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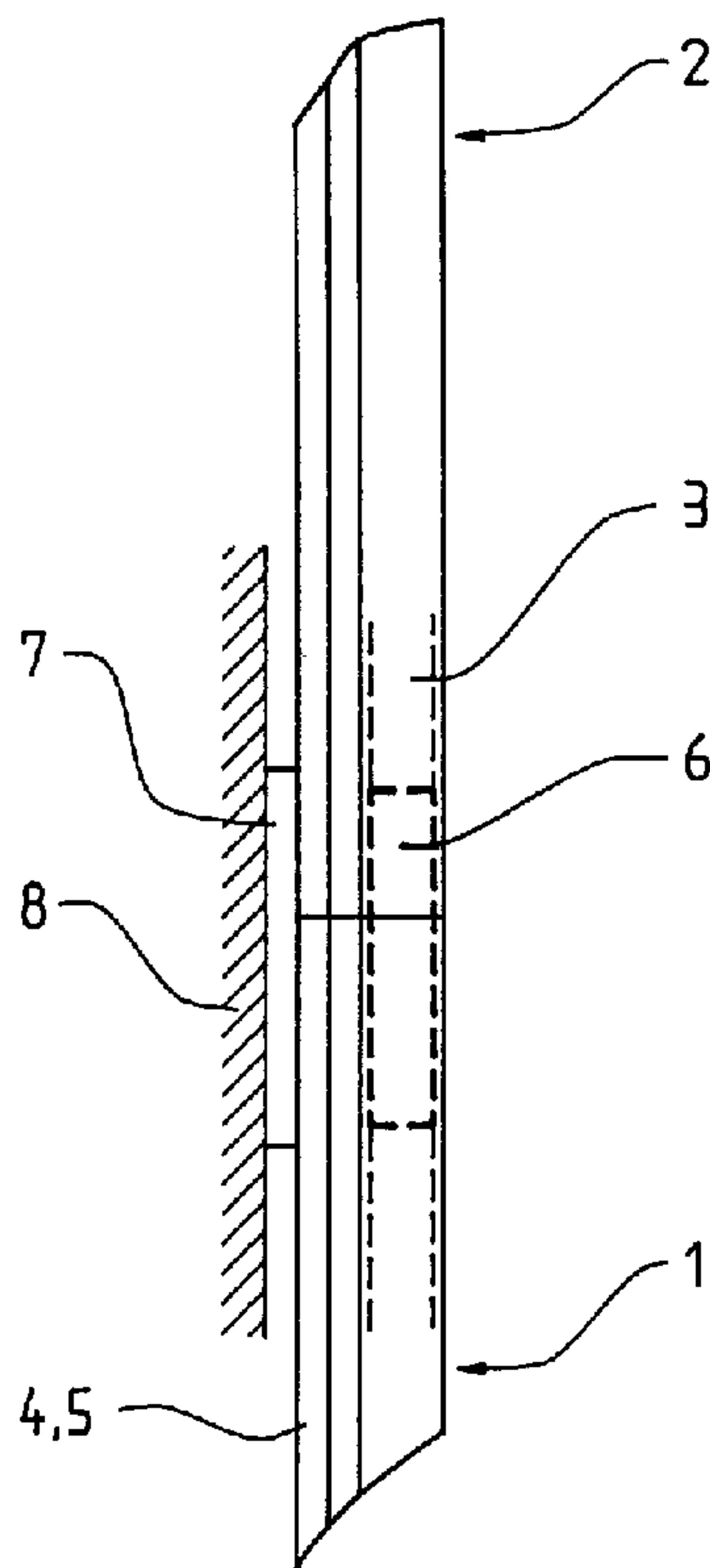
(71) INVENTIO AG, CH

(51) Int.Cl.⁶ B66B 7/02

(30) 1998/01/26 (09/013,016) US

(54) **ELEMENT DE RACCORDEMENT POUR RAIL-GUIDE
D'ASCENSEUR**

(54) **CONNECTING ELEMENT FOR ELEVATOR GUIDE RAIL**



(57) A guide rail system for guiding an elevator car or a counterweight in an elevator shaft includes a pair of .OMEGA.-shaped guide rails (1, 2) having adjacent ends connected by a connecting element. The guide rails (1, 2) have a hollow cylinder-shaped rail body (3) with a pair of flat ends (4, 5). The connecting element includes a tube-shaped connecting member (6) inserted into the rail bodies and a base plate (7, 7a, 7b, 7c) placed under the free ends (4, 5) and attached thereto by fasteners (12). A wedge body (10, 10a, 10b) on the base plate (7, 7a, 7b, 7c) extends into an opening (11, 15) formed in the connecting member (6) to expand the connecting member into locking engagement with the guide rails (1, 2).

ABSTRACT OF THE DISCLOSURE

A guide rail system for guiding an elevator car or a counterweight in an elevator shaft includes a pair of Ω -shaped guide rails (1, 2) having adjacent ends connected by a connecting element. The guide rails (1, 2) have a hollow cylinder-shaped rail body (3) with a pair of flat ends (4, 5). The connecting element includes a tube-shaped connecting member (6) inserted into the rail bodies and a base plate (7, 7a, 7b, 7c) placed under the free ends (4, 5) and attached thereto by fasteners (12). A wedge body (10, 10a, 10b) on the base plate (7, 7a, 7b, 7c) extends into an opening (11, 15) formed in the connecting member (6) to expand the connecting member into locking engagement with the guide rails (1, 2).

TITLE

CONNECTING ELEMENT FOR ELEVATOR GUIDE RAIL

BACKGROUND OF THE INVENTION

5 The present invention relates to a connecting element for an elevator car or a counterweight guide rail with a tube shaped rail body and free ends for the attachment to a beam wherein two guide rails in the rail assembly are connected by a tube shaped connecting member and a cooperating base plate.

10 A common form of elevator guide rail has a T-shaped construction which, when installed in an elevator shaft, has the top or cross portion of the "T" facing the shaft wall and the bottom or body of the "T" facing in a direction whereby wheels or rollers can run on the exposed surfaces of the body. The T-shaped guide rail has several disadvantages that include a concentration of a majority of the material at the center of the "T" resulting in a low stiffness to weight ratio, relatively heavy rail sections that are difficult to move and install, a relatively short spacing between rail
15 brackets to compensate for the relatively low stiffness, and significant machining of the rail surfaces being required for proper alignment of the sections.

The U.S. Patent No. 4,637,496 shows a connecting element for Ω -shaped guide rails. The guide rail has a hollow cylinder shaped rail body with opposed flat portions or ends. The flat ends and the rail body are one piece and have a cross
20 section in the shape of an Ω symbol. A tube shaped connecting member is inserted into the rail body, with approximately one half of the length of the member extending from the rail body. On the edge of each of the flat ends, a holding member is attached. The holding members of the opposed flat ends are connected by means of a threaded bolt. By tightening threaded bolt nuts, the flat ends are moved toward
25 each other. Thereby the cross section of the hollow cylinder shaped rail body is narrowed, which in turn clamps tight the connecting member. A further guide rail is slipped onto the free half of the connecting member and clamped tight by means of holding members and locking bolts on the connecting member.

