

(54)

가 (1, 2) 가 (10),
가

4

가

가

가

가

[(filtration air cleaner, FAC)] (plate)
[(electrostatic precipitation air cleaner, ESPAC)]

FAC

1.

2.

가 (fan)

3.

4.

가

ESPAC :

- 1.
- 2.
3. 가

ESPAC .

1. 가 . , () 가
2. 가 .
3. .

ESPAC (gas stream)

1 , , (gas stream)가 가

(particle precipitation device)가 가

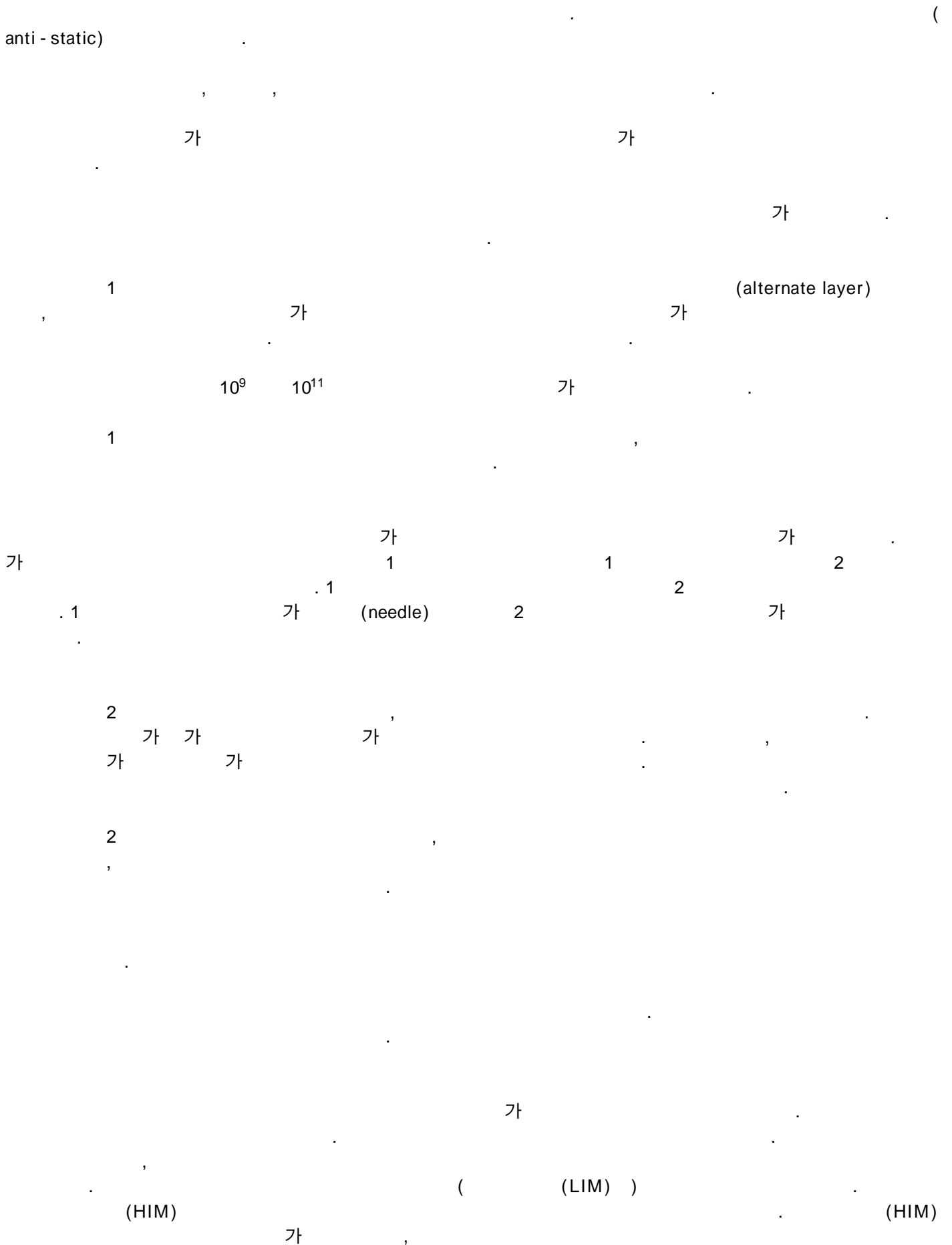
2 , (electret) 가 가

가 (fluted) 가 (concertina)

가 .

, PET, PTFE , (copolymer)

1 , 가 .



가 ,

(HIM)

HIM

가

()

HIM

HIM

HIM

가

가

(non - woven)

가

()

가

가

(P

E),

(PP),

(co - polymer), PVC, PET, PTFE,

가

()

가

()

1 1 ,
2 2 ,
3 3 ,
4 (A) (B) 4 ,
5 5 ,
6 ,
7 ,
8 ,
9 9 ,
10 ,
11 10 ,
12 11 ,
13 12 ,
14 ,
15 ,
16 17 ,
18 ,
19 13 ,
20 14 ,
21 1 ,
22 2 ,
23 3 ,

24 4 ,
 25 15 ,
 26 16 ,
 27 17 ,
 28 18 ,
 29 ,
 30 .

1 8 , ,

1 , (particle precipitation device) 2 (1, 2)(
 2) (3)가 .

(1) (HIM) 가 , 1mm , (

1) HIM (anti - static) (HIM) 10^6 10^{11}
 가 (LIM) $50\mu\text{m}$ 10 1000
 0.1 1.0 $50\mu\text{m}$ 10^{13} 10^{16} .
 가 .

(4) (1) (5) (5)
 . HIM (5)
 가

(2) HIM (2) (5) (4)
 . (2) 가 , ,

, 13 HIM 가 4mm 0.4mm
 100mm 가 . 2.0m/s . HIM
 DC - 13kV 500 μg 93% 0.5 μm

2() , HIM (1) (8) .

(8) , ,

(7) , , -

3 , (1) (7) (8) .
 (8) .

(8) .

2 가

4 (A) (B) , (9)

(9) , P.T.F.E
 4 (A) (flute) 4 (B) 가
 4 (A) (9) (10)
 (9) (9) 가

(HIM)

(9)

4 (1) (2) 가

, 410mm, 100mm HIM
 (insulating plastics twin - wall fluted sheet material, IPTFSM)
 HIM 0.13mm IPTFSM 4mm 가 IPTFSM 0.4mm
 (0.5 μ m HIM 500 μ g DC - 10kV)
 가 1.8m/s (clear air delivery rate, CADR)
 717m³

(4) , 가

(9) (9)

(9)

(11)

(9)

가 가

6, 7 8 ,

12 .

13

9 가
 (30a, 30b)

(10)

(concertina)

(30b)

(30a, 30b)

(30a)

가

(36, 38)

(36)

0.1mm

가

z

가

(

0.5mm

2.0mm

)

가

(38)

(36)

가

(38)

(diffusion charging)

가

(z)

[

(mono - polar charging)]

11

(42, 44)

(40)

(40)

(42, 44)

12

(42, 44)

(50)

13
64)

(60)

(fold)

가

가

(62,

14

(72)

(70)

(

)

(x, y, z)

()

()

)

(y)가 가 , 가
 가 가 가 ,
 가 가 가
 0) (82), () (84) 가 , 15 (8
 (86) (8
 가 ()

16 (100) 17
 (102), (100) (100)
 (104) 가 (4 (B))
 (100) (106) (108)

가 () (112, 114)(18)
 ()

4 (B) , (

가 ,
 (dielectrophoresis) (deposit)
)

19 ,

(122)

(120)

10⁹ 10¹¹ 가

4 (B)

2.1mm , 2.7mm 150μm 가 300g
80g.s.m.

70mm - 12,00
0V

1mg 0.5μm 10

(m/s) (%) ()

0.5 99.993

1.0 99.977

2.0 99.9514

3.0 99.2327

5 (10)

(9) (11) " " (11)

(9) (9) 가 (9)

가 (10) 가 가

(200) (5)

가 ()

20 () (10) ()

(anti - static) (198) 가

(202),

20

300g , 2.1mm

, 2.7mm

150 μ m

(10)

가

15

- 33,000V

20

70mm

가

0.5 μ m

1mg

:

(m/s)

(%)

()

1 936

2 8813

3 8426

4 7937

5 7452

1mg

:

(m/s)

(%)

()

1 996

2 9913

3 9926

4 9837

5 9652

가

가

(10)

21 (212) (21)

22 , (214) (216)

가 가 가 , 가 가 가 (dielectric breakdown)가

(10)

23

(220)

(222, 224)

(222)

(224)

가

24 ,

(230, 232)

(10)

가

, 5

25가

(302, 304)

(3

00)

, 26

L

(306)

(300)

27

(312, 314)

(310)

(300)

(310)

28

29

(20)

. (10)

가

(198)

| | (A1) | (A2) | (400) | (30) |
|-----------|-------------------------|------------------------|-----------------------|------------|
| 6) | (406) (410) (406) | (402) (412)가 (A) | (404)가 20 (408) | (40) |
| harging)] | (410)가 | | [| (field - c |
| | 가 | (406) | | |
| |) | (가 | 가 | (|
| 30 | | | | |
| 00V | | 100mm | | -6,0 |
| | | 70mm | | 4.5μA |
| | (μg/m ³) | (nA) | | |
| | 10006.2 | | | |
| | 8005.0 | | | |
| | 6003.7 | | | |
| | 4002.5 | | | |
| | 2001.3 | | | |
| | 00.0 | | | |

(57)

1.

(gas stream)

(particle precipitation device) ,

가

,

,

가

,

가

2.

1 ,

가

(fluted)

3.

2 ,

가

4.

2 ,

(concertina)

5.

2 ,

6.

2 ,

7.

1 ,

8.

7 ,

가

9.

7 ,

가

10.

1 ,

11.

1 ,

12.

1 11 ,

13.

1 11 ,

14.

2 3 ,

가

15.

12 14 ,

16.

15 ,

17.

12 14 ,

18.

12 14 ,

(anti - static)

19.

13 14 ,

, ,

20.

1 19 ,

가

가

21.

1 20 ,

,

(copolymer),

, PET, PTFE

22.

1 21 ,

가

23.

22 ,

24.

22 ,

25.

22 ,

(alternate layer) ,

가 ,

가

가

26.

1 25 ,

27.

1 12 14 26 ,

10^9 10^{11} 가 .

28.

1 27 ,

,

가 .

29.

1 28 ,

가

가

30.

29 ,

가 2 1 1

31.

30 ,

1 2 .

32.

30 31 ,

1 가 (needle) 2 가

33.

(electret) 가 가

34.

33 ,

35.

34 ,

가

36.

34 ,

(concertina)

37.

34 ,

38.

34 ,

39.

33 ,

40.

39 ,

가

41.

39 ,

가

42.

33 ,

43.

33 ,

44.

33 43 ,

(copolymer),

, PET, PTFE

45.

33 44 ,

가

46.

45 ,

47.

45 ,

48.

33 47 ,

가

가

49.

48 ,

가

1

1

2

50.

49 ,

1

2

51.

49 50 ,

1

가

2

가

52.

33 51 ,

53.

52 ,

가 가

가

54.

52 ,

가 가

55.

52 ,

56.

52 ,

57.

52 ,

58.

53 57 ,

59.

