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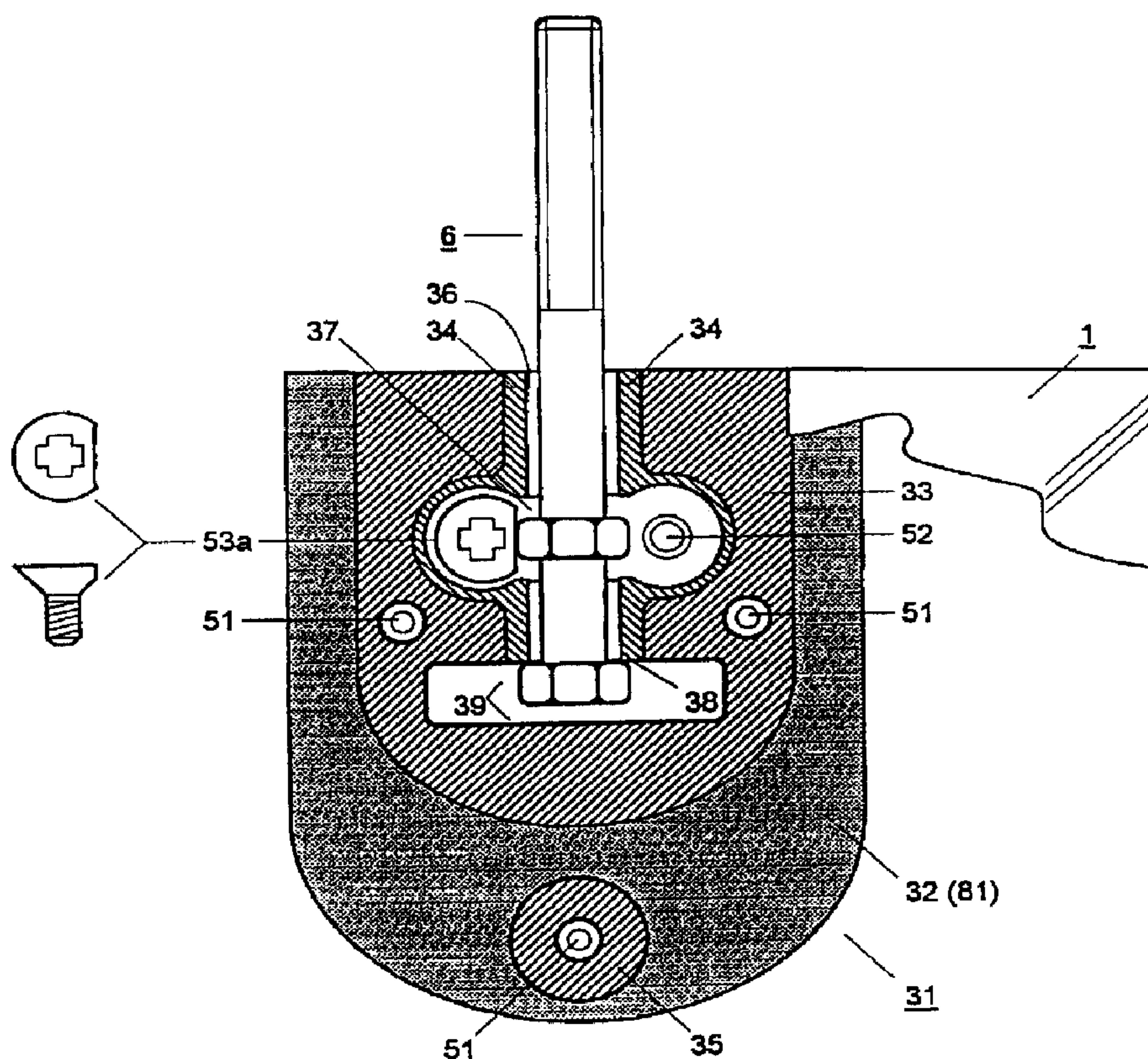
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(54) Titre : DISPOSITIF POUR RELIER UN ELEMENT DEPLACABLE A UN DISPOSITIF DE GUIDAGE

(54) Title: DEVICE FOR CONNECTING A DISPLACEABLE ELEMENT TO A GUIDE DEVICE



(57) Abrégé/Abstract:

The device (2) in accordance with the invention, which serves the joining of a sliding element (1), in particular a glass, metal, or wooden panel, with a guide device (93; 93a) that is guided in a track (91; 91a), exhibits a first and a second mounting piece (31; 41) that contain outer plates (32; 42) which can be joined together via an axle (35), and inserts (33; 43). The inserts (33; 43),