SUMMARY OF THE INVENTION

30 The present invention concerns a guide rail assembly utilized to guide an elevator car or a counterweight in an elevator shaft. A pair of guide rails each has a

hollow cylinder-shaped rail body. A tube shaped connecting member is inserted into adjacent ends of the guide rails has at least one opening formed therein. A base plate has at least one wedge body extending therefrom and is placed under the free ends of the guide rails such that the wedge body extends into the opening expanding the
 5 connecting member into locking engagement with the guide rails.

The present invention solves the problem of avoiding the disadvantages of the known construction and by creating a connecting element by means of which Ω -shaped guide rails can be mounted like conventional guide rails.

The advantages realized by the invention can be seen essentially in the fact,
 10 that the rail body forming the contact surface for the guide shoes or guiding pulleys, especially in the region of the rail joint is not deformed. The force for the production of the guide rail connection starts from the connecting member and acts uniformly onto the rail body. Thereby also local deformations on the rail body are avoided. The guide shoes and the guiding pulleys glide and roll respectively without jerk and
 15 without noise across the connecting points of the guide rails.

BRIEF DESCRIPTION OF THE DRAWINGS

The above, as well as other advantages of the present invention, will become readily apparent to those skilled in the art from the following detailed description of a preferred embodiment when considered in the light of the accompanying drawings in
 20 which:

Fig. 1 is an elevation view of a connecting element in accordance with the present invention at a connecting point of two Ω -shaped guide rails;

Figs. 2a through 2c show a base plate with a wedge body, a connecting member and an assembly of those two parts for the connecting element shown in the
 25 Fig. 1;

Figs. 3a through 3c are similar to the Figs. 2a through 2c respectively and show a first alternate embodiment of the connecting element with lateral bosses on the base plate;

Figs. 4a through 4c are similar to the Figs. 2a through 2c respectively and show
 30 a second alternate embodiment of the connecting element with multiple wedge bodies on the base plate; and

Figs. 5a through 5c are similar to the Figs. 2a through 2c respectively and show a third alternate embodiment of the connecting element with adjustable wedge bodies on the base plate.

DESCRIPTION OF THE PREFERRED EMBODIMENT

5 In the Figs. 1 through 5c there is shown a first Ω -shaped guide rail 1 for the guidance of an elevator car or of a counterweight, which rail is connected with a second Ω -shaped guide rail 2. The guide rails 1 and 2 have a hollow cylinder-shaped rail body 3, along which not illustrated guide shoes and guiding pulleys are gliding and rolling respectively and guide a not illustrated elevator car or a not illustrated
 10 counterweight. The guide rails 1 and 2 each have a pair of opposed, outwardly and longitudinally extending flat ends 4 and 5. The flat ends 4 and 5 and the rail body 3 are a single piece formed in the shape of the symbol Ω . Other shapes, for example egg shapes or teardrop shapes, are also possible. Slid into the rail body 3 is a tube shaped connecting member 6, which member is inserted approximately one half of
 15 its length into the rail body of each of the guide rails 1 and 2. A base plate 7 is placed under the flat ends 4 and 5 and is in operative connection with the connecting member 6 for establishment of the guide rail connection. The base plate 7 may or may not be attached to a beam 8, for example to a wall or to a steel girder. During the assembly, the first guide rail 1 is installed in an elevator shaft, subsequently the
 20 connection member 6 is slid into the end of the first guide rail, the second guide rail 2 is installed on the connection member to abut the end of the first guide rail, and finally the base plate 7 is placed under the guide rails and the guide rail connection is established as illustrated and explained below.

The Figs. 2a through 2c show the base plate 7 consisting of a wedge shaped
 25 wedge body 10 connected to an extending outwardly from a generally planar base body 9. The wedge body 10 is dimensioned in such a way that it fits into an opening, for instance into an axially running slot 11, formed in the connecting member 6. The slot 11 is oriented adjacent the flat ends 4 and 5 when the connecting member 6 is inserted into the first guide rail 1. For establishment of the guide rail connection, the
 30 base plate 7 is attached to the free ends 4 and 5 by fastening elements 12, for example screws or bolts penetrating holes 13 formed in the base body 9. In this way,

the wedge body 10 is pressed into the slot 11 of the connecting member 6 and the connecting member is uniformly enlarged or expanded. By the enlargement of the connecting member 6, a solid releasable locking connection between the connecting member and the rail body 3 is created. The guide rail connection is completely established as soon as all of the fastening elements 12 have been tightened.

The Figs. 3a through 3c show an alternate embodiment connecting element having an alternate base plate 7a with upwardly extending stops 14 arranged laterally on edges of base body 9, which stops avoid a yielding of the free ends 4 and 5 due to the enlargement of the connecting member 6 upon tightening of the bolts 13.

The Figs. 4a through 4c show a second alternate embodiment connecting member having second alternate base plate 7b with a plurality of truncated cone shaped wedge bodies 10a extending therefrom. The wedge bodies 10a fit into openings such as bore holes 15 arranged along the slot 11. It is advantageous in this variant, that the truncated cone shaped wedge bodies 10a retain and position the connecting member 6. The wedge bodies 10a shown in the Fig. 4a are arranged solidly on the base body 9, and the establishment of the guide rail connection takes place as shown and described above. The wedge bodies 10a can also be arranged adjustably by means of bolts on the base body 9. The establishment of the guide rail locking connection then takes place as illustrated and described below.

The Figs. 5a through 5c show a third alternate connecting member having a third alternate base plate 7c with elongated wedge bodies 10b adjustable by means of bolts 16 threaded through the base plate. Shown are two of the wedge bodies 10b each engaging two of the bolts 16. It is also possible to have one or more of the wedge bodies 10b with a corresponding number of the bolts 16. For establishment of the guide rail connection, the base plate 7c is placed under the free ends 4 and 5, which are then attached by means of the fastening elements 12. Thereafter, the wedge bodies 10b enlarging or spreading the connecting member 6, are driven into the slot 11 by rotating the bolts 16, until a solid, releasable locking connection between the connecting member and the rail body 3 is produced. Prior to the enlargement of the connecting member 6, a tool 17 extending over the guide rail

joint region is placed onto the rail body 3, which tool maintains the rail body in correct shape during the establishment of the guide rail connection.

In summary the guide rail assembly according to the present invention includes: at least a pair of the guide rails 1 and 2, each having the hollow cylinder-shaped rail body 3 and the free ends 4 and 5; the tube shaped connecting member 6 inserted into adjacent ends of the guide rails, the connecting member having at least the one opening 11 and 15 formed therein; and the base plate 7, 7a, 7b and 7c having at least the one wedge body 10, 10a and 10b extending therefrom, the base plate being placed under the free ends of the guide rails and the wedge body extending into the opening expanding the connecting member into locking engagement with the guide rails.

In accordance with the provisions of the patent statutes, the present invention has been described in what is considered to represent its preferred embodiment. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope.