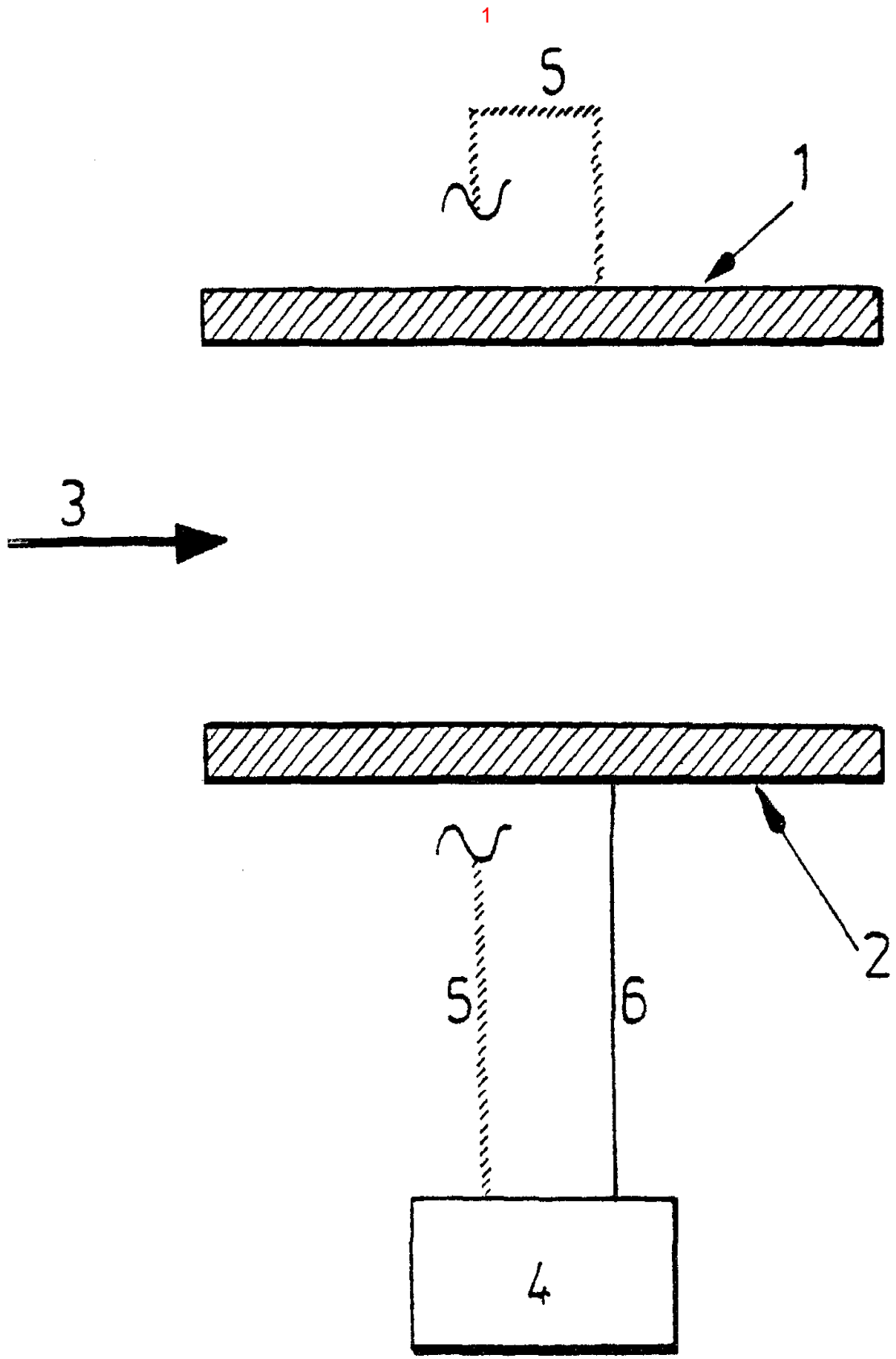
58 ,

60.

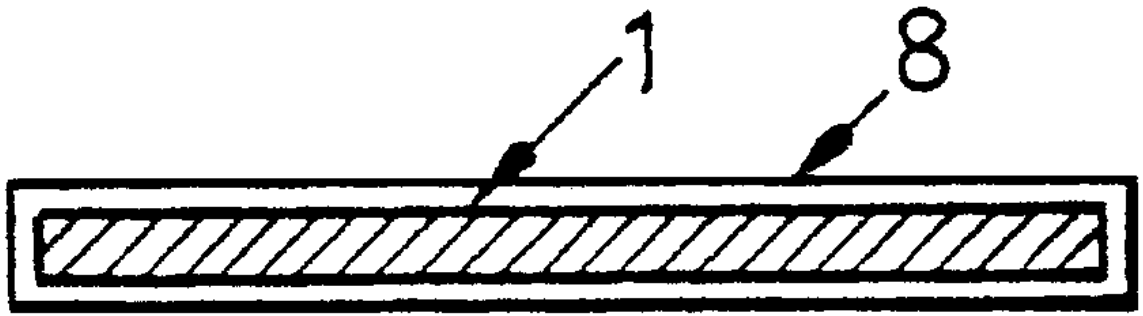
58 59 ,

61.

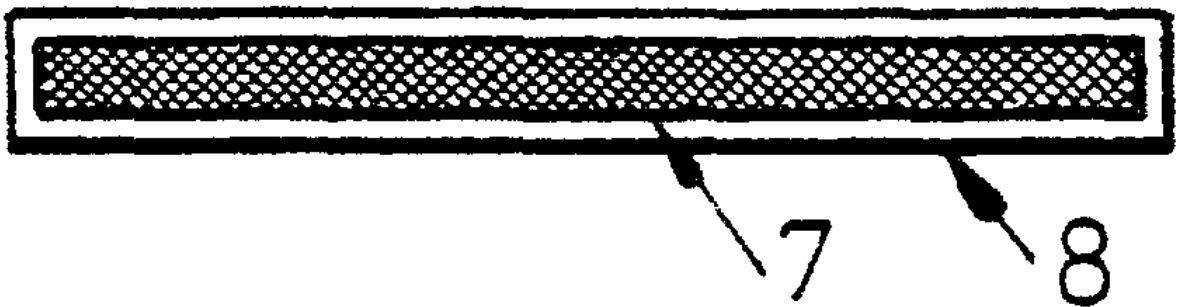
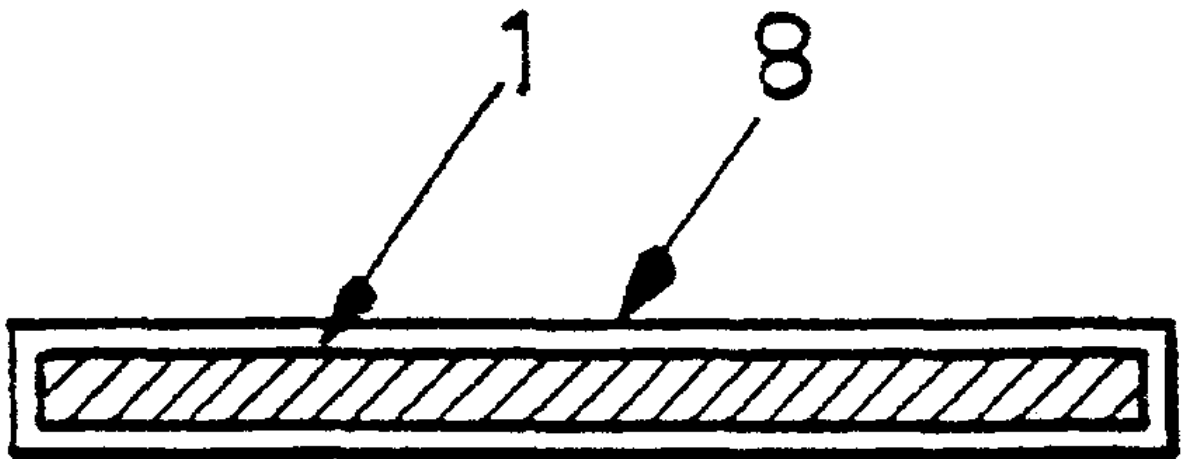
33 60 ,



2

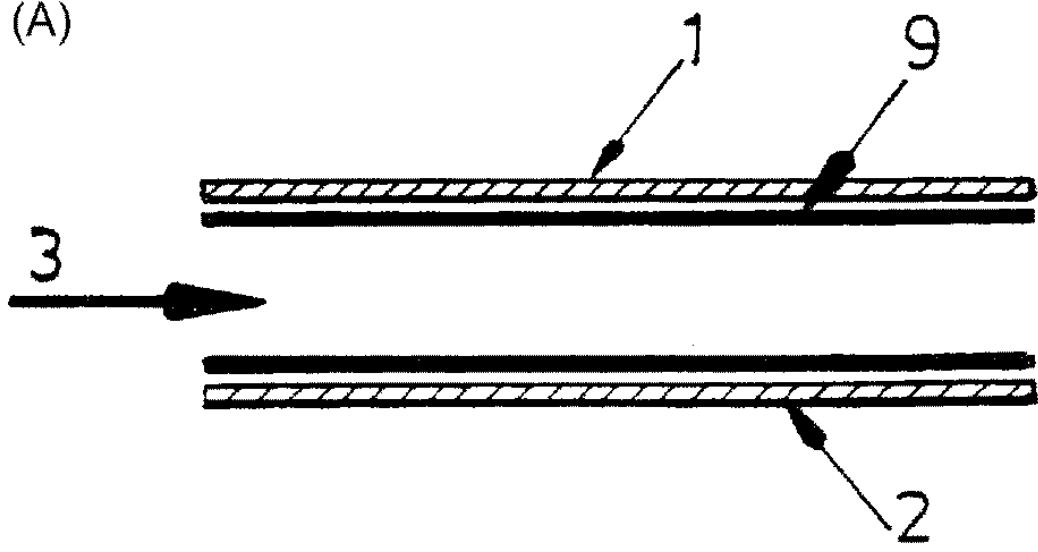


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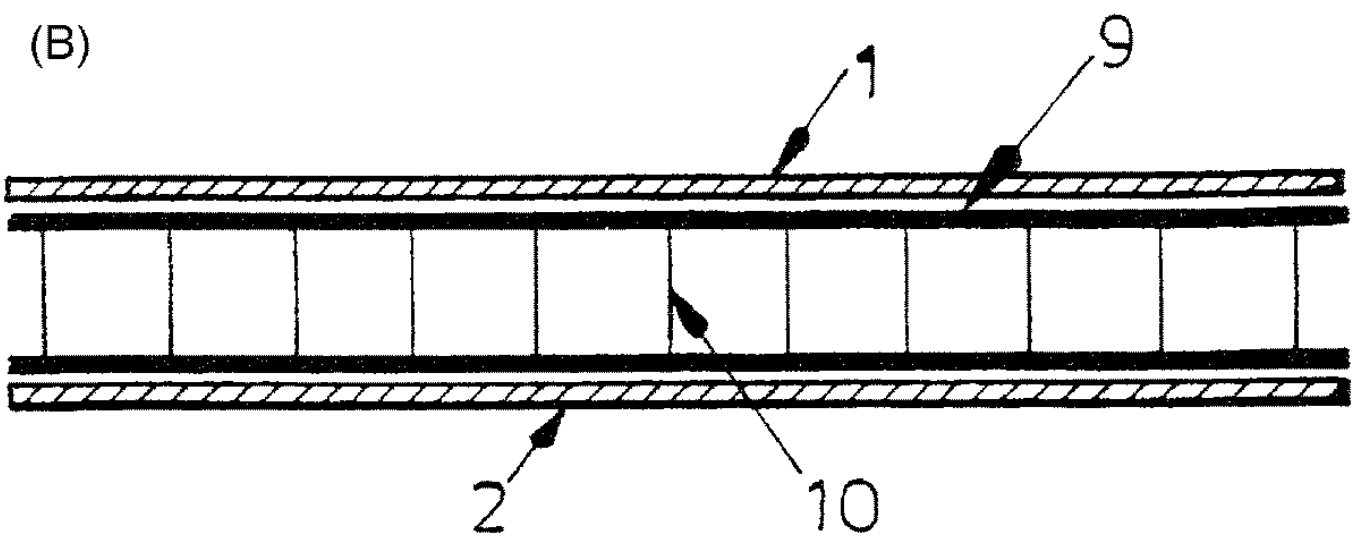