(57) Abrégé(suite)/Abstract(continued):

which are fitted in a cutout (11) on the edge of the element (1) and connected with one another, enclose a connecting bolt (6) that can be connected to the guide device (93; 93a) and that exhibits a bolt shaft (63) with a bolt head (62), a locking element (61), and a thread. The insert (33) of the first mounting piece (31) exhibits a channel (36) with channel walls (34) intended for the accommodation of the bolt shaft (63), a trough (39) intended for the accommodation of the bolt head (62), and a recess (37) intended for the accommodation of the locking element (61) that can be locked by means of a locking screw (53; 53a). The insert (43) of the second mounting piece (41) exhibits a recess (44) for the accommodation of the channel walls (34) as well as an opening (49) through which the bolt head (62) is accessible. The installed device (2) is adjusted in that the locking screws (53) are loosened a few turns and the connecting bolt (6) is turned until the desired height of the element (1) has been adjusted. Then the locking screws (53) are tightened again. The locking element (61), which is part of the connecting bolt (6), is enclosed within the device (2), for which reason the upper edge of the element (1) practically can be drawn up to the track (91, 91a).

P16815.S01

SUMMARY

The device (2) in accordance with the invention, which serves the joining of a sliding element (1), in particular a glass, metal, or wooden panel, with a guide device (93; 93a) that is guided in a track (91; 91a), exhibits a first and a second mounting piece (31; 41) that contain outer plates (32; 42) which can be joined together via an axle (35), and inserts (33; 43). The inserts (33; 43), which are fitted in a cutout (11) on the edge of the element (1) and connected with one another, enclose a connecting bolt (6) that can be connected to the guide device (93; 93a) and that exhibits a bolt shaft (63) with a bolt head (62), a locking element (61), and a thread. The insert (33) of the first mounting piece (31) exhibits a channel (36) with channel walls (34) intended for the accommodation of the bolt shaft (63), a trough (39) intended for the accommodation of the bolt head (62), and a recess (37) intended for the accommodation of the locking element (61) that can be locked by means of a locking screw (53; 53a). The insert (43) of the second mounting piece (41) exhibits a recess (44) for the accommodation of the channel walls (34) as well as an opening (49) through which the bolt head (62) is accessible. The installed device (2) is adjusted in that the locking screws (53) are loosened a few turns and the connecting bolt (6) is turned until the desired height of the element (1) has been adjusted. Then the locking screws (53) are tightened again. The locking element (61), which is part of the connecting bolt (6), is enclosed within the device (2), for which reason the upper edge of the element (1) practically can be drawn up to the track (91, 91a).

(Fig. 1)

P16815.S01

Device For Connecting A Displaceable Element To A Guide Device**Related Art**

5 To close room openings, sliding doors are often used that are suspended from a carriage that is guided on a track. For this purpose, a device is provided that is attached to the sliding door and connected to the carriage via a connecting bolt. From EP 0 733 766 A2, such a device is known that consists of a mounting piece that is screwed to a sliding wooden door and is intended for the accommodation of a connecting bolt that is screwed into the carriage. The head of the connecting bolt, which is mounted to rotate in the opened mounting
10 piece, can be fixed in place by means of a safety cover, by which the mounting piece is closed. By opening the safety cover, the connecting bolt of the mounting piece (and the sliding door) can be loosened or tightened, so that the height of the sliding door can be adjusted.

For sliding glass elements which are suspended from a carriage guided on a track, generally, two mounting pieces are required that enclose a glass element and are screwed to
15 one another in such a way that at least one bolt equipped with a thread is guided through an opening in the glass element, whereby said element is held by positive attachment to the bolt. By screwing together the two mounting pieces, which are drawn against the glass element located between them, a frictional attachment is generally also produced. Between the mounting pieces, for example, in a U-shaped cutout in the glass element, a screw that can be
20 connected with a carriage is mounted to rotate, by means of which the height of the glass element can be adjusted. In order to lock the connecting bolt in position, a lock nut is planned which is provided above the mounting pieces and thus above the glass element (this location is marked with the arrow "pos" in fig. 1). In the event that a lock nut is to be provided at the location shown, a relatively large distance must be selected between the track
25 and the glass element and the mounting pieces. Moreover, the protrusion of fasteners is also

P16815.S01

undesirable for aesthetic reasons or for safety reasons.

In principle, a safety cover could be provided, by which means the connecting bolt may be locked, as in the device in EP 0 733 766 A2, which is not intended for glass elements. However, doing so would result in increased expense in the manufacture and installation of the device.