WHAT IS CLAIMED IS:

1. A connecting element for guide rails (1, 2) utilized to
guide an elevator car or a counterweight the guide rails
5 having a hollow cylinder-shaped rail body (3) and free ends
(4, 5) there being in the rail body (3) for the purpose of
connecting two guide rails (1, 2) a connecting member (6)
characterized in that
under the free ends (4, 5) there is a base plate (7) having
10 at least one wedge body (10) which fits into an opening (11,
15) in the connecting member (6) said wedge body (10)
expanding said connecting member (6).
2. The connecting element according to claim 1
15 wherein there is at least one wedge-shaped wedge body (10)
which fits into a slot (11) in the connecting member (6) and
said wedge-shaped wedge body (10) expands said connecting
member (6) during assembly of the guide rails (1, 2).
- 20 3. The connecting element according to claim 1
wherein there is at least one truncated cone shaped wedge
body (10) which fits into a bore hole (15) in the slot (11)
of the connecting member (6) and said truncated cone shaped
wedge body (10) expands said connecting member (6) during
25 assembly of the guide rails (1, 2).
4. The connecting element according to aforementioned claims
wherein there is at least one adjustable wedge body (10)
which serves to expand the connecting member (6) after
30 assembly of the guide rails (1, 2).
5. The connecting element according to claim 4
wherein for the purpose of adjusting the wedge body (10)
there is at least one bolt (16) in the base plate (7).

6. The connecting element according to one of the
aforementioned claims
wherein the base plate (7) has a stop (14) for each free end
(4, 5) for guiding the free end (4, 5).