4

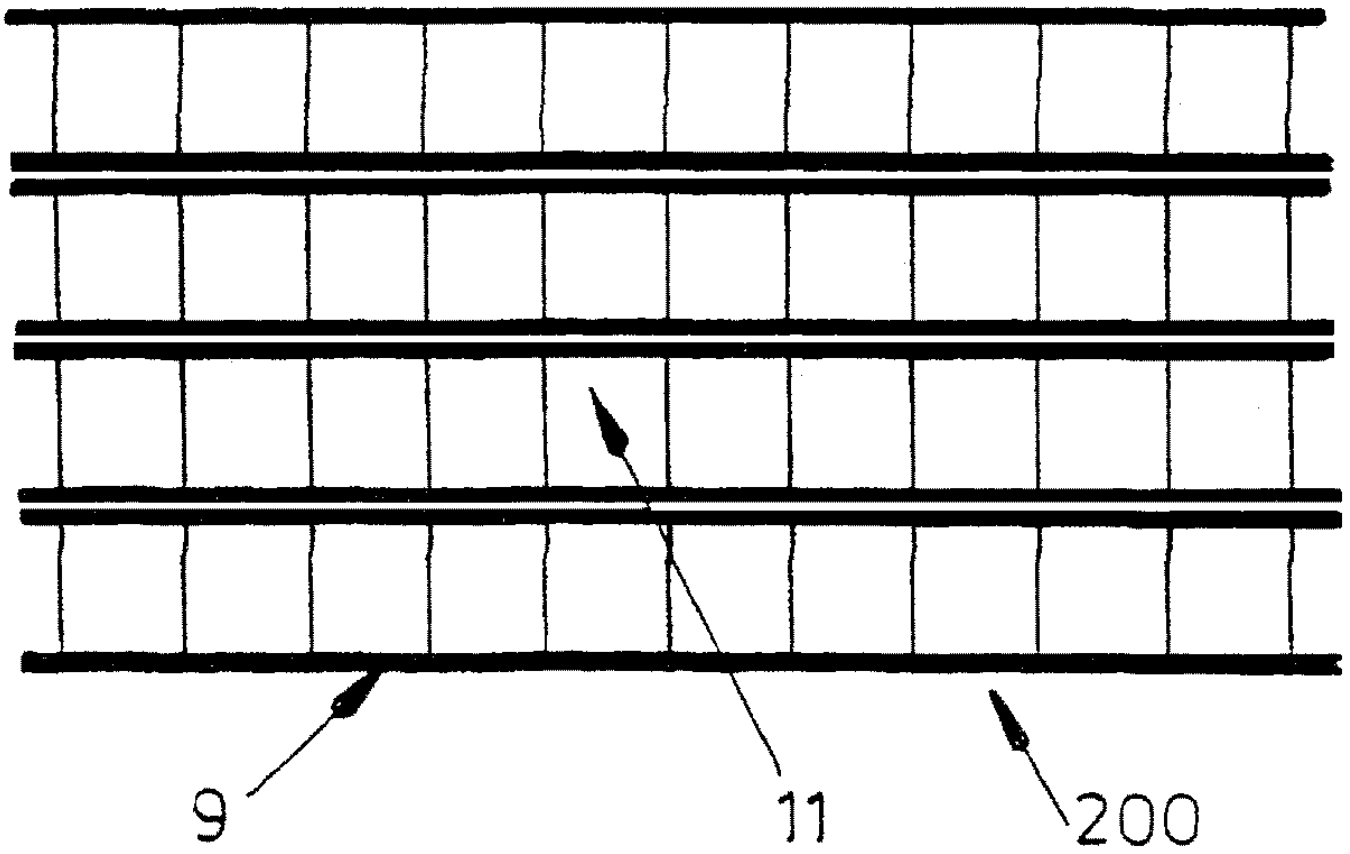
(A)



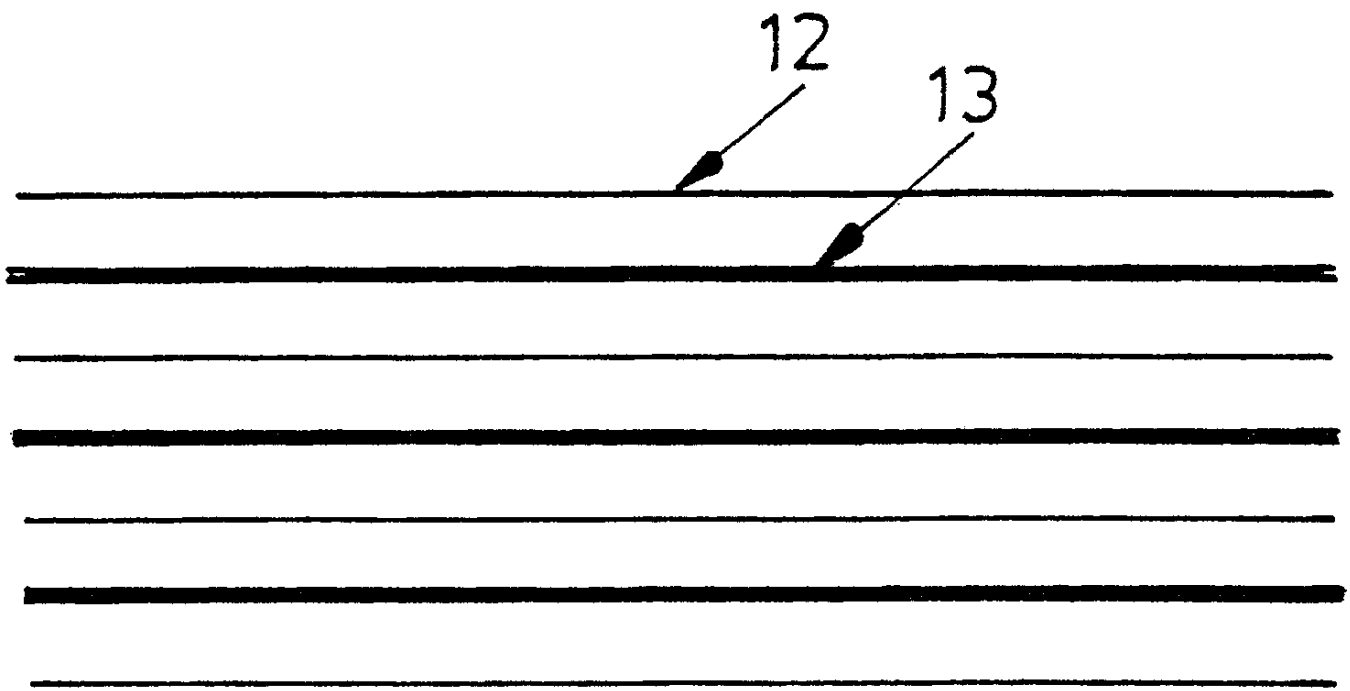
(B)