Therefore, the task that forms the basis of the present invention is to create a device that can be manufactured, installed, and adjusted at low cost, by means of which a sliding element, especially a glass element, can be joined via an adjustable and lockable connecting bolt to a carriage that is guided on a track.

Summary of the Invention

In accordance with the invention, the device--which simply consists of two mounting pieces, preferably cast, a connecting bolt, several assembly screws, and, if necessary, two covers--can be manufactured at low cost. The connecting bolt is kept between the two mounting pieces and locked by means of preferably two screws that are provided between the mounting pieces and that need only be loosened a few turns for the adjustment of the connecting bolt. The space between the glass element or the mounting pieces and the guide track can thus amount to merely a few millimeters so that no trim piece is required. In addition, the required assembly screws and locking screws are preferably only accessible from one side of the device in accordance with the invention so that the other side of the device in accordance with the invention, advantageously facing outward, offers no access for (undesired) manipulations.

Brief Description of the Drawings

The invention is described in further detail below with the aid of a drawing by way of

P16815.S01

example. Shown thereby are:

- fig. 1 a device 2 in accordance with the invention joined to a glass element 1 and a carriage 93, which consists of two mounting pieces 31, 41 joined together and a connecting bolt 6;
- 5 fig. 2 a rear mounting piece 31 with the partially locked connecting bolt 6;
- fig. 3 a front mounting piece 41;
- fig. 4 the rear mounting piece 31 mounted on the underside of the glass element 1 with a guide piece 97 guided in a groove 98;
- fig. 5 a glass element 1 ready for installation of the device 2 in accordance with the invention;
- 10 fig. 6 a cross-sectional view of the glass element 1 from fig. 5 with the device 2 in accordance with the invention in place;
- fig. 7 an elastic liner 81;
- fig. 8 the connecting bolt 6;
- 15 fig. 9 a rear mounting piece 31a with the unlocked connecting bolt 6; and
- fig. 10 a front mounting piece 41a corresponding to the mounting piece 31a shown in fig. 9, which has a threaded hole 46a for a locking screw 53.

Detailed Description of the Preferred Embodiments

Fig. 1 shows a device 2 in accordance with the invention that is joined on one side with a glass element 1 and on the other side, via a connecting bolt 6 with a carriage 93 that is guided in a track 91 and that has a carriage body 94 and two wheels 95 that roll along a running surface 92 of the guide track 91. The connecting bolt 6, through which the distance between the glass element 1 and the guide track 91 may be adjusted, is screwed into a thread 96 provided in the carriage body 94. Also provided in the guide track 91 is a bracket 98 with a bumper 97 that serves the cushioning of the carriage. The bracket 98 carries a spring element 99 that holds the carriage 93 in place as soon as this touches with the bumper 97.

P16815.S01

Such carriages and associated tracks are known to the expert, for example, from EP 0 733 766 A2 or EP 0 305 634 A1. However, implementation of the solution in accordance with the invention is also possible with other carriages known to the expert.

5 In an advantageous embodiment, the device 2 in accordance with the invention consists of a rear mounting piece 31 shown in fig. 2 and a front mounting piece 41 shown in fig. 3, three assembly screws 54 and two locking screws 53 (see fig. 4) or 53a (see fig. 2) intended for locking the connecting bolt 6 that advantageously exhibits a tapered screw head. The locking screw 53a shown in fig. 2 has a screw head that is cut in such a way that the connecting bolt 6 is exposed once with each rotation of the locking screws 53a. As a result, 10 the element 1 equipped with the rear mounting piece 31 can be installed more easily. For this purpose, the connecting bolt 6 is screwed into the thread 96 provided in the carriage body 94. In addition, the two locking screws 53a are turned far enough until the cut surfaces of the screw heads face one another and the recess 37 is exposed for the accommodation of the locking element 61. Then the rear mounting piece 31 can be suspended from the connecting 15 bolt 6 without removing the locking screws. In the same way, the connection between the connecting bolt 6 and the mounting piece 31 can be released again.

Shown in fig. 1 is the front mounting piece 41, which is joined by the assembly screws 54 to the rear mounting piece 31. The head 62 of the connecting bolt 6 enclosed by the mounting pieces 31, 41 is accessible through an opening 49. The locking screws 53 (see fig. 20 2) are accessible through bore holes 46 so that the adjustment of the installed device 2 can occur with few manipulations and without the temporary removal of parts of the device. A screwdriver or wrench is inserted in the bore holes 46 thereby, after which the locking screws 53 and thus the connecting bolt 6 are loosened. Then a wrench is inserted into the opening 49, after which the connecting bolt 6 is adjusted. Finally, the locking screws 53 are tightened 25 again.