Fig. 1

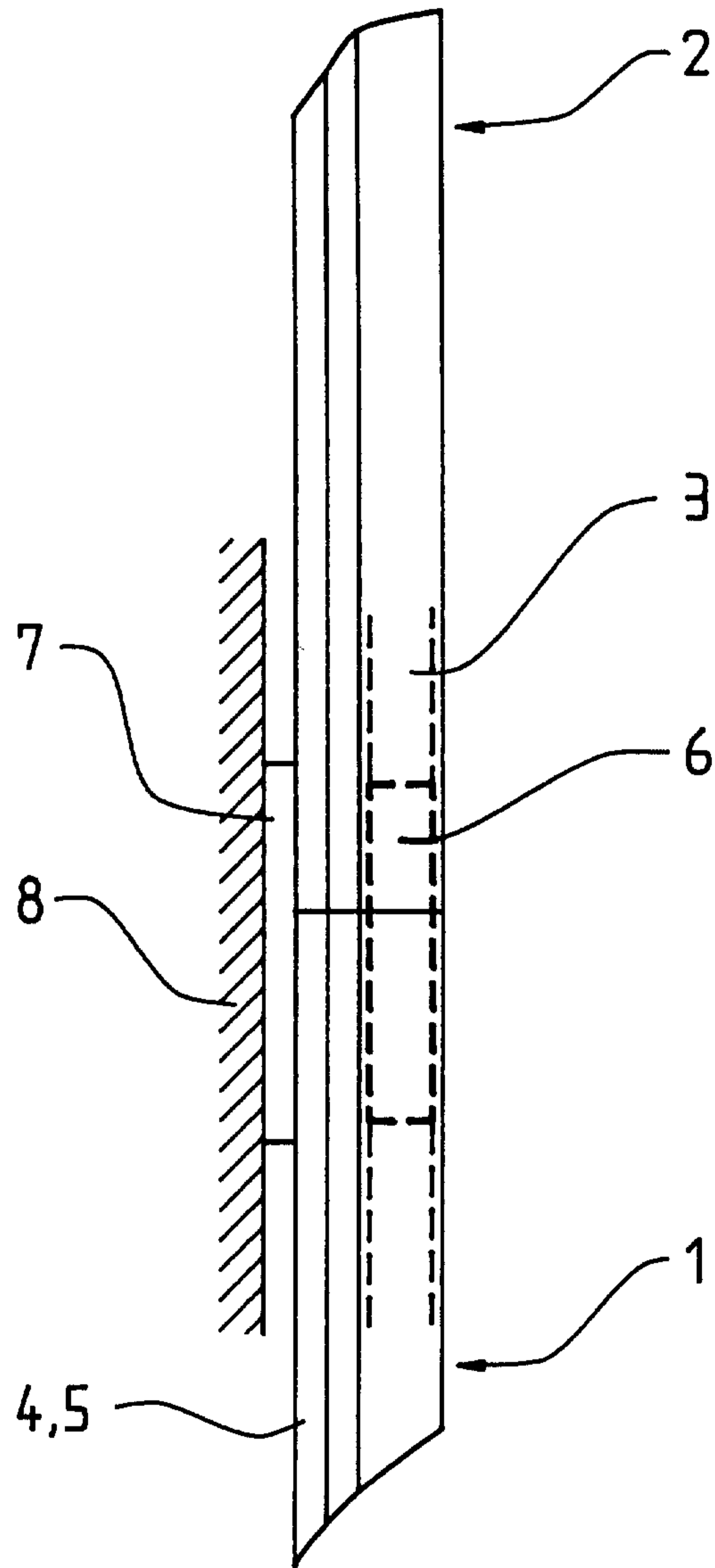


Fig. 2a

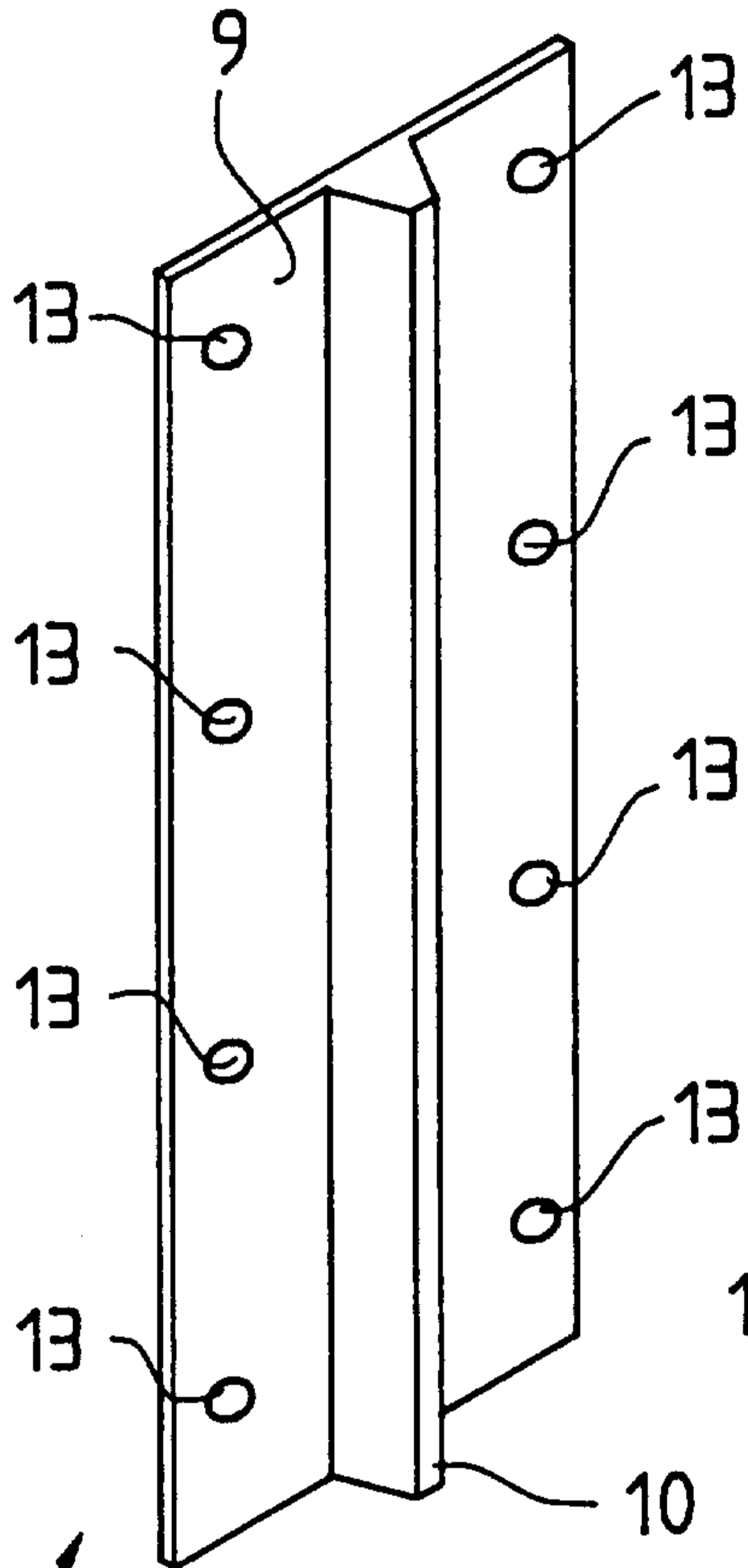


Fig. 2b

