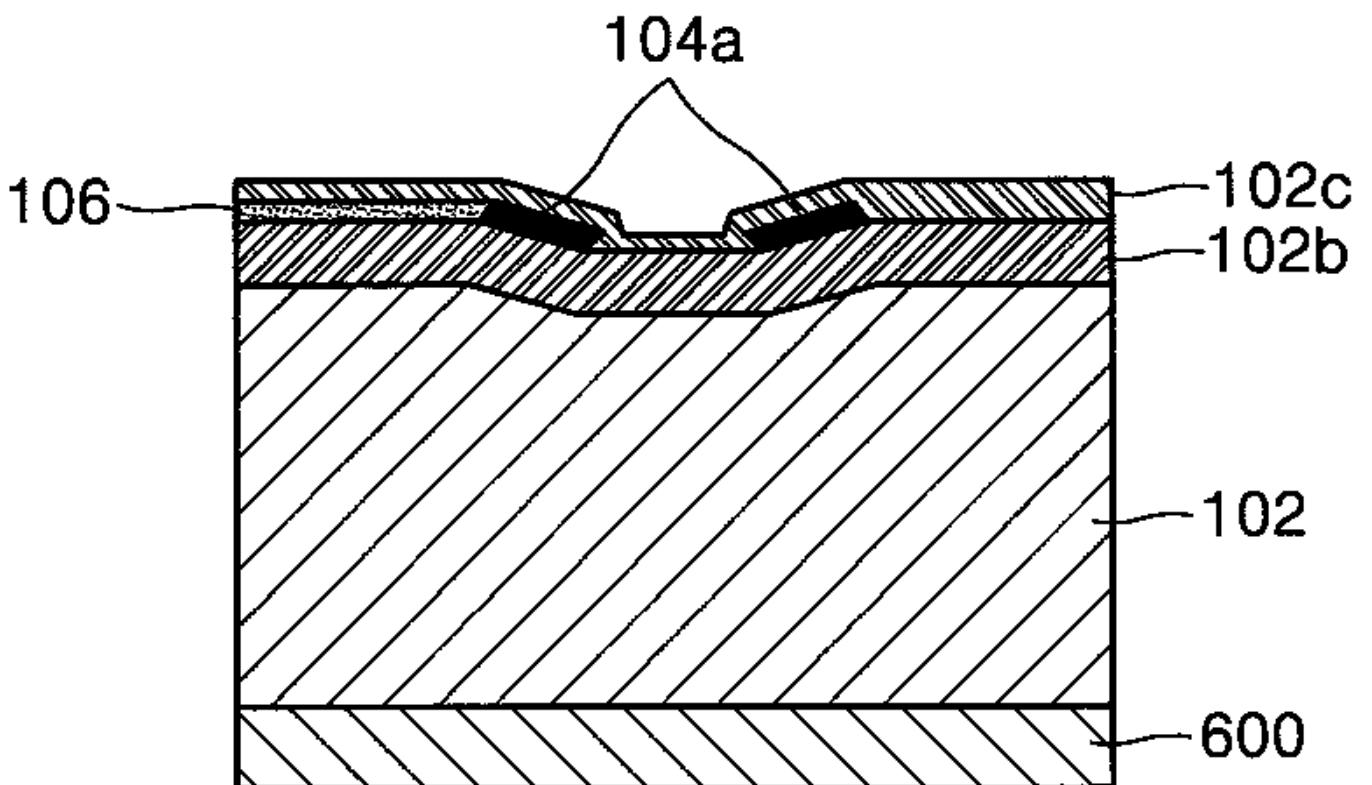
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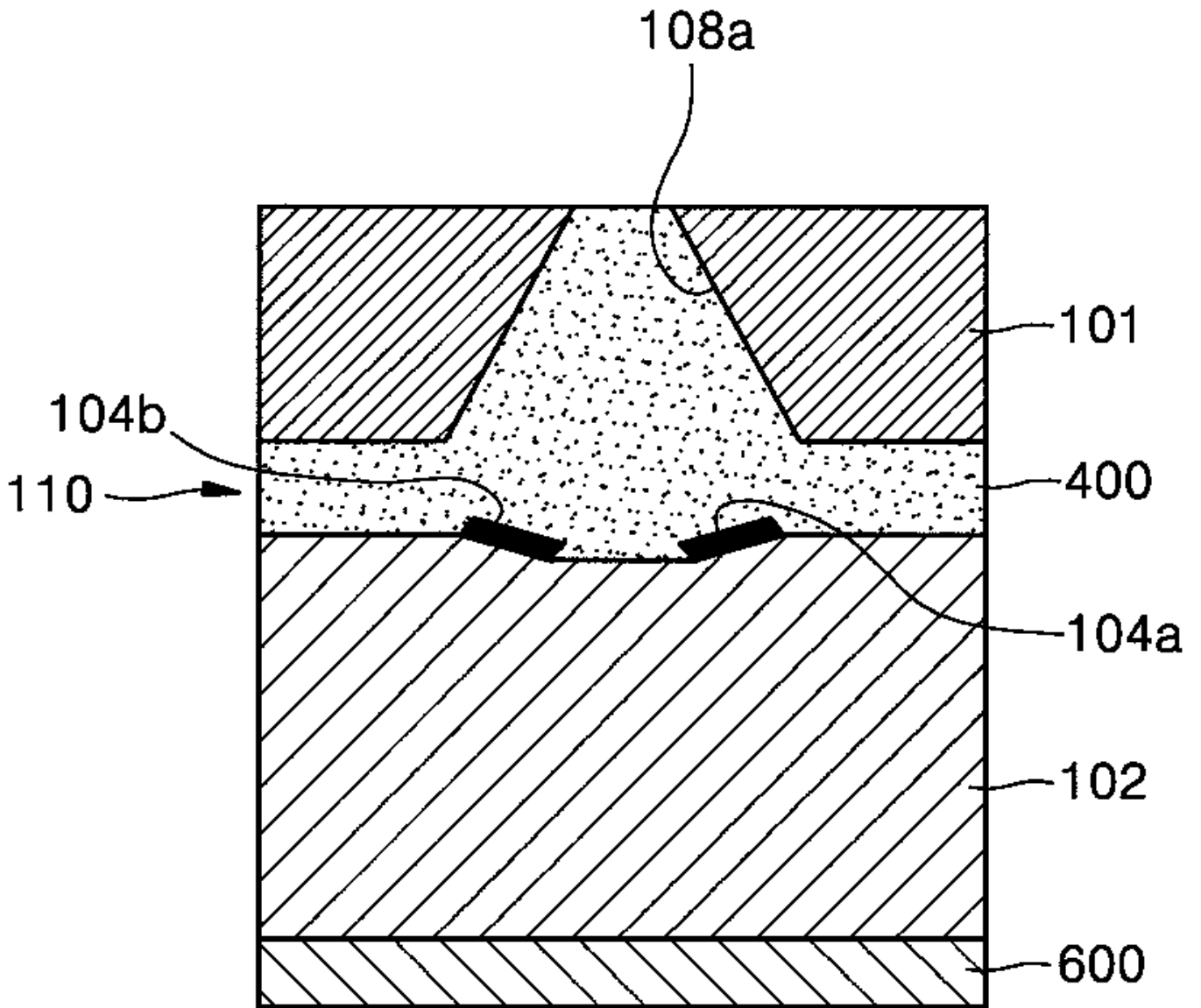