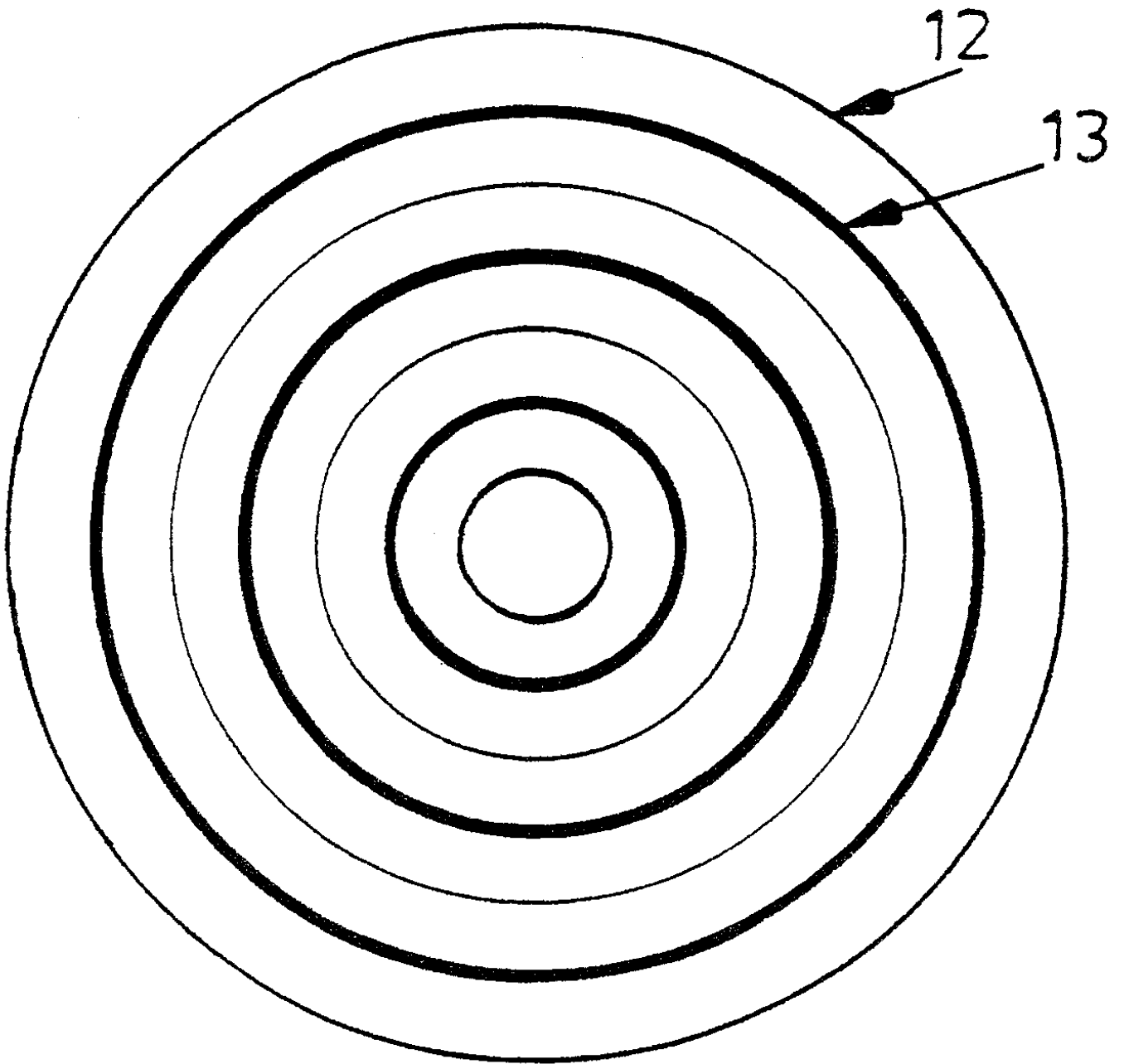
5



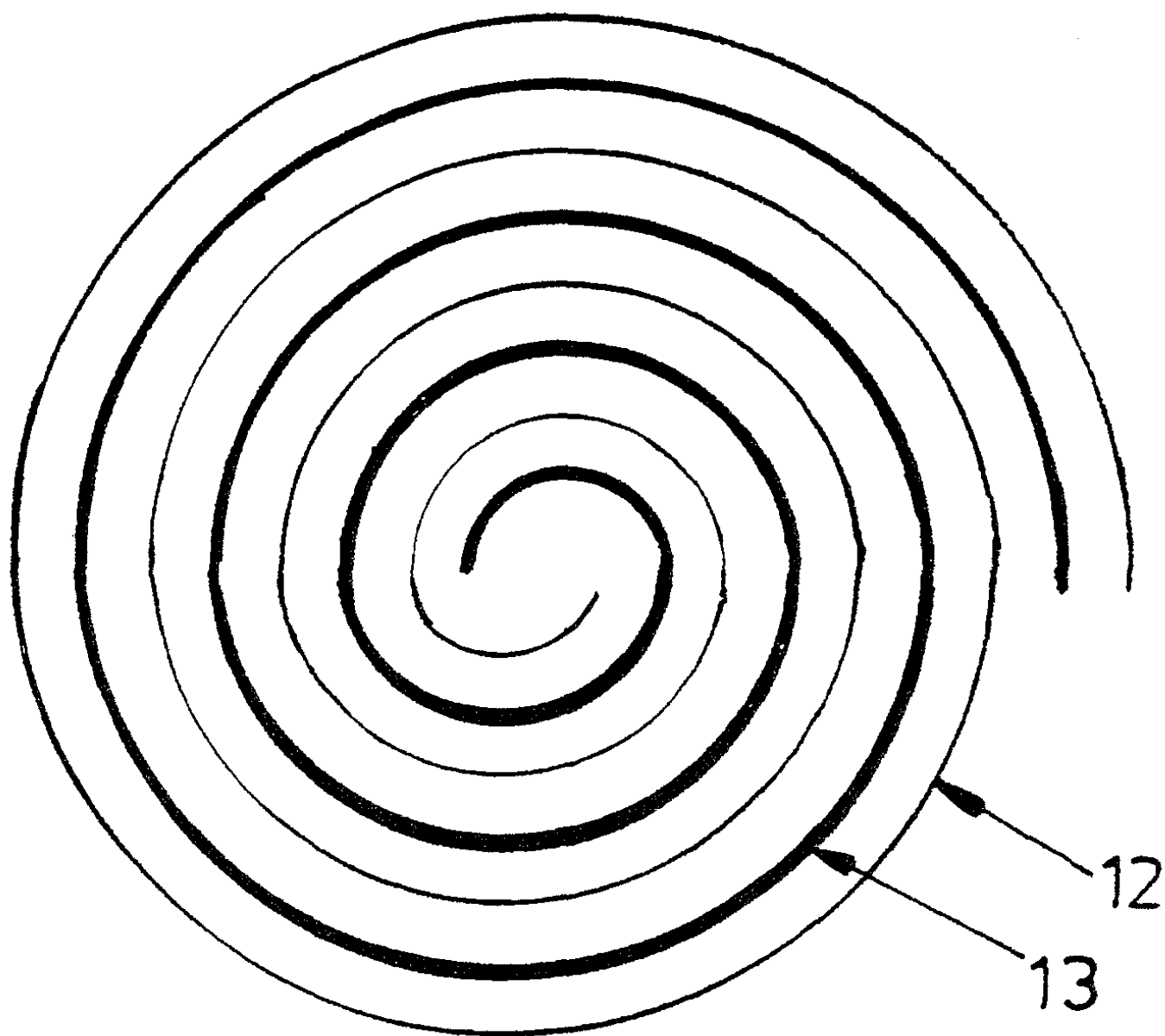
6



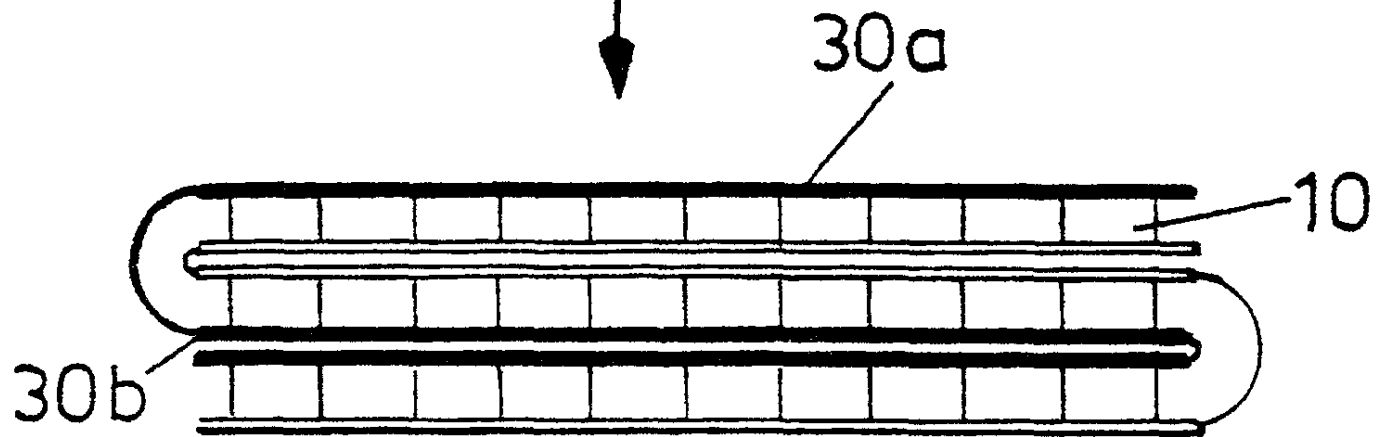
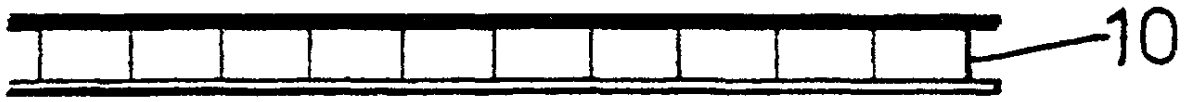
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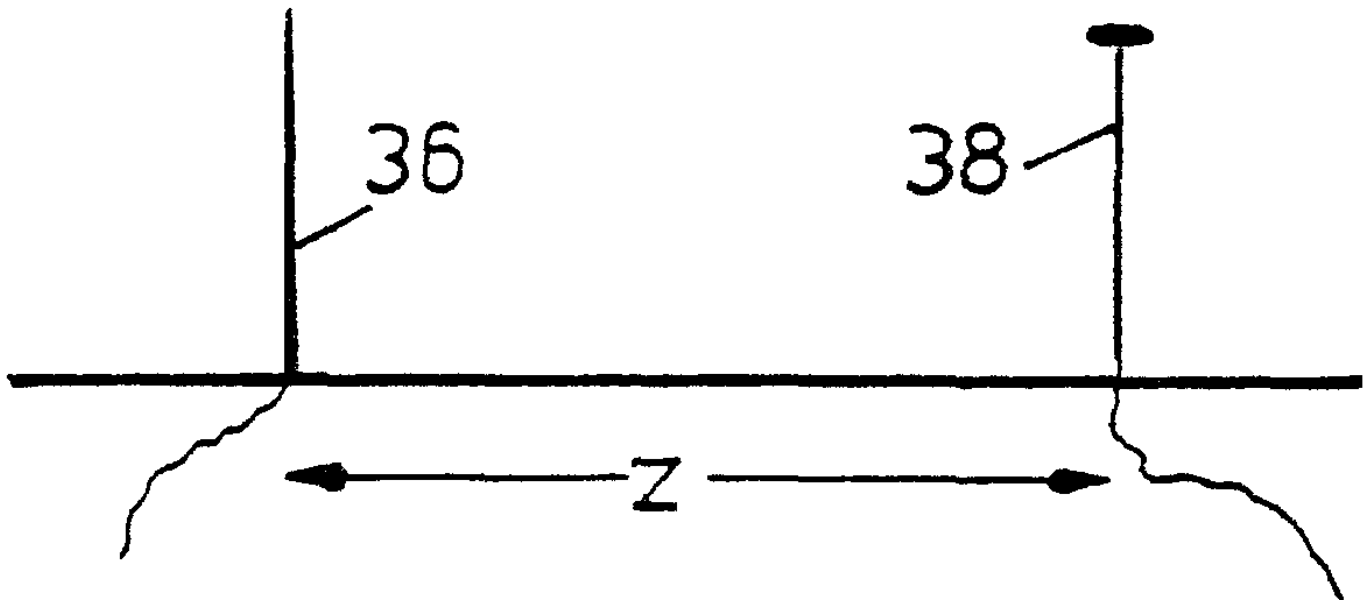
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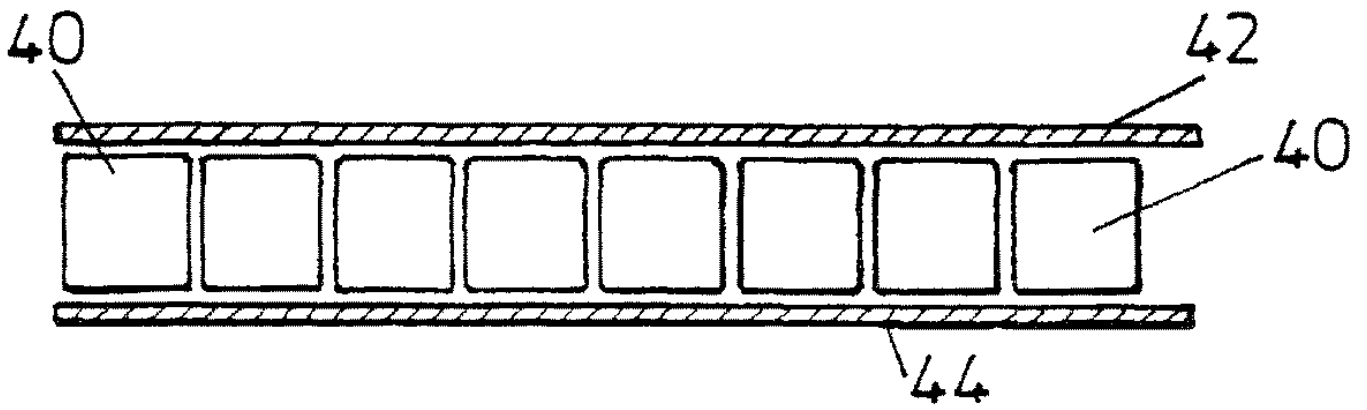
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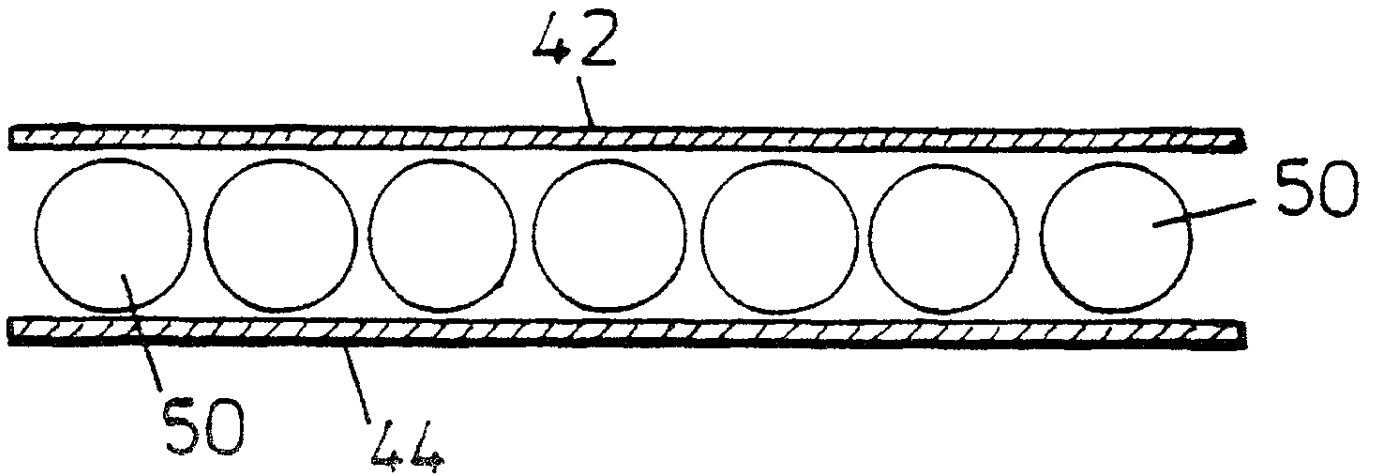