P16815.S01

The mounting pieces 31 and 41 are preferably designed in such a way that the rear mounting piece 31 serves the accommodation of the connecting bolt 6 as well as the transport of the glass element 1, which, as shown in fig. 5, exhibits a bore hole 12 provided for the accommodation of a supporting axle 35 and a cutout 11 for the accommodation of the interlocking mounting pieces 31, 41. A slot 13 is advantageously provided between the bore hole 12 and the cutout 11 to relieve stresses. The rear mounting piece 31 shown in fig. 2 thus exhibits an outer plate 32 on which the axle 35 to be inserted in the bore hole 12 and an insert 33 to be fitted into the cutout 11 are provided, which together exhibit three threaded holes 51 for the accommodation of the assembly screws 54.

Fig. 8 shows the connecting bolt 6, which exhibits a bolt head 62 and a locking element 61, which for example takes the shape of a threaded nut provided on the bolt shaft 63. The insert 33 exhibits a channel 36 serving the insertion of the bolt shaft 63 that is bounded by channel walls 34 which advantageously extend beyond the insert 33 by approximately one half the diameter of the bolt 6. The channel 36, is approximately half as deep as the diameter of the bolt 6, exhibits a recess 37 provided for the accommodation of a locking element 61. The bolt shaft 63 is thus accommodated practically completely by the channel 36 and the channel walls 34. Connecting to the channel 36, the insert 33 exhibits a trough 39 provided for the accommodation of the bolt head 62. Thereby, a collar 38, upon which the head 62 of the connecting bolt 6 is resting, is formed between the closed channel 36 and the channel walls 34. In the recess 37 on both sides of the locking element 61, threaded holes 52 are provided, into which the locking screws 53 or 53a can be screwed until the locking element 61 is locked. As already described, the locking screw 53a shown in fig. 2 exhibits a screw head that is cut in such a way that the connecting bolt 6 or the locking element 61 attached to the connecting bolt 6 is exposed once with each rotation of the locking screws 53a.

The recess 37 provided in the insert 33 and the trough 39 are delimited below by the

P16815.S01

outer plate 32, which advantageously exhibits no openings (bore holes, etc.) and thus offers no access to other parts of the device 2 in accordance with the invention. The outer plate 32 of the rear mounting piece 31 is preferably provided on the outside 15 of the glass element 1, whereby an undesired opening of the sliding glass door from the outside is prevented by the dismantling of the device 2 in accordance with the invention.

The rear mounting piece 31 shown in fig. 2 is, as shown in fig. 1, closed off by the front mounting piece 41 to be mounted on the inside of the glass element 1, which is described in greater detail with the aid of fig. 3. The front mounting piece 41 likewise exhibits an outer plate 42 and an insert 43 to be fitted into the cutout 11 of the glass element 1, which are fitted with three bore holes 45 which serve the transport of the assembly screws 54. The insert 43 also exhibits a recess 44, for the accommodation of the channel walls 34, as well as an opening 49 guided through the outer plate 42 and which is located above the trough 39 and offers access to the head 62 of the connecting bolt 6. In the recess 44 two bore holes 46 are provided, through which a screwdriver can be directed up to the locking screws 53 or 53a. So that the locking screws 53 or 53a each can be loosened adequately, recesses 47 concentric to the bore holes 46 are provided, into which the heads of the locking screws 53 or 53a can be turned. The size of the recess 44 is selected such that its upper surface closes the channel 36 or the channel walls 34 during the assembly of the mounting pieces 3, whereby the shaft 63 of the connecting bolt 6 is held with only slight clearance and the collar 38 is completed. All assembly elements (screws 6, 53 and 54) of the device 2 in accordance with the invention are thus accessible only on the inside 14 of the glass element 1.

Advantageously provided between the glass element 1 and the two mounting pieces 31, 41 are elastic liners 81 (the opening 82 serves the passing of the axle 35 to pass through), which prevents stresses from being transmitted by the assembled device 2 to the glass element 1.

P16815.S01

During the manufacture of glass element 1, it is planned that the diameter of bore hole 12 be larger than the diameter of axle 35. So that the axle 35, which is provided to carry the glass element 1, is held tightly in the bore hole 12, either an eccentric 85 or preferably a peg 83 with a projection 84 is provided that is pressed into the opening 12 and the slot 13 and is subsequently fitted with a bore hole running concentrically to the axle 35. A rotation of the peg 83 is thereby hindered by the projection 84. As a pattern for the bore hole, the front mounting piece 41 can be used, for example.