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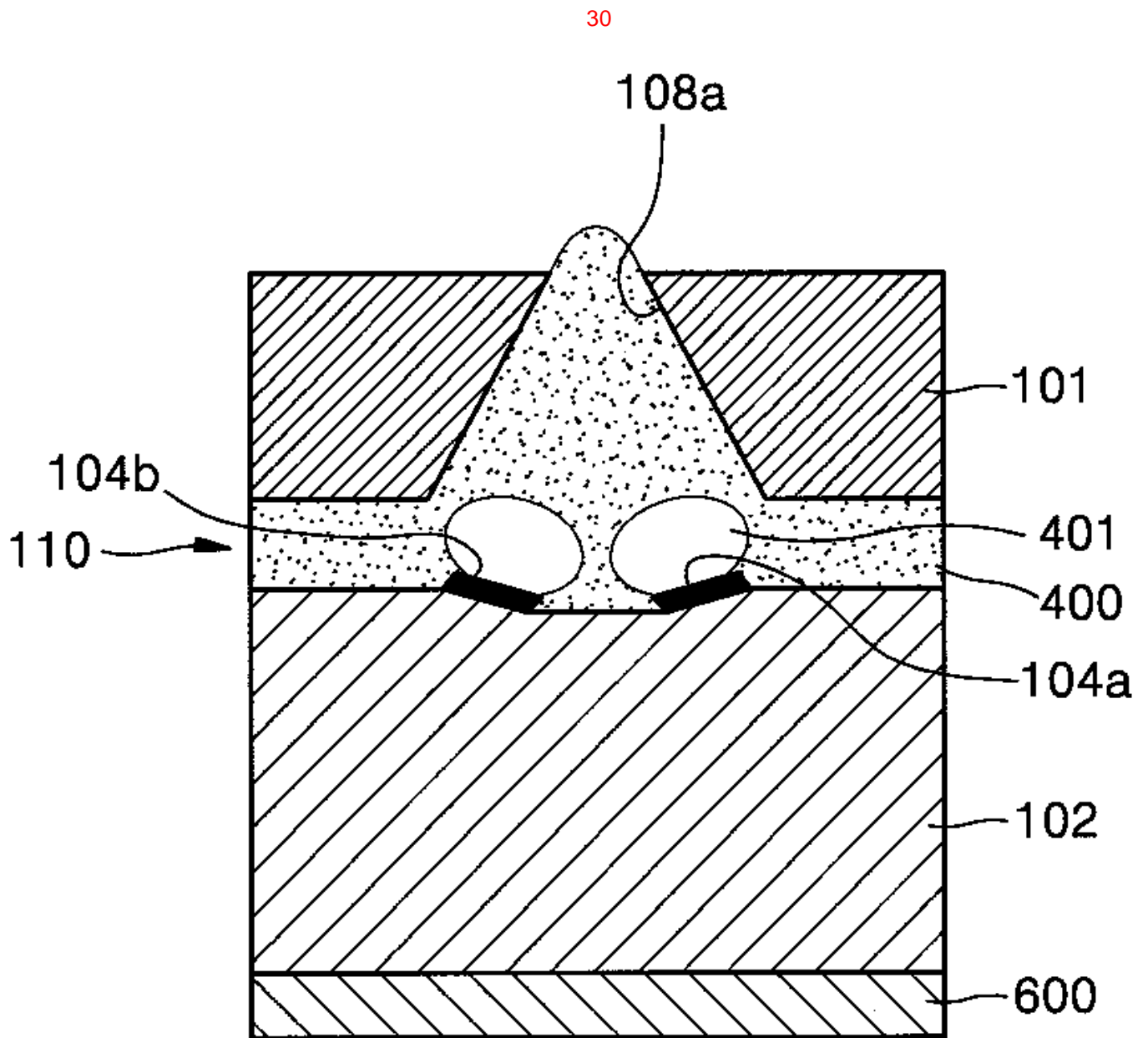


28f



29





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