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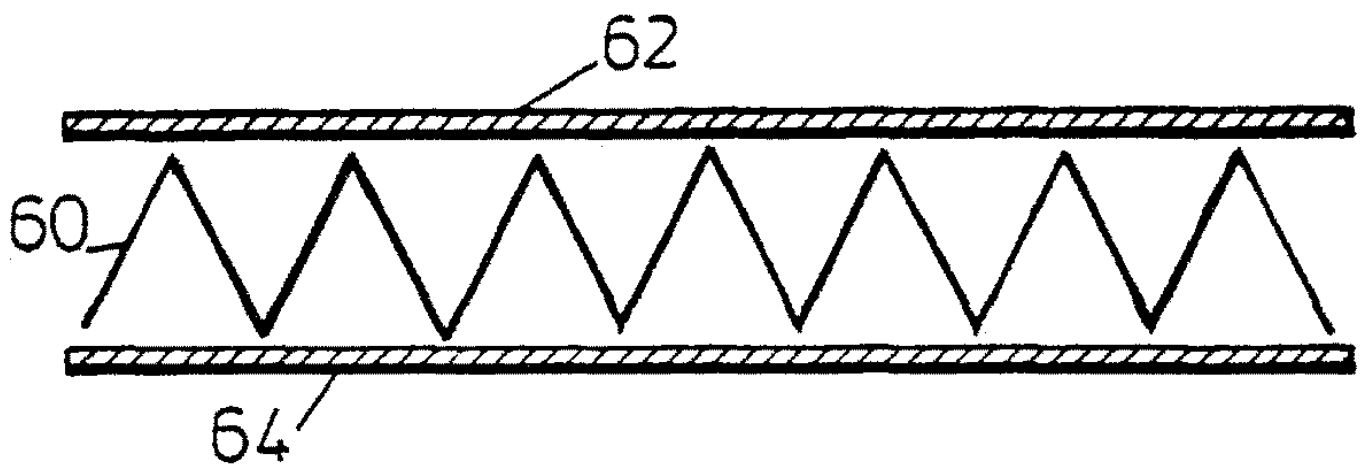
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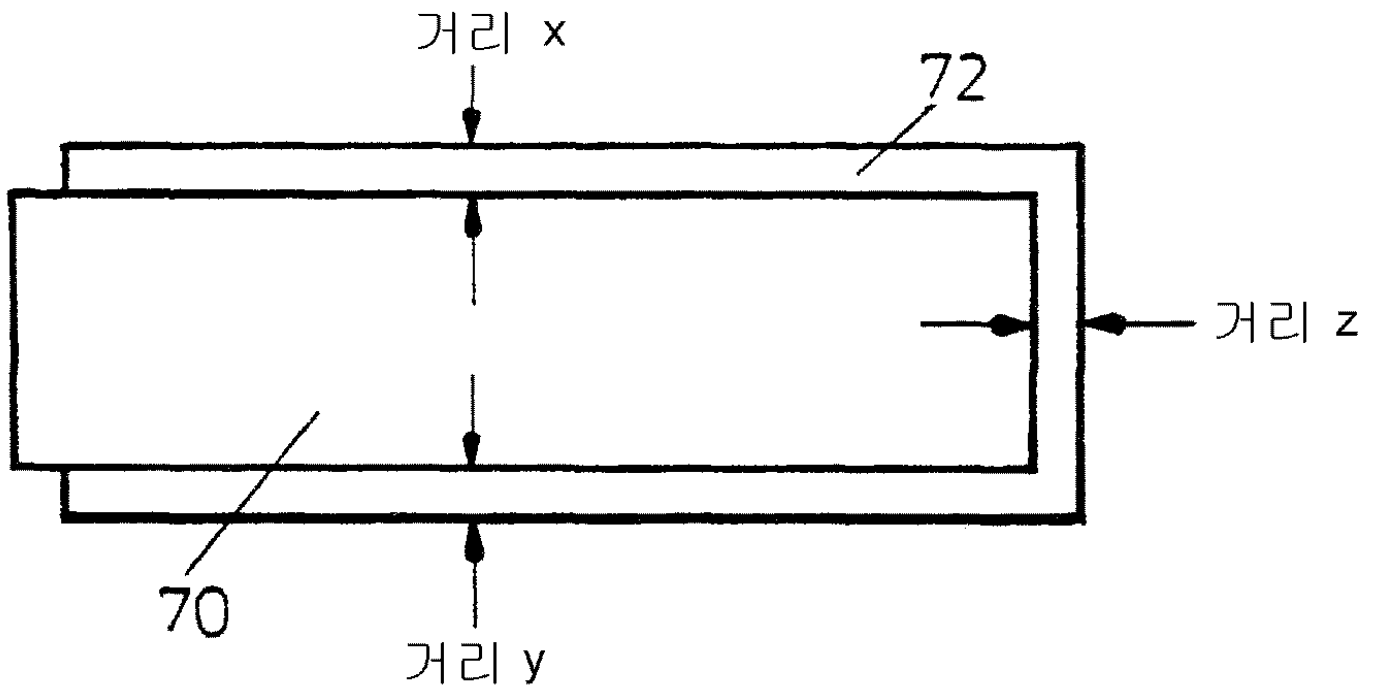
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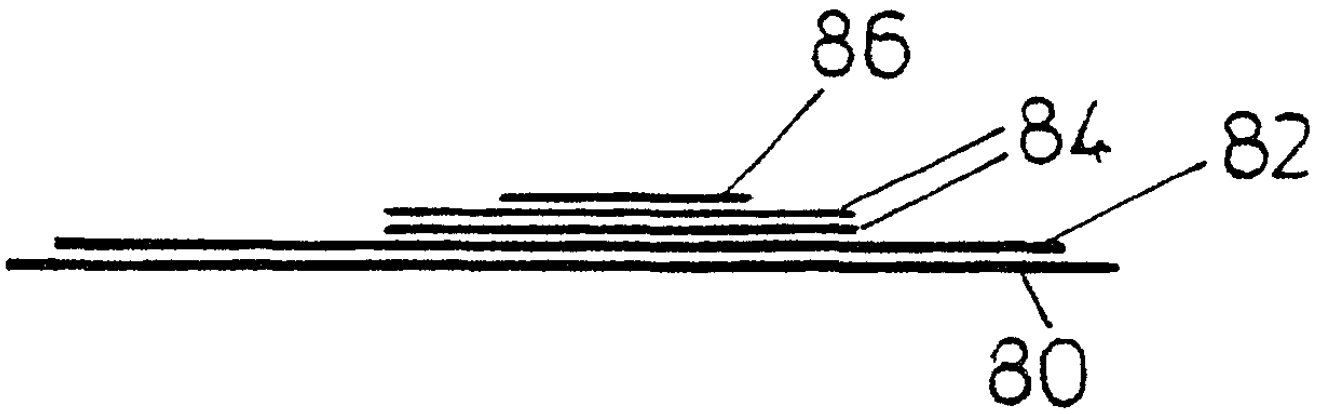
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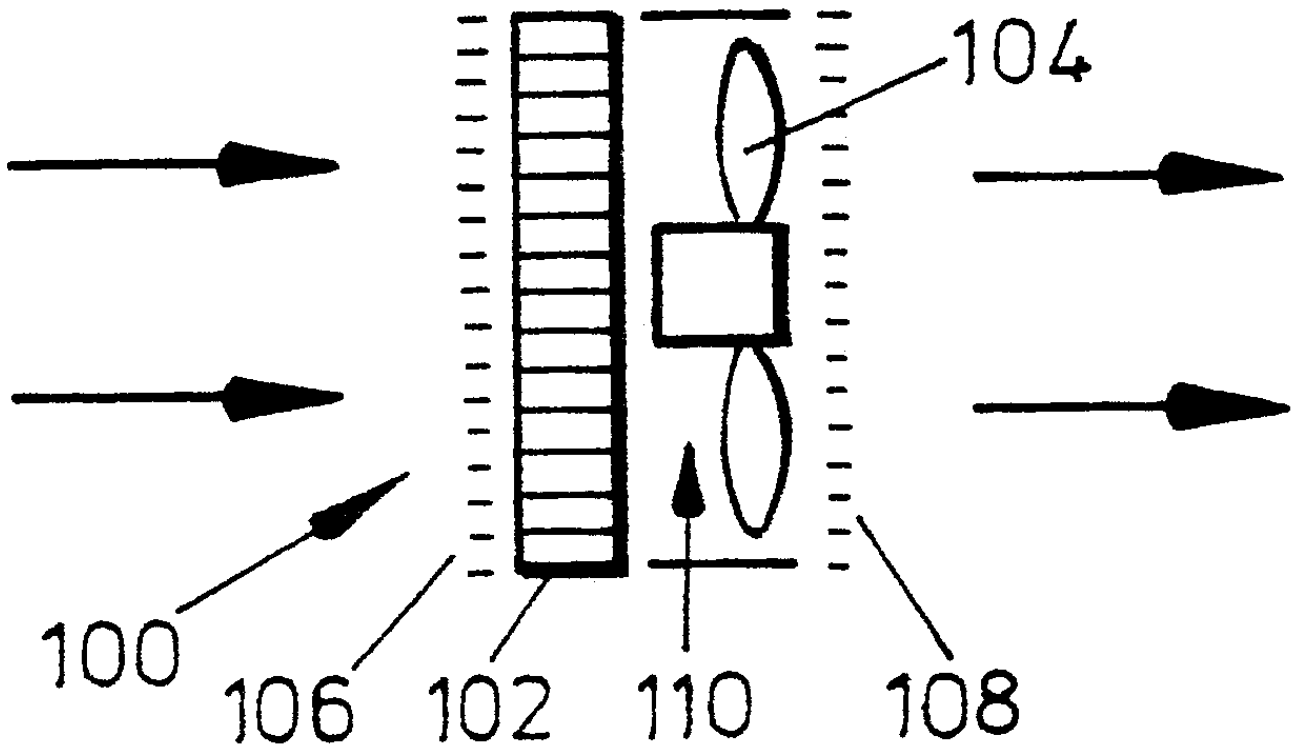
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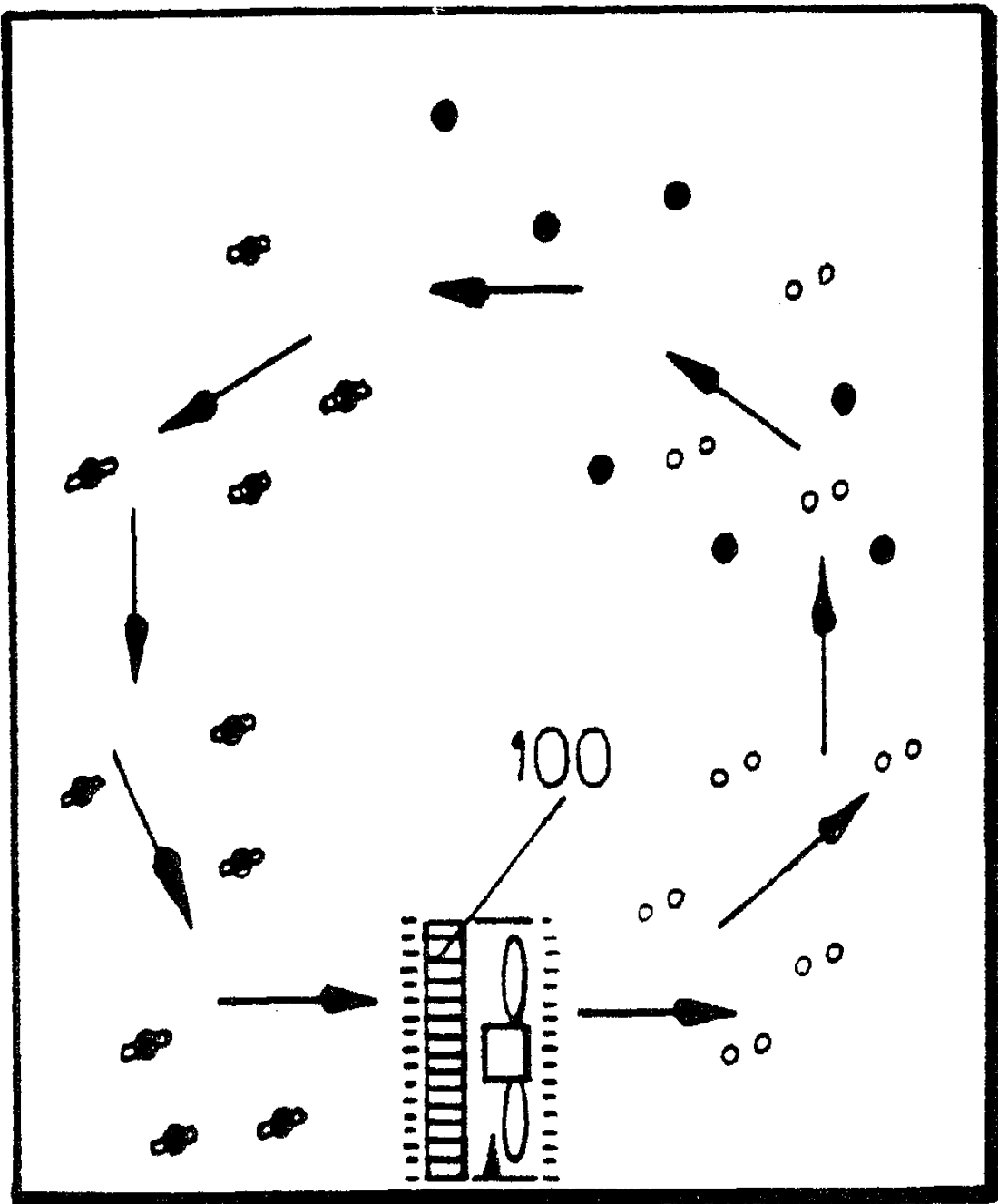