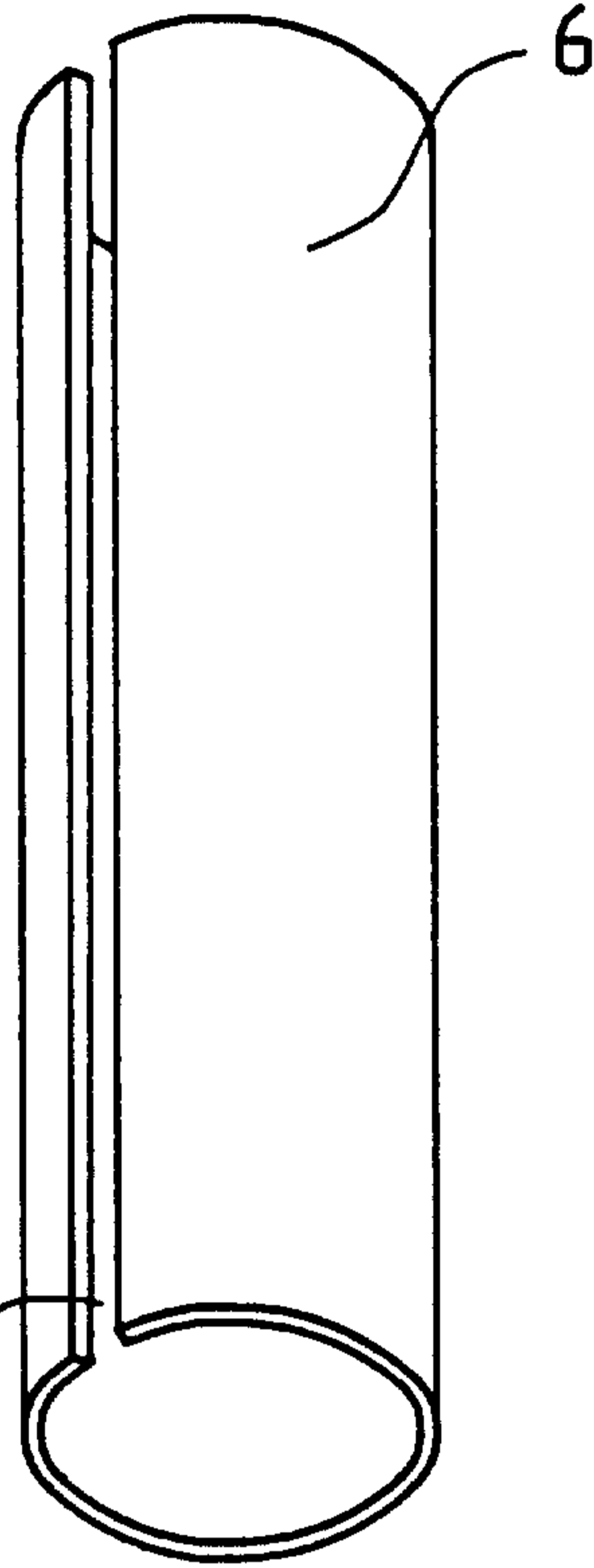


Fig. 2c

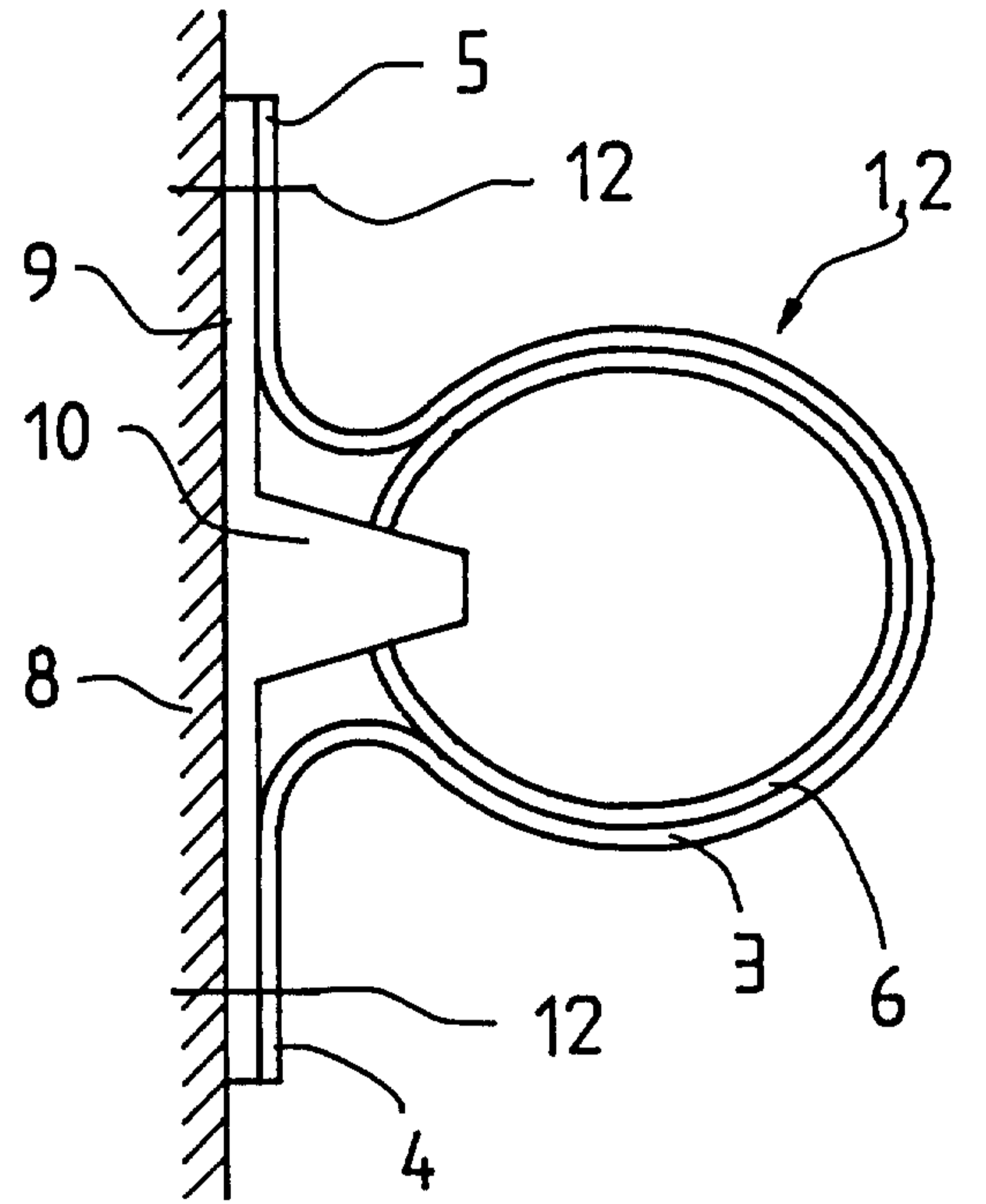


Fig. 3a

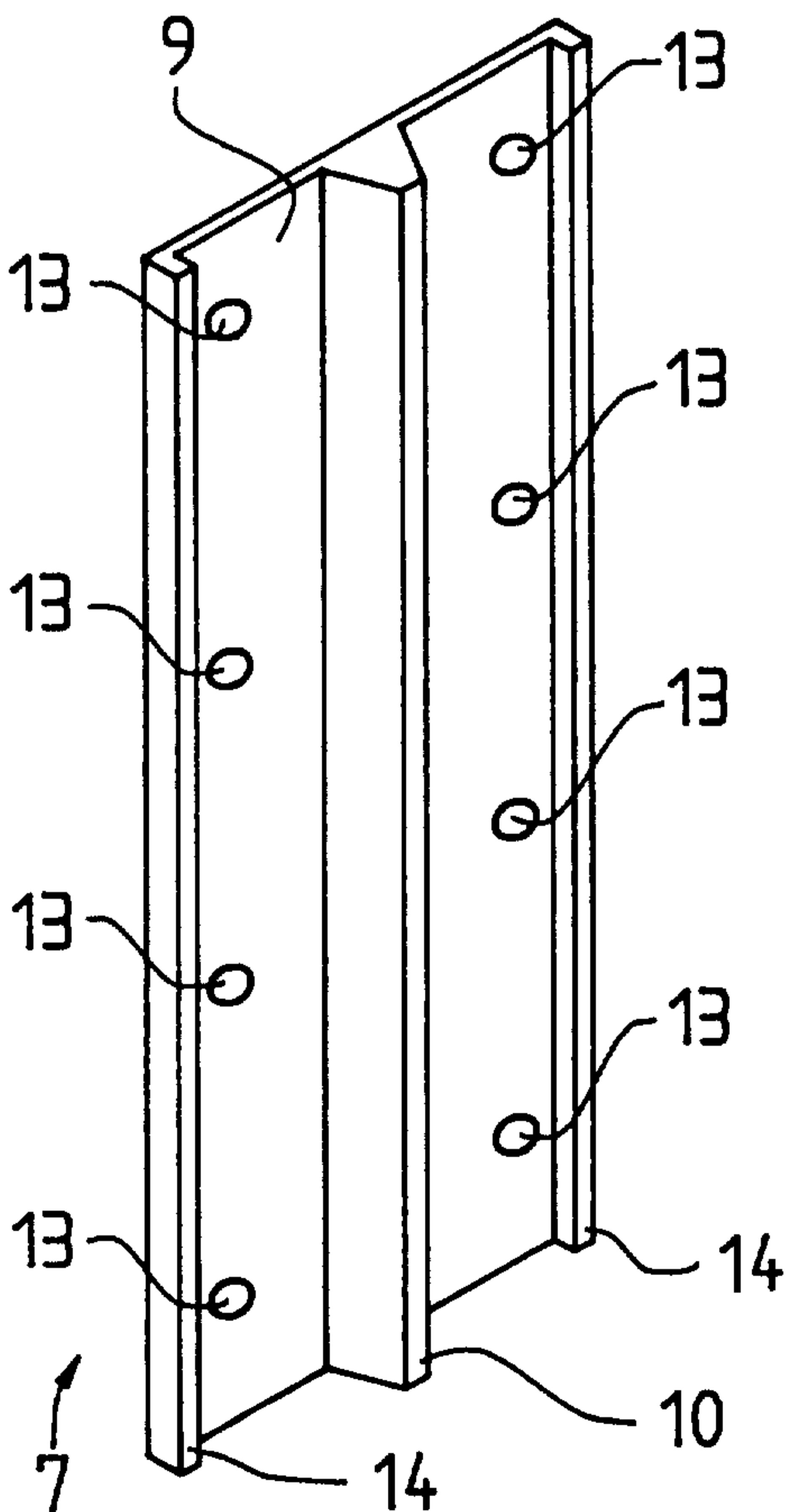