In fig. 6, a cross-section SS of the glass element 1 is shown with installed mounting pieces 31, 41. It can be seen hereby that the inserts 33, 43 extend into the cutout 11 and the outer plates 32, 42, separated from it by the liners 81, lie against the sides 15, 14 of the glass element 1. The outer plates 31, 41 are advantageously fitted with retaining grooves 48 into which the covers 7 can be slid.

The device 2 in accordance with the invention is thus of particular advantage because, among other things, the assembly screws and locking screws are accessible from one side only (normally from the inside of the locked room). For this reason, the axle 35 fitted with a threaded hole 51 is also placed on the rear mounting piece 31. Likewise, the design of the connecting bolt 6 and the placement of the channel 36, the channel walls 34 and the locking screws 53 are selected in a particularly advantageous manner. Additional designs of the device 2 in accordance with the invention are easily possible within the scope of expert action. For example, the number and arrangement of the assembly screws and locking screws 51, 54 or the design of the connecting element 6 or the locking element (lock nut) 61 can be changed as desired. In addition, the positions of the recess 37 and the trough 39 with the associated opening 49 could be exchanged, whereby the lock nut 61 and bolt head 62 exchange their functions. Further design possibilities also exist with regard to the arrangement of the locking screws 53. In fig. 9 the insert 33a of a rear mounting piece 31a exhibits a channel 36a with channel walls 34a, which surround a recess 37a in which no threaded holes are provided for

P16815.S01

locking screws. A threaded hole 46a for a preferably countersinking locking screw 53 is provided in the outer plate 42a of the front mounting piece 41a, as shown in fig. 10. Through the outer plate 43a, the locking screw 53 can be screwed into the recess 44a of the insert 43a until it contacts the locking element 61 and fixes it in place. The device shown in fig. 9 and
5 fig. 10 is simple to manufacture. It is potentially of advantage, however, if the connecting bolt 6 can be fixed in place before the front mounting piece is installed.

The device 2 in accordance with the invention serves particularly the hanging of glass elements. Of course, however, the device 2 in accordance with the invention can be installed on panels of any desired type. The device 2 can also be used particularly advantageously for
10 the hanging of thin metal or wooden panels. The use of an elastic liner 81 is preferably omitted thereby.

The device 2 in accordance with the invention is preferably used for the joining of a sliding element 1 with a carriage 93 that is guided in a track 91 provided above the element 1. However, fig. 4 shows that the device 2 in accordance with the invention is also
15 advantageously suited for the joining of the element 1 with a guide piece 93a that is guided in a bottom track or groove 91a provided on the ground. The guide piece 93a consists preferably of an internally threaded cylinder that is vertically displaceable in the channel 36 and into which the connecting bolt 6 is screwed. The cylinder preferably exhibits axially oriented corners that are guided along the channel walls 34 and thus that prevent rotation of
20 the cylinder within the channel 36. By turning the connecting bolt 6, the guide piece 93a can therefore be lowered in the bottom guide track 91a.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A device for connecting a sliding element with a guide device, the guide device adapted to be guided in a track, the device comprising:

an axle;

a first mounting member having a first outer plate and a first insert;

a second mounting member having a second outer plate and a second insert, said first and second outer plates adapted to be joined by said axle, said first and second inserts adapted to be inserted into a cutout provided on an edge of the sliding element, said first and second inserts further adapted to be connected with one another;

a connecting bolt enclosed by and positioned intermediate said first and second inserts, and adapted to be connected to the guide device, said connecting bolt comprising a shaft having a head, a locking element and a thread;

wherein said first insert comprises:

a channel having channel walls adapted to accommodate said shaft therein;

a trough adapted to accommodate said head;

a first recess adapted to accommodate said locking element; and

a locking screw adapted to lock said locking element; and

wherein said second insert has an opening and comprises a second recess adapted to accommodate said channel walls therein, and wherein a radial center of said opening is substantially coaxial to a radial center of said head.

2. The device in accordance with claim 1, wherein said first recess has at least one threaded hole adapted to receive said locking screw, said recess being externally accessible through a bore provided in said second mounting member.

3. The device in accordance with claim 1, further comprising:

a screw;

wherein said second outer plate has a threaded hole adapted to receive said screw therein, said screw adapted to rotate in said threaded hole until said screw contacts said locking element.

4. The device in accordance with claim 3, wherein said screw is a countersinking locking screw.

5. The device in accordance with claim 1, wherein a depth of said channel and a height of said channel walls are approximately equal to the diameter of the shaft of said connecting bolt.