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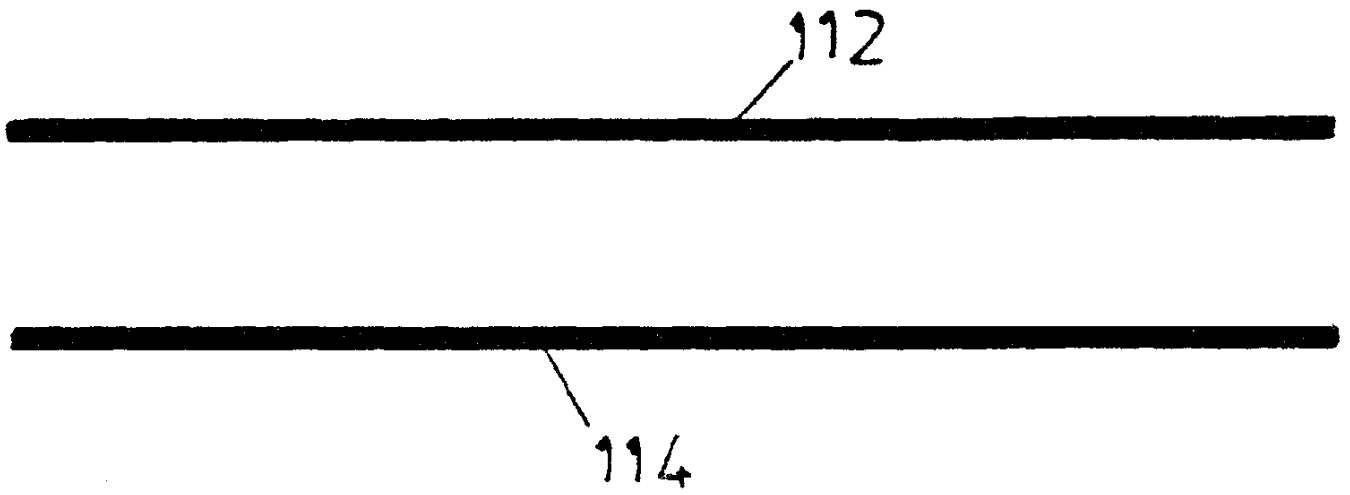
16