Fig. 3b

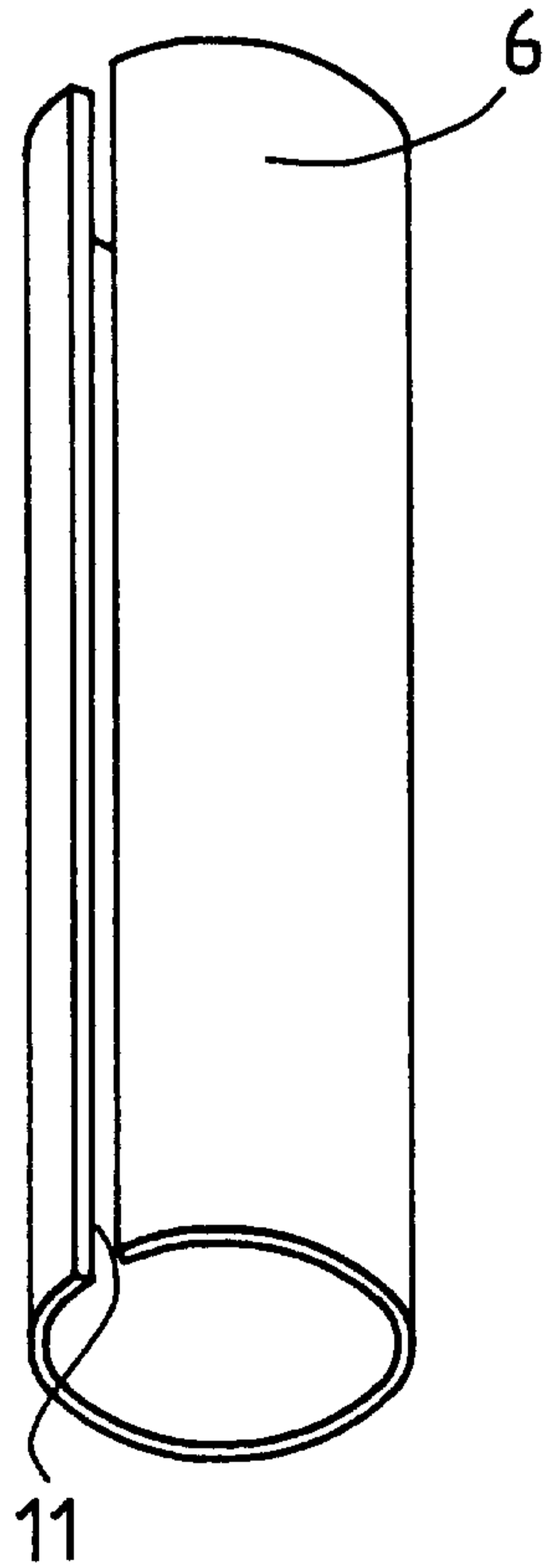


Fig. 3c

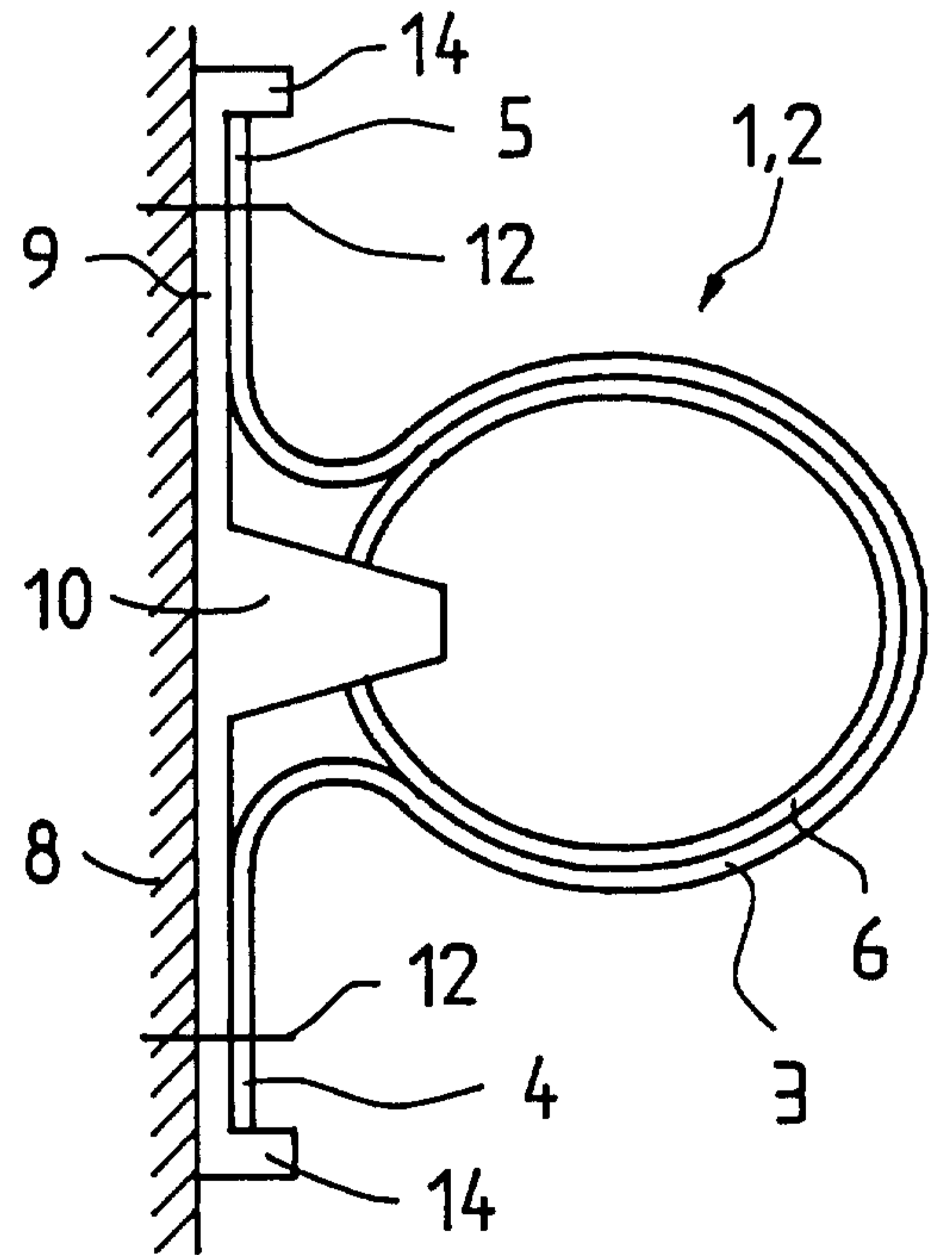


Fig. 4a