6. The device in accordance with claim 5, wherein:

said axle is adapted to be inserted through a hole provided in the sliding element, said axle located on said first outer plate, said axle having a threaded hole adapted to receive an assembly screw;

said second mounting member has a second mounting member hole; and

said assembly screw is adapted to be inserted through said second mounting member hole into said threaded hole of said axle.

7. The device in accordance with claim 6, further comprising one of:

an eccentric adapted to be inserted into said sliding element hole and having an opening adapted to accommodate said axle therethrough; and

a hole insert adapted to be inserted into said sliding element hole and having an axle hole adapted to accommodate said axle therethrough, said axle hole being concentric to said axle.

8. The device in accordance with claim 7, wherein said hole insert further comprises a projection adapted to be inserted into a slot provided in said locking element, said slot connecting said locking element hole and said cutout.

9. The device in accordance with claim 6, wherein:

said second mounting member has at least an additional second mounting member hole adapted to receive at least one assembly screw;

said first insert has at least one threaded hole; and

said at least one assembly screw is adapted to be threadedly screwed into a respective said at least one threaded hole of said first insert.

10. The device in accordance with claim 1, wherein said first outer plate has no openings to provide external access to the contents of the device.

11. The device in accordance with claim 10, wherein said first outer plate is located on an outer surface of the sliding element.

12. The device in accordance with claim 1, wherein the device is installed on a top or on a bottom of the element, and is further adapted to be connected to one of a carriage and a guide piece guided in a track.

13. The device in accordance with claim 1, wherein said locking screw has a screw head that is configured such that said connecting bolt may be freely rotated in association with at least one rotational position of said locking screw.