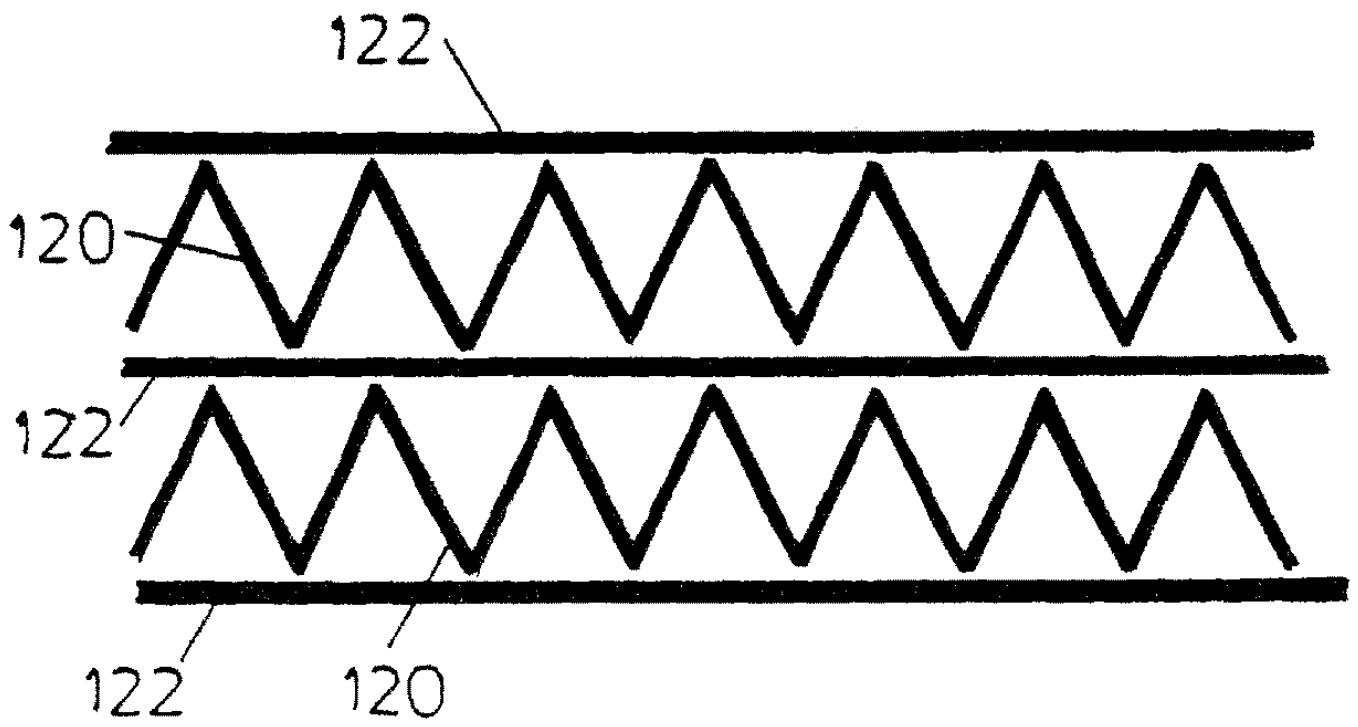


- ^o - 자유 이온
- - 입자
- ⊗ - 하전된 입자

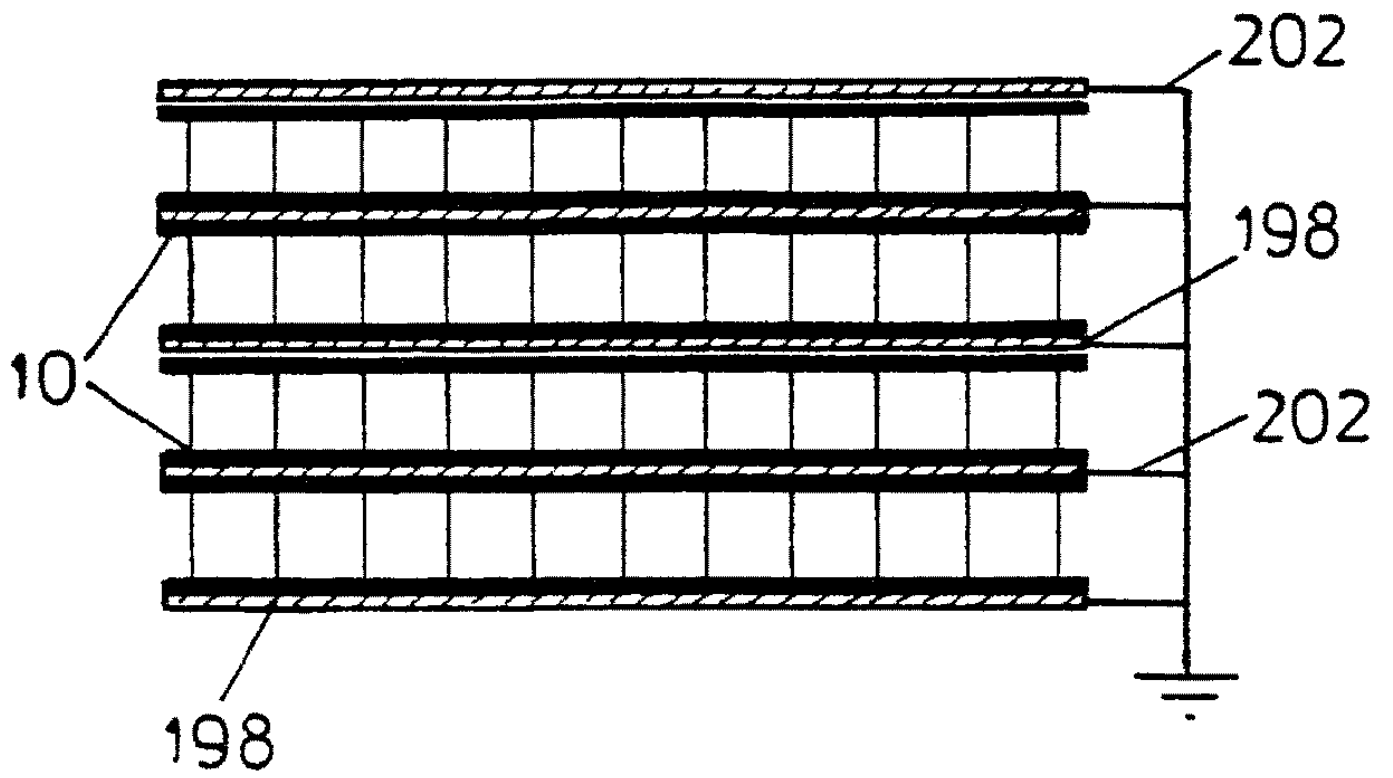
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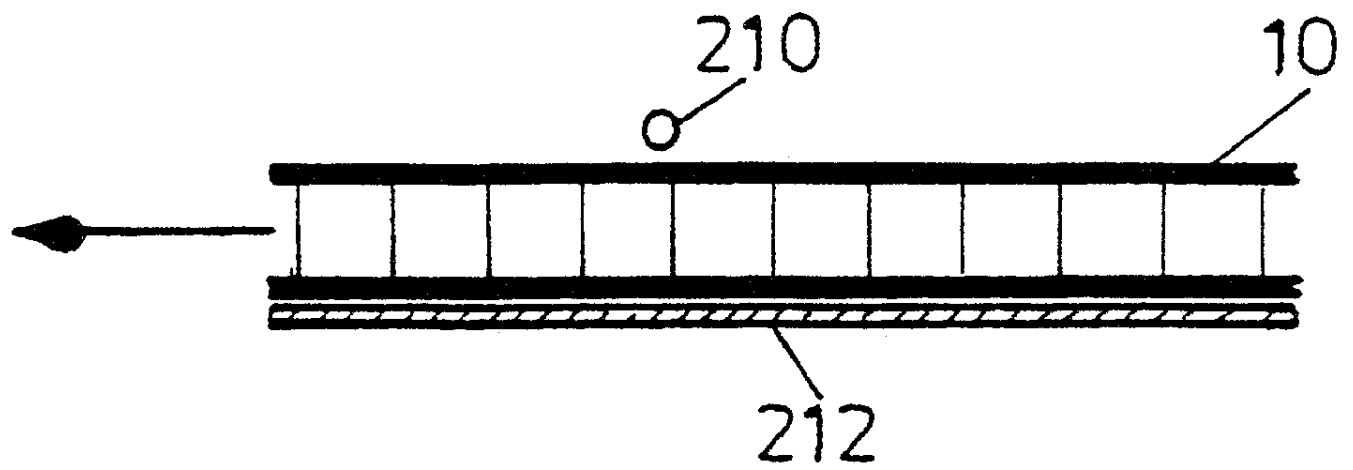
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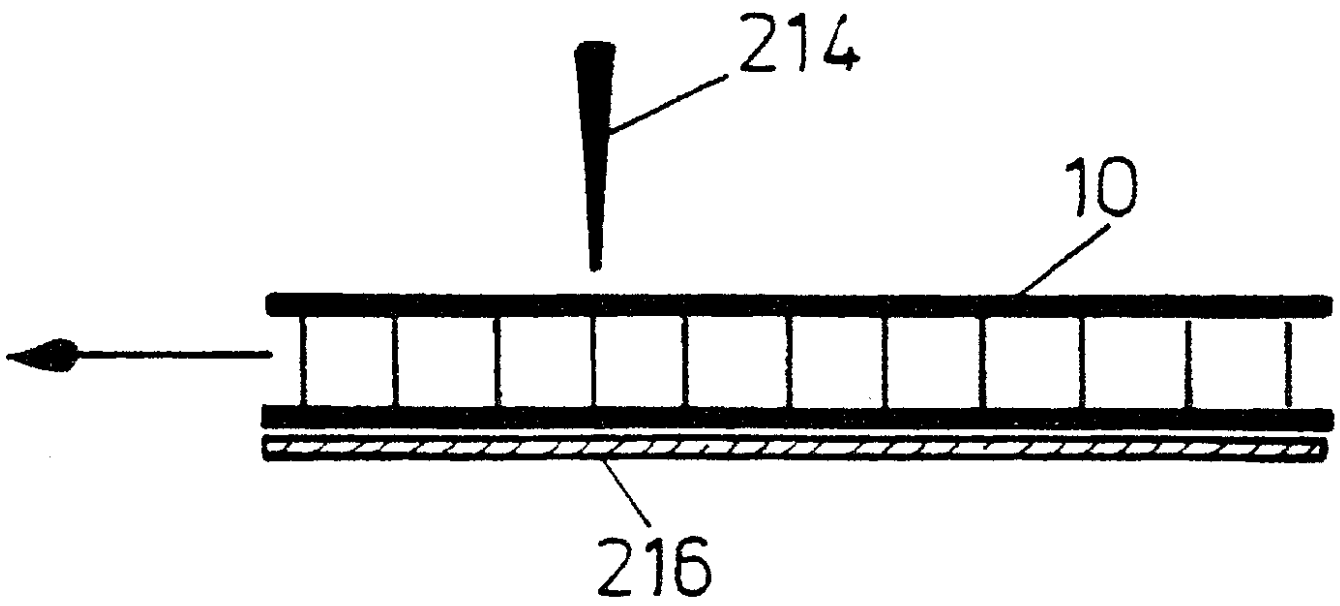
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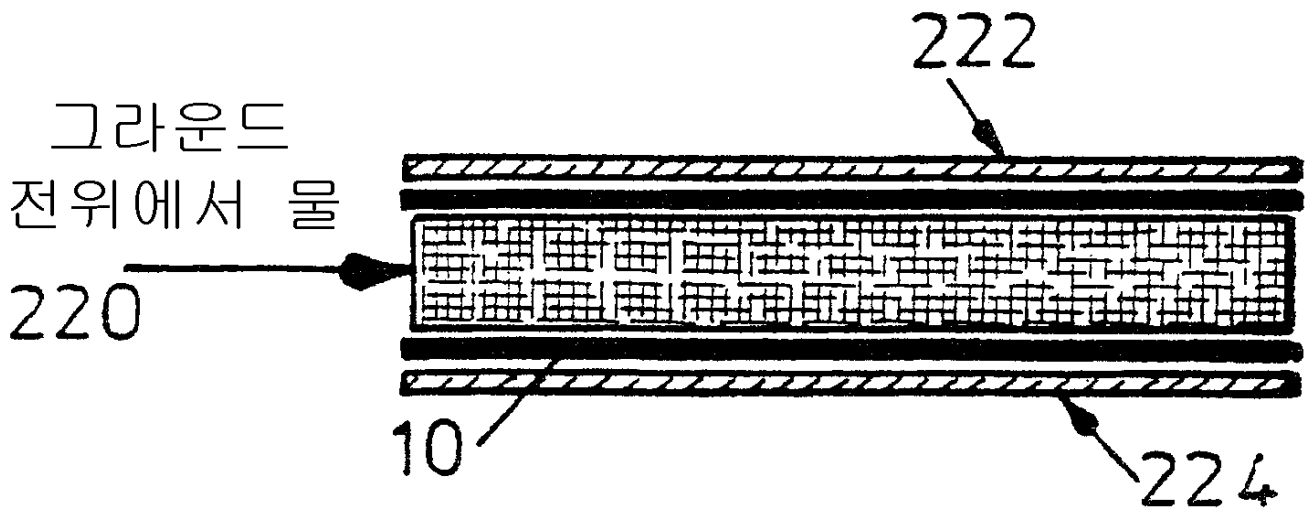
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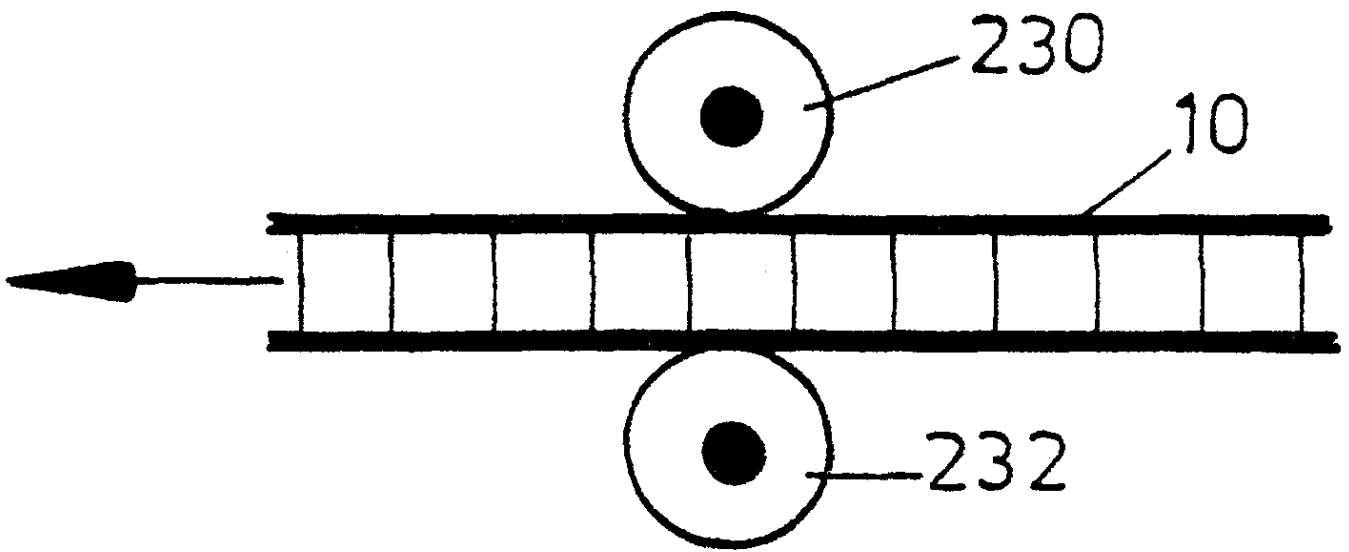
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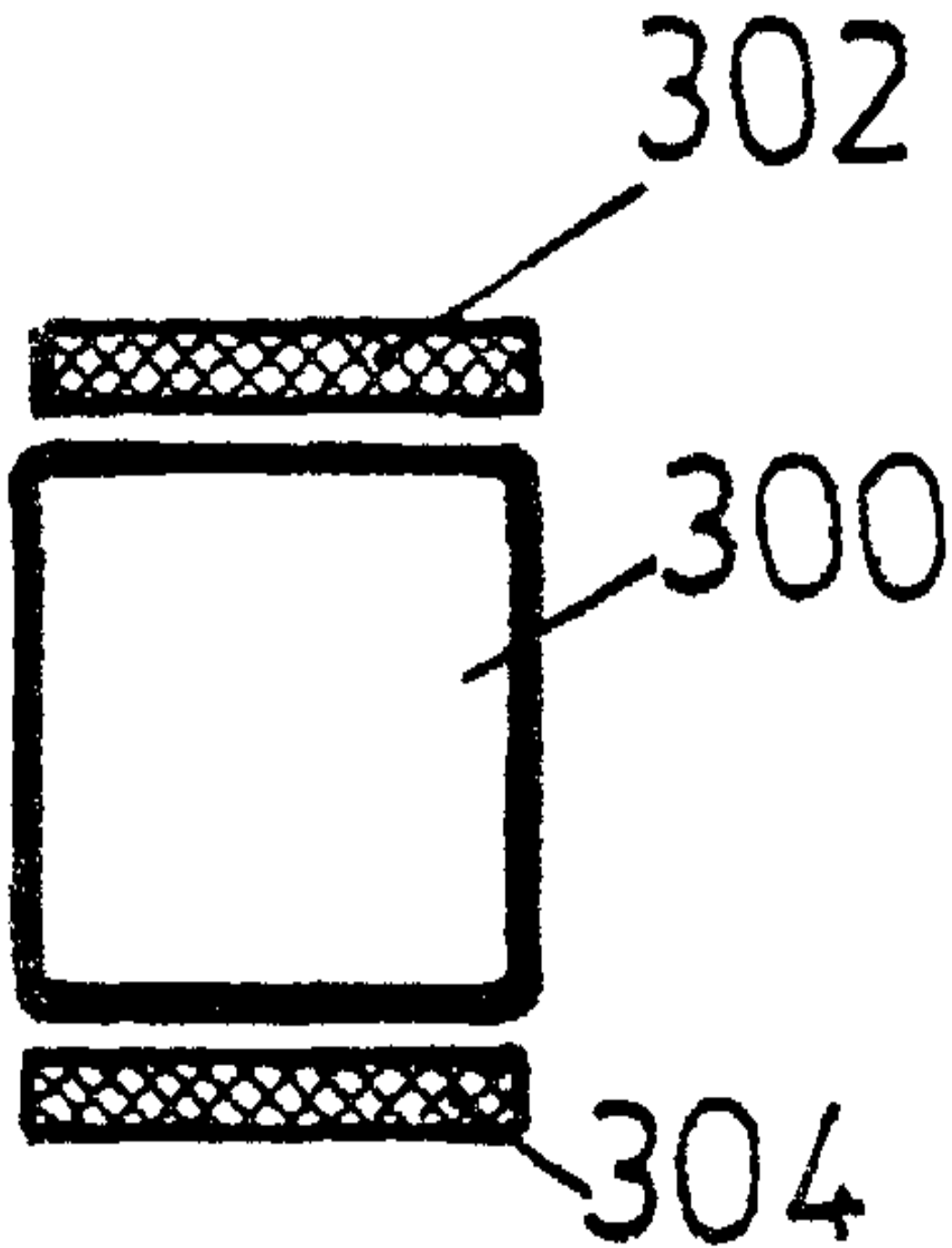


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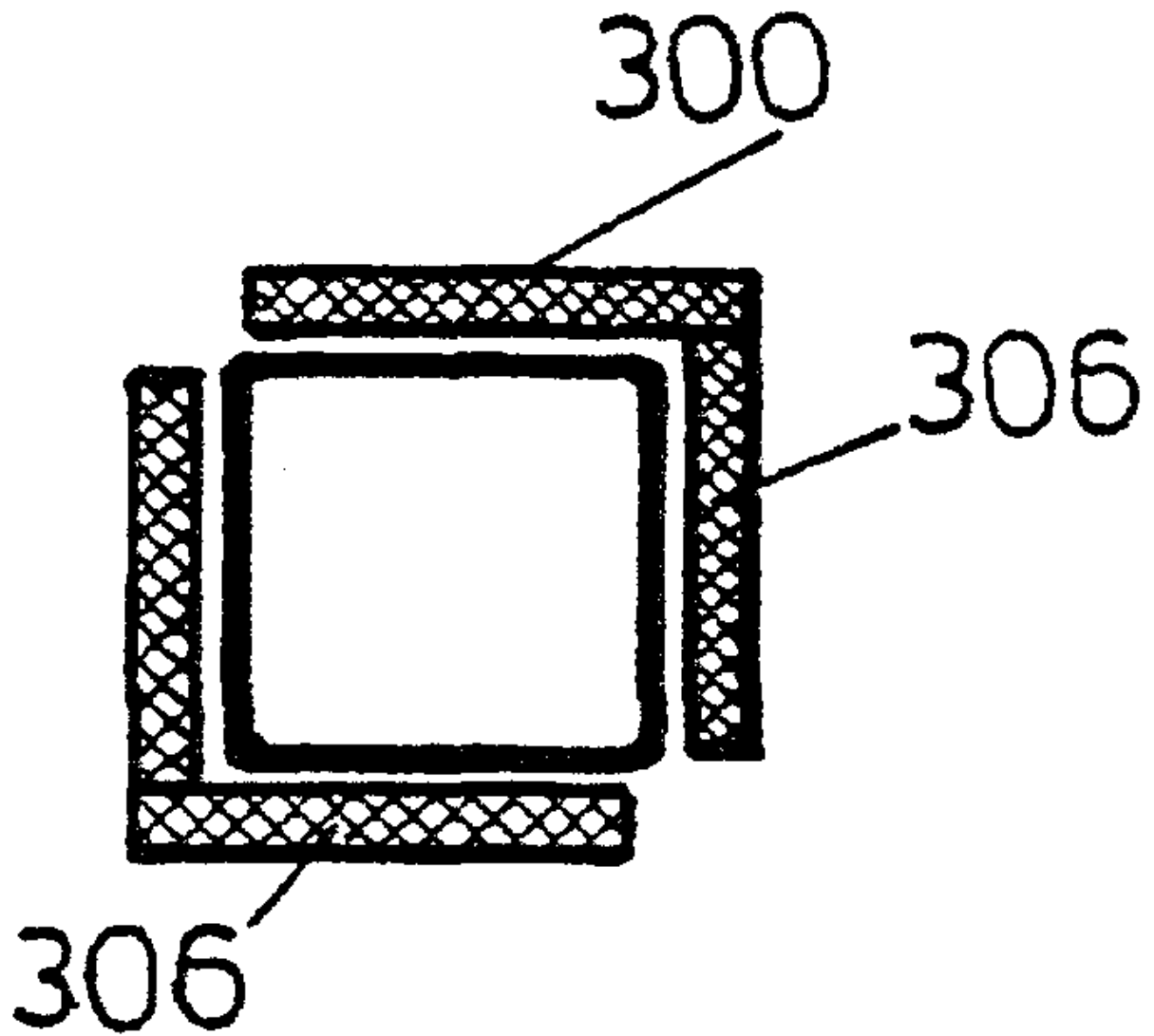