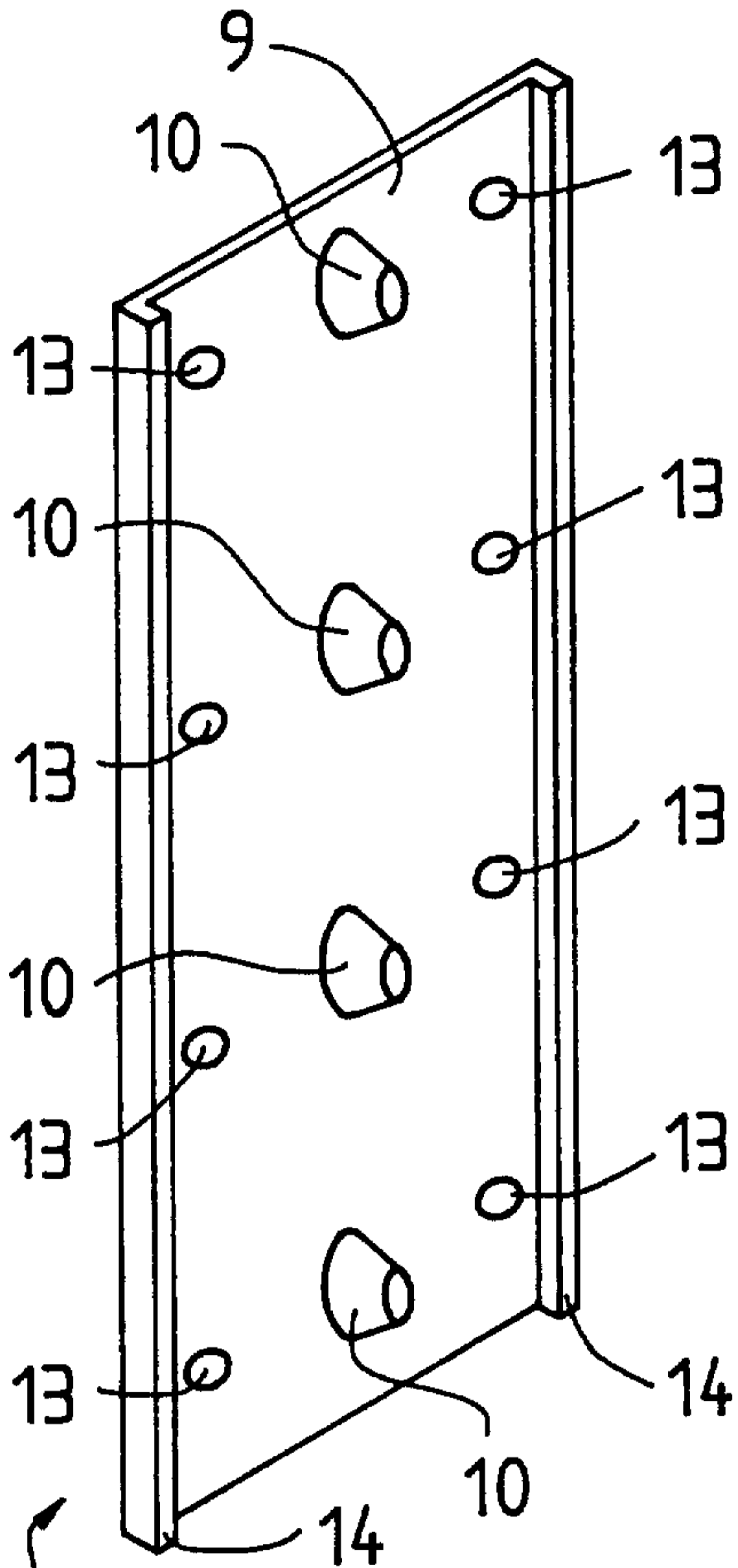


Fig. 4b

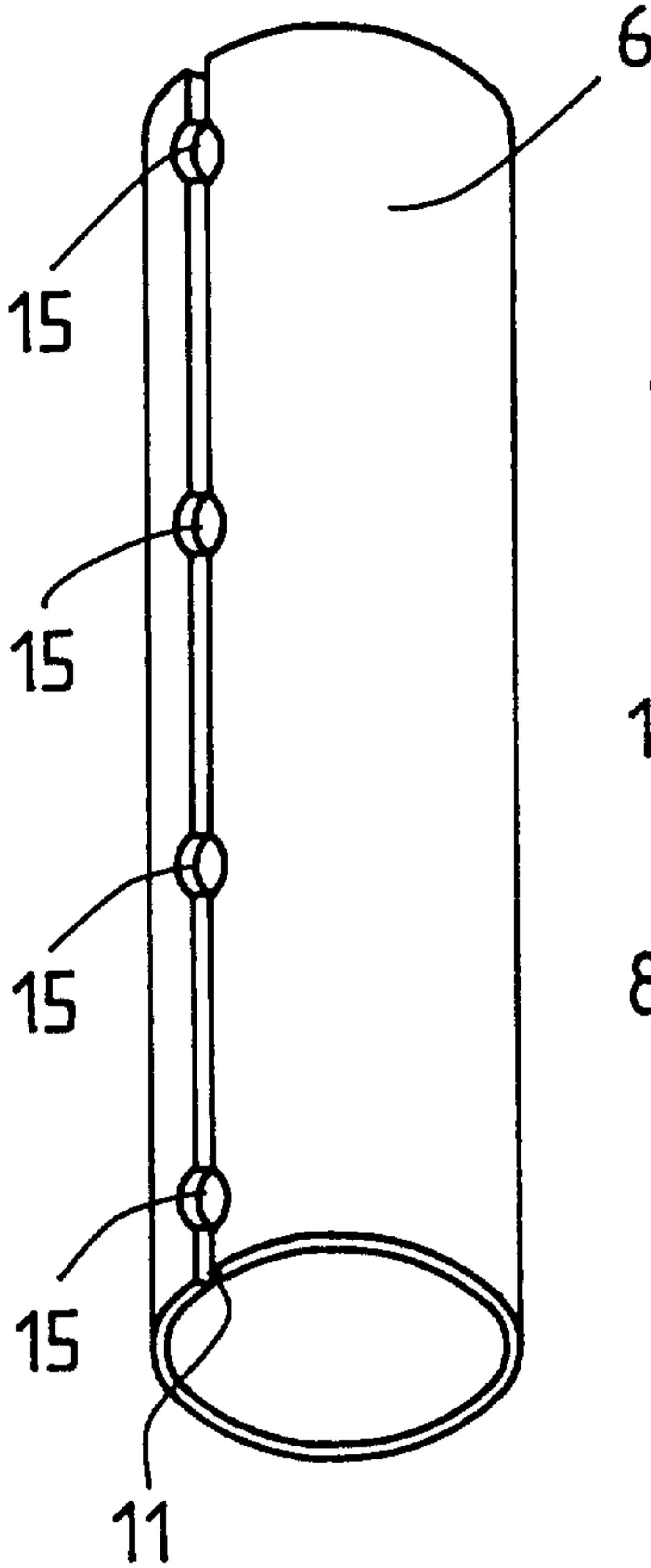


Fig. 4c

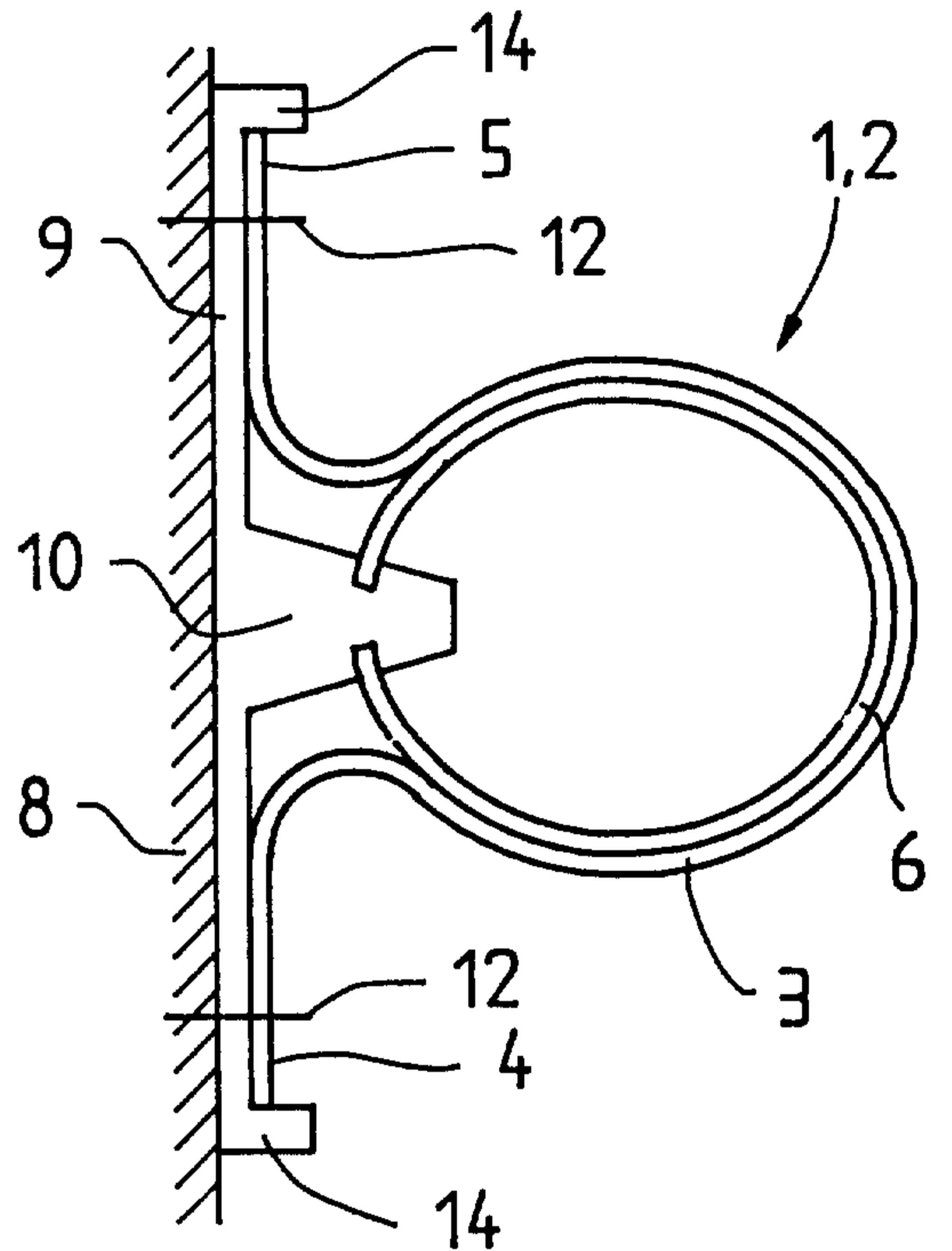