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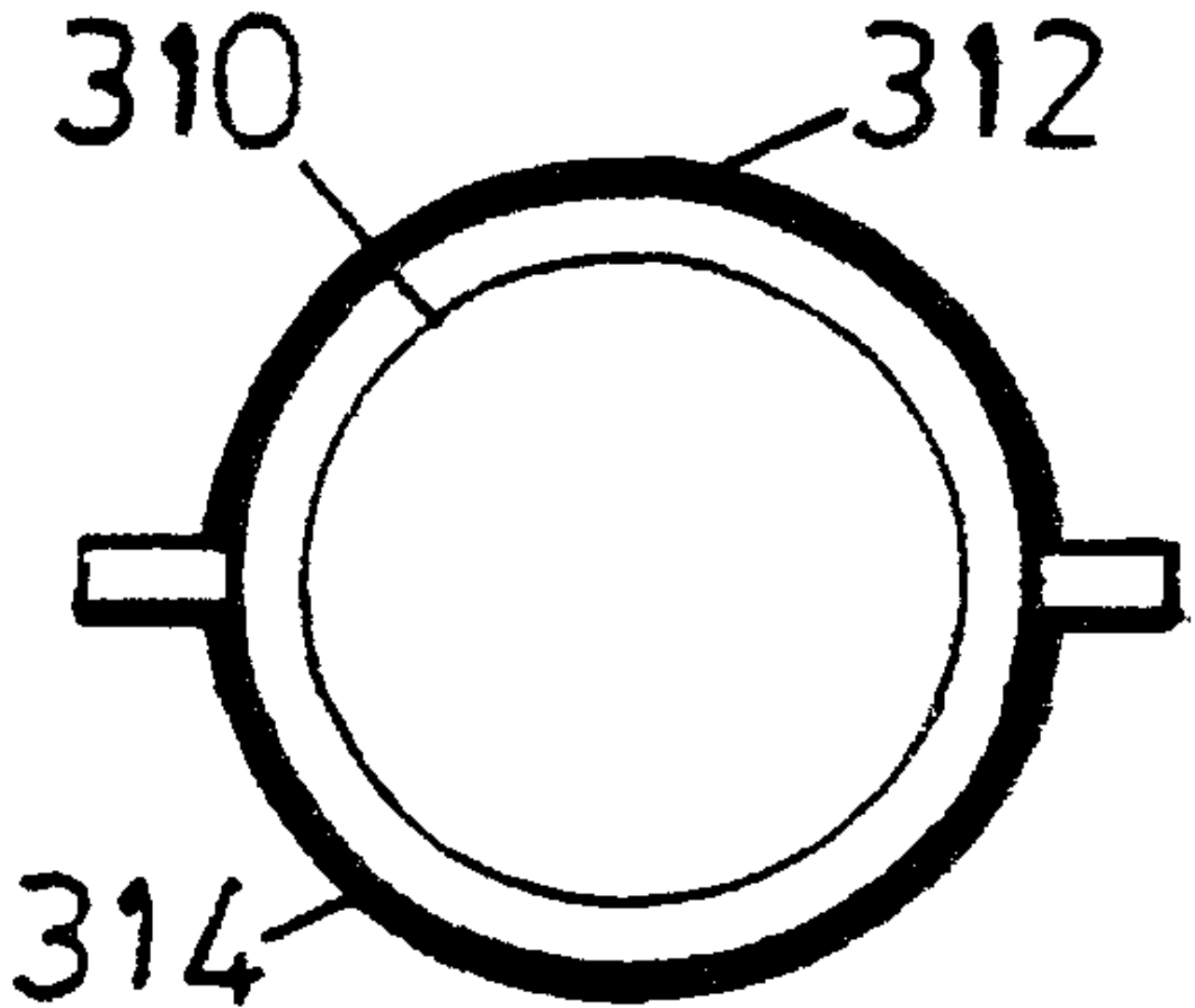




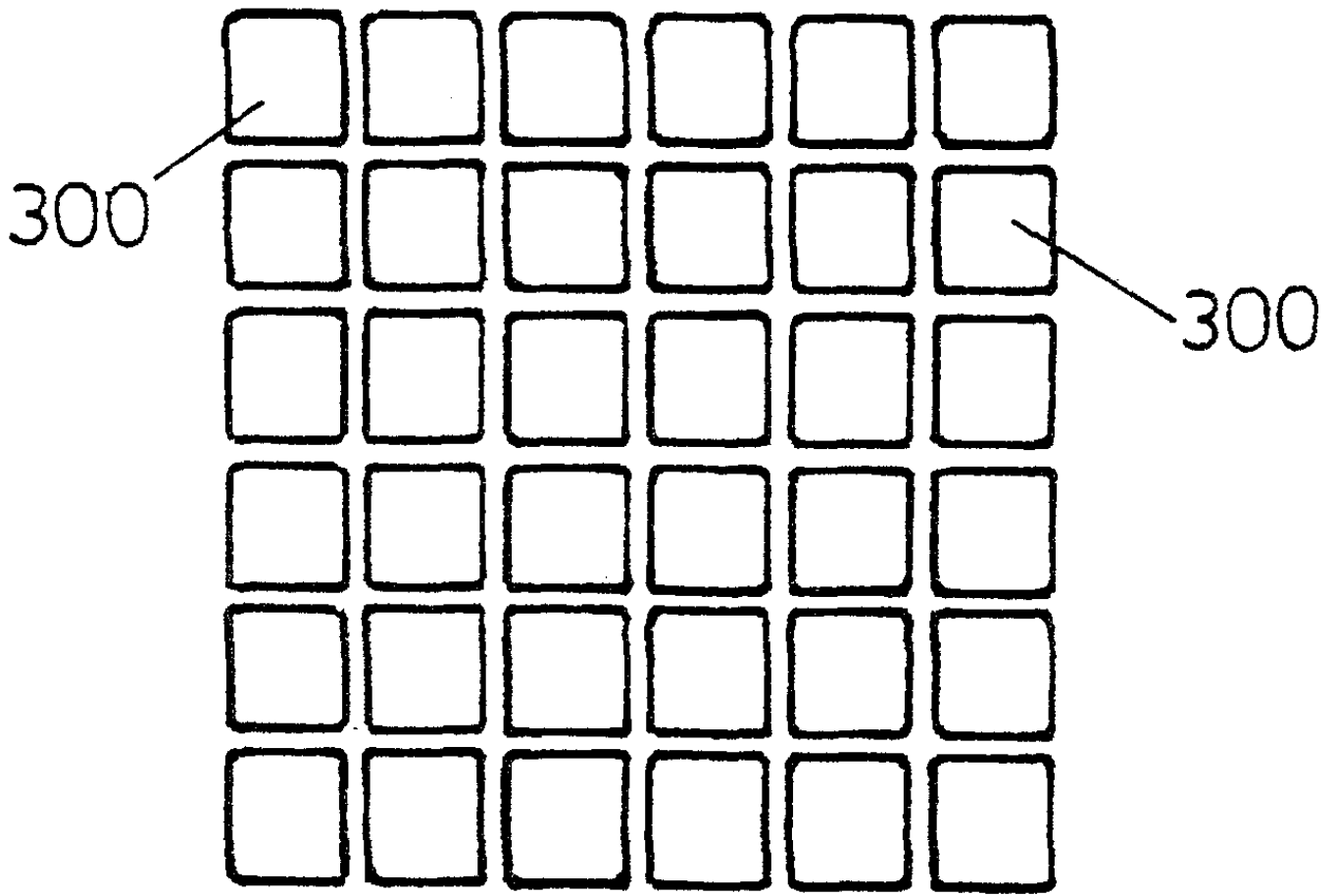
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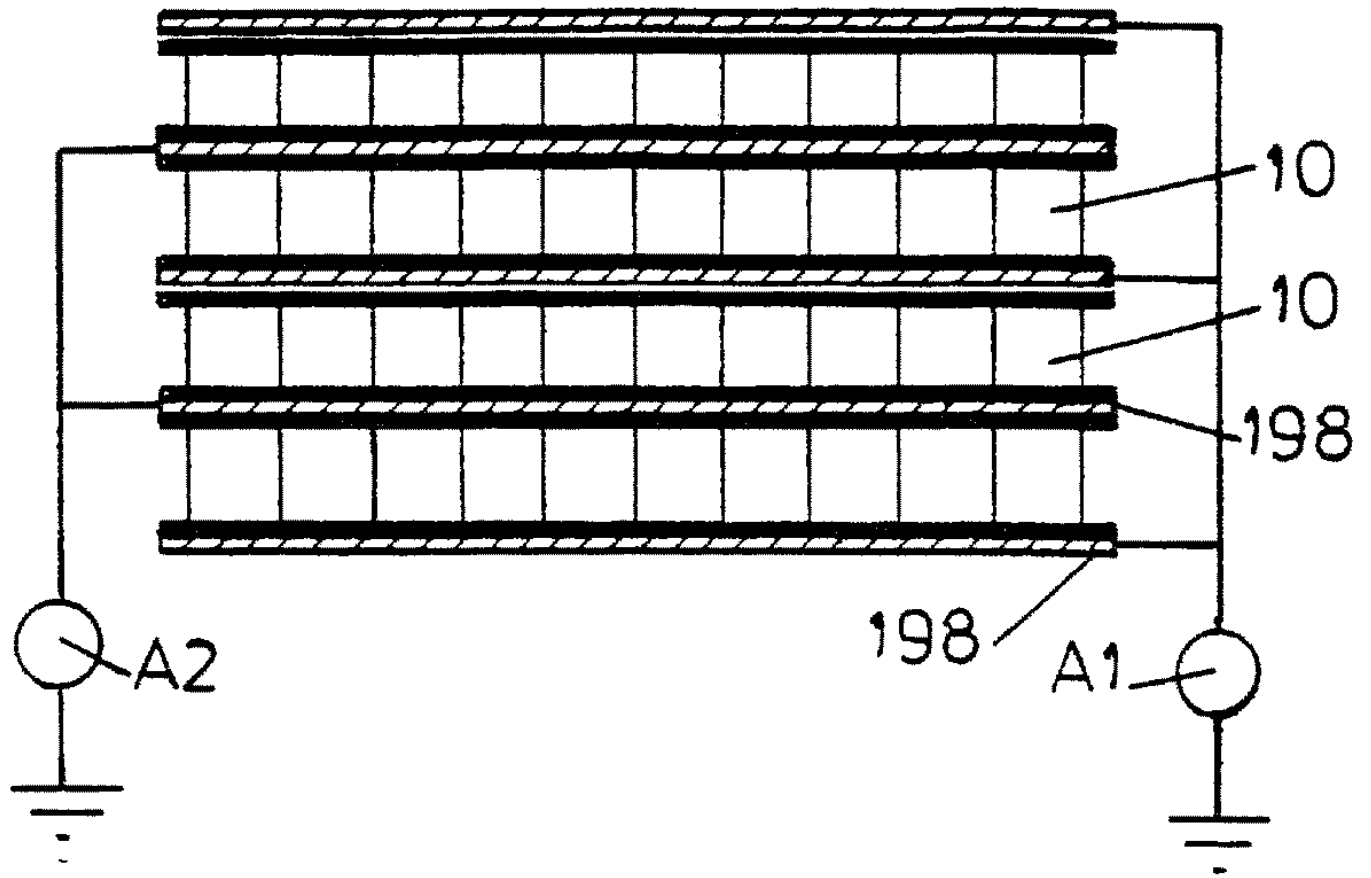


27



28





30