Fig. 5a

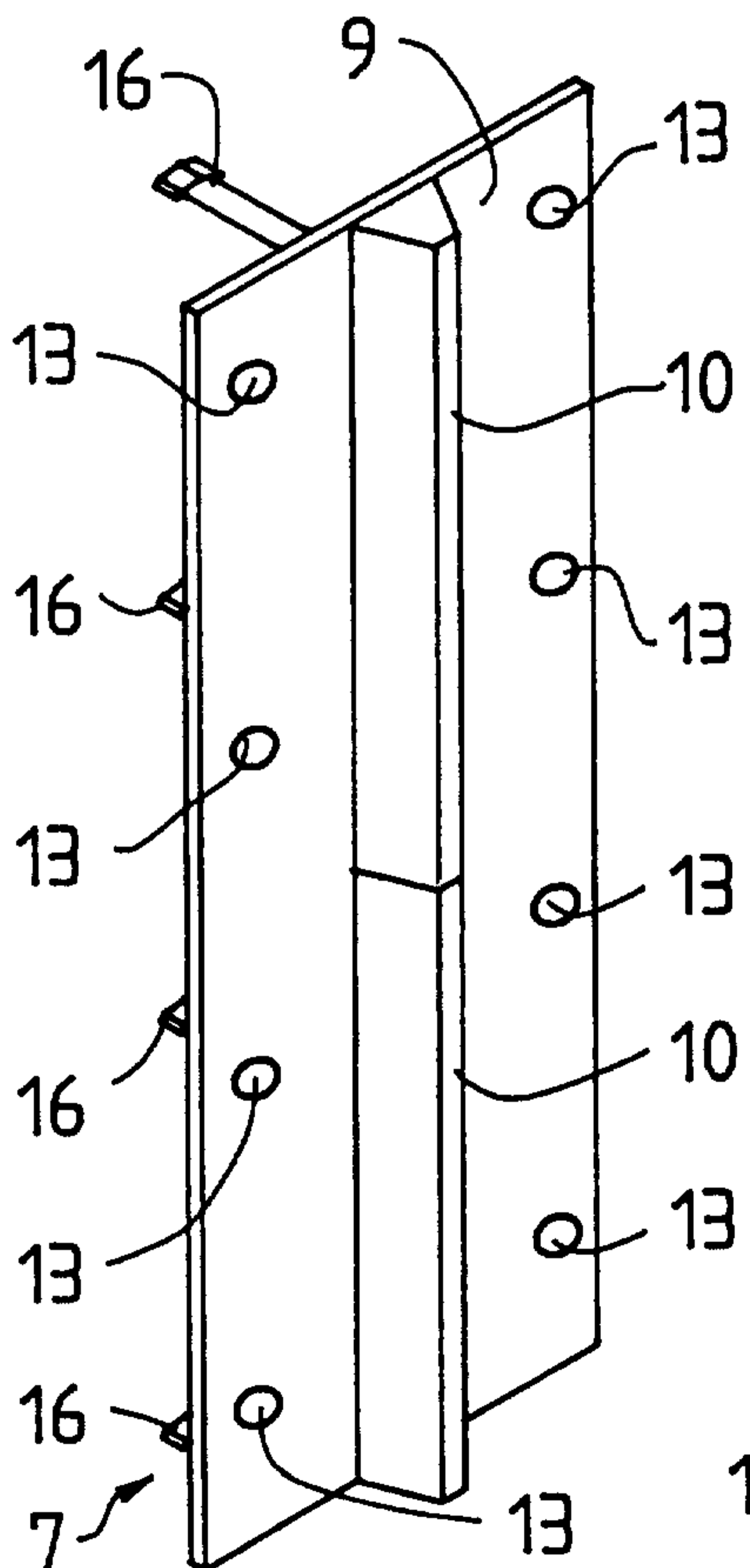


Fig. 5b

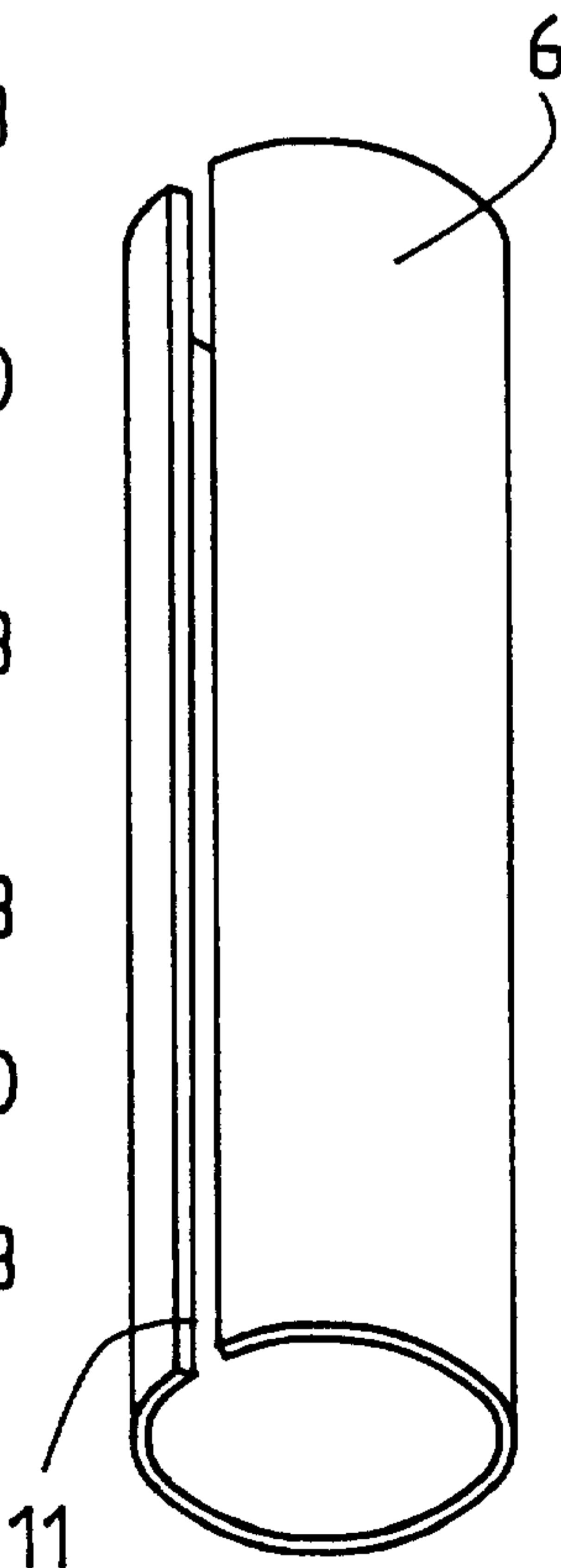


Fig. 5c