14. The device in accordance with claim 1, wherein the sliding element is one of glass, metal, or wood.

HAWA AG 01/97

1/4

Fig. 1

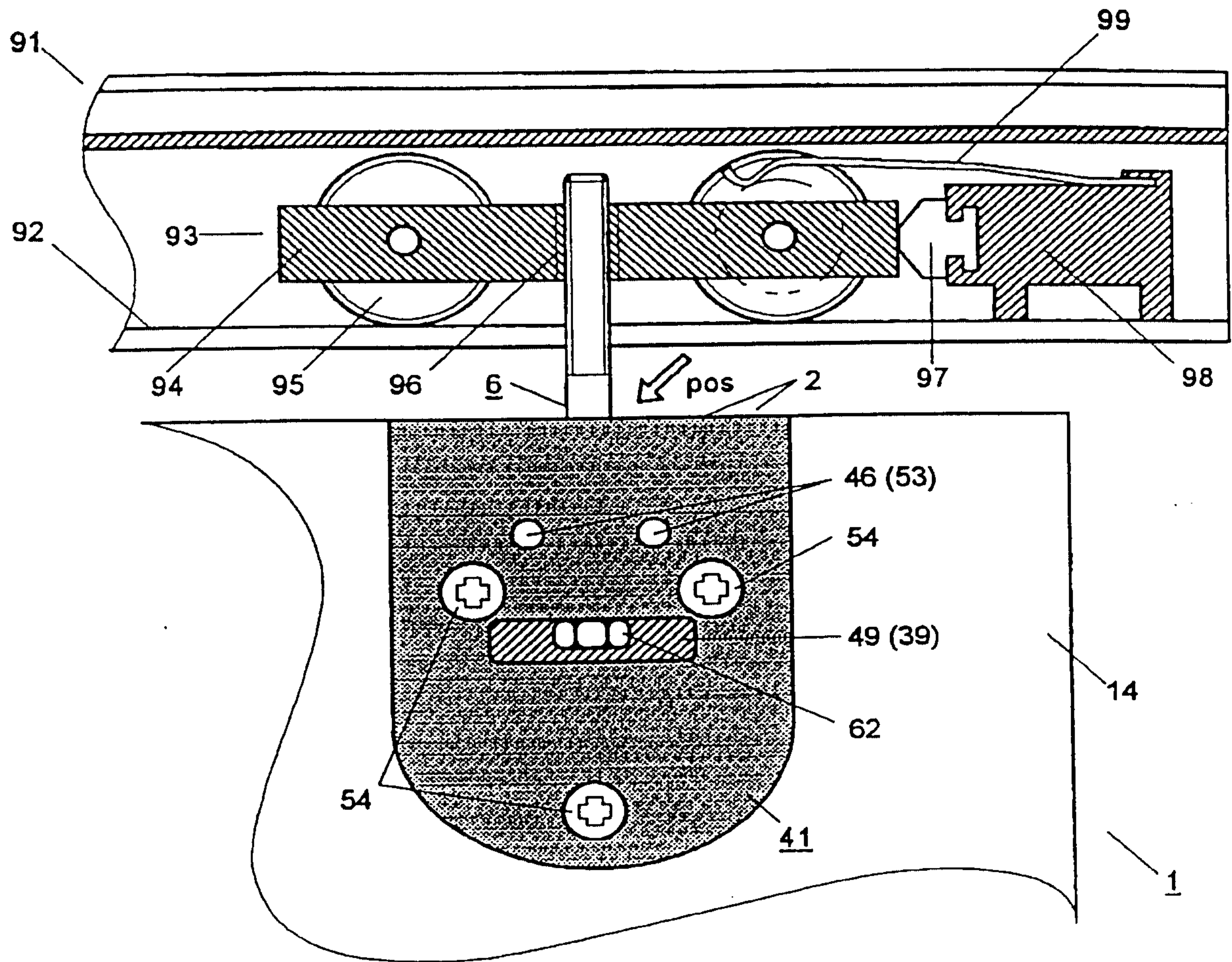


Fig. 7

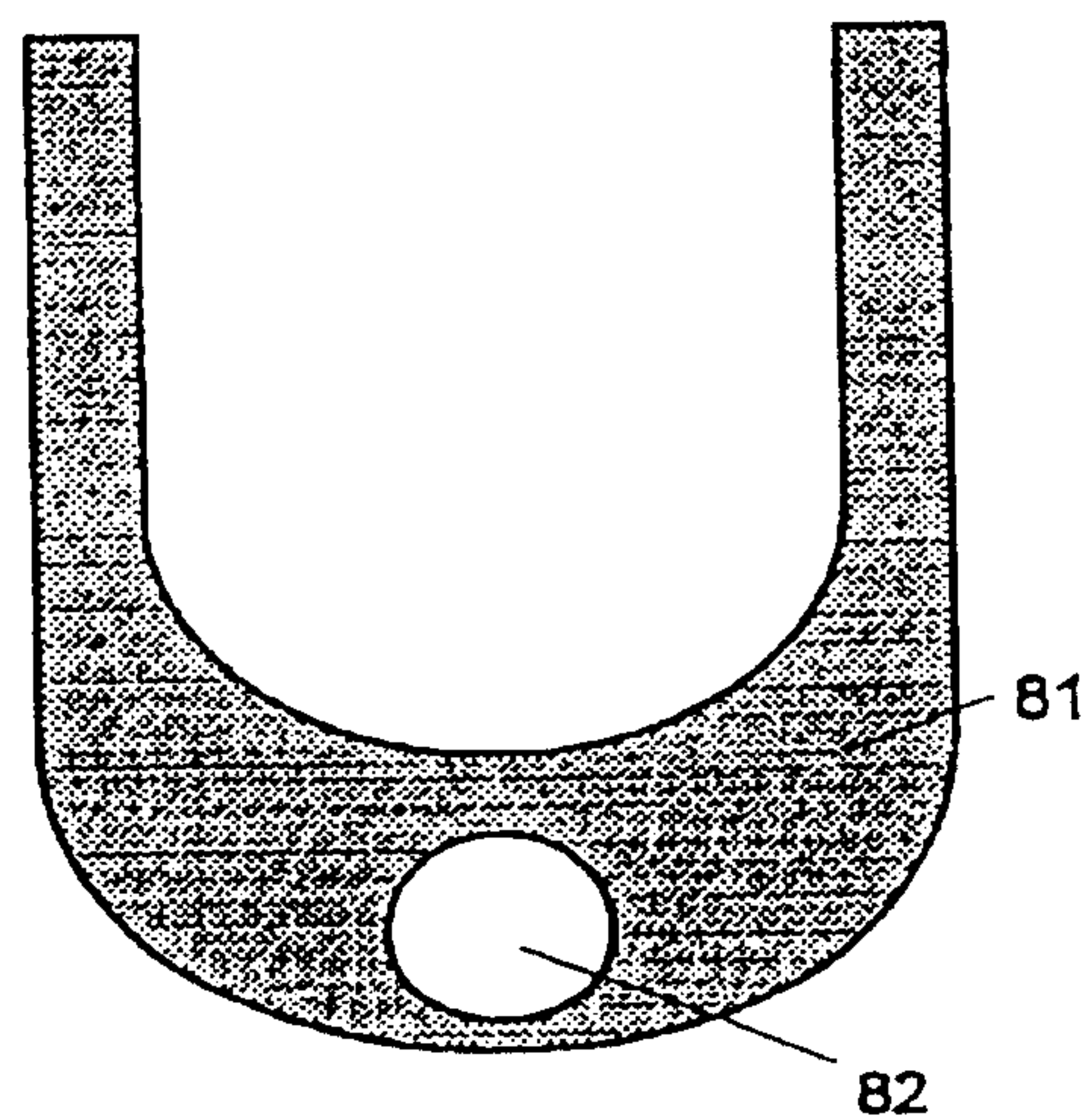
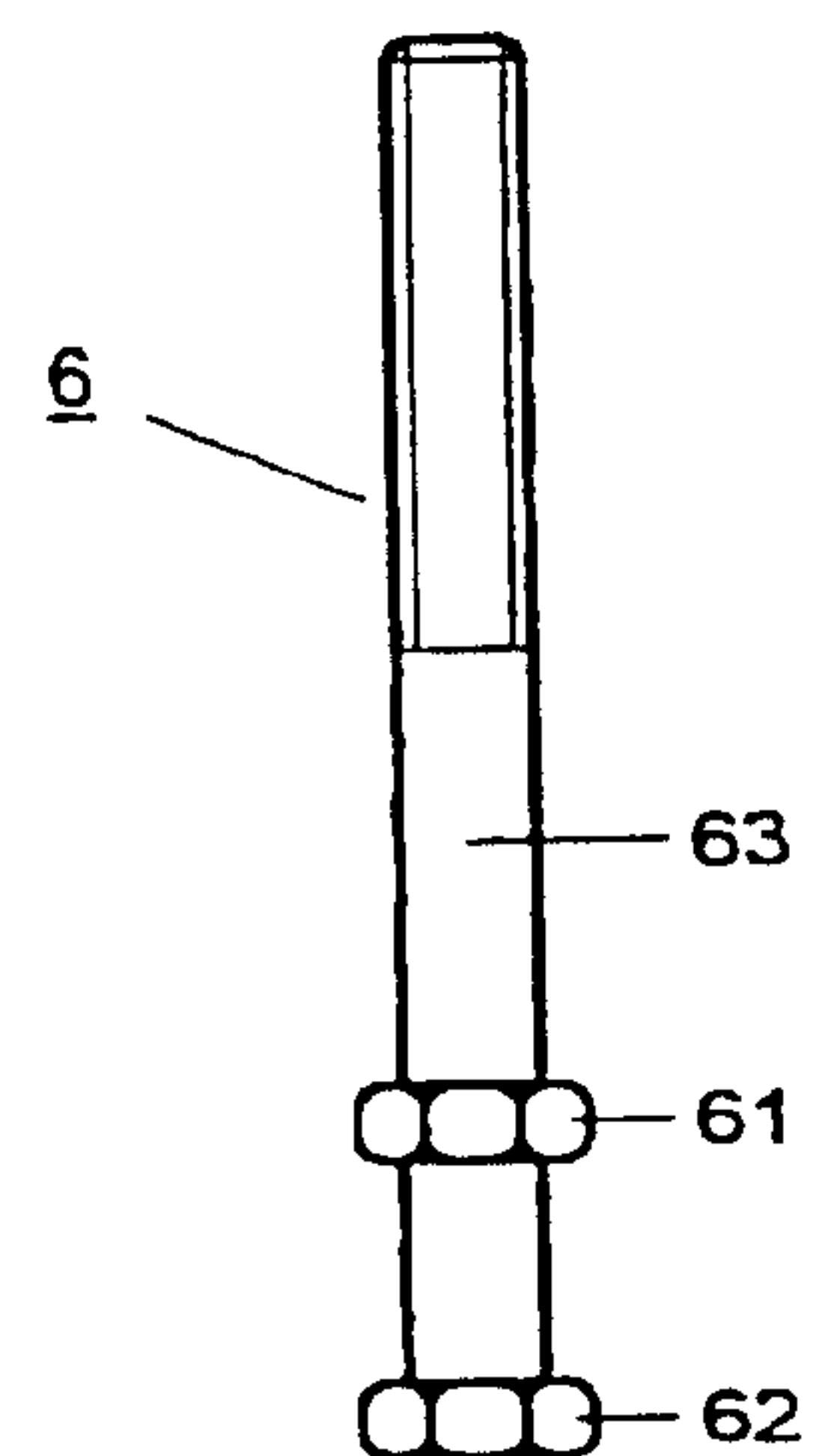


Fig. 8



HAWA AG 01/97

2/4

Fig. 2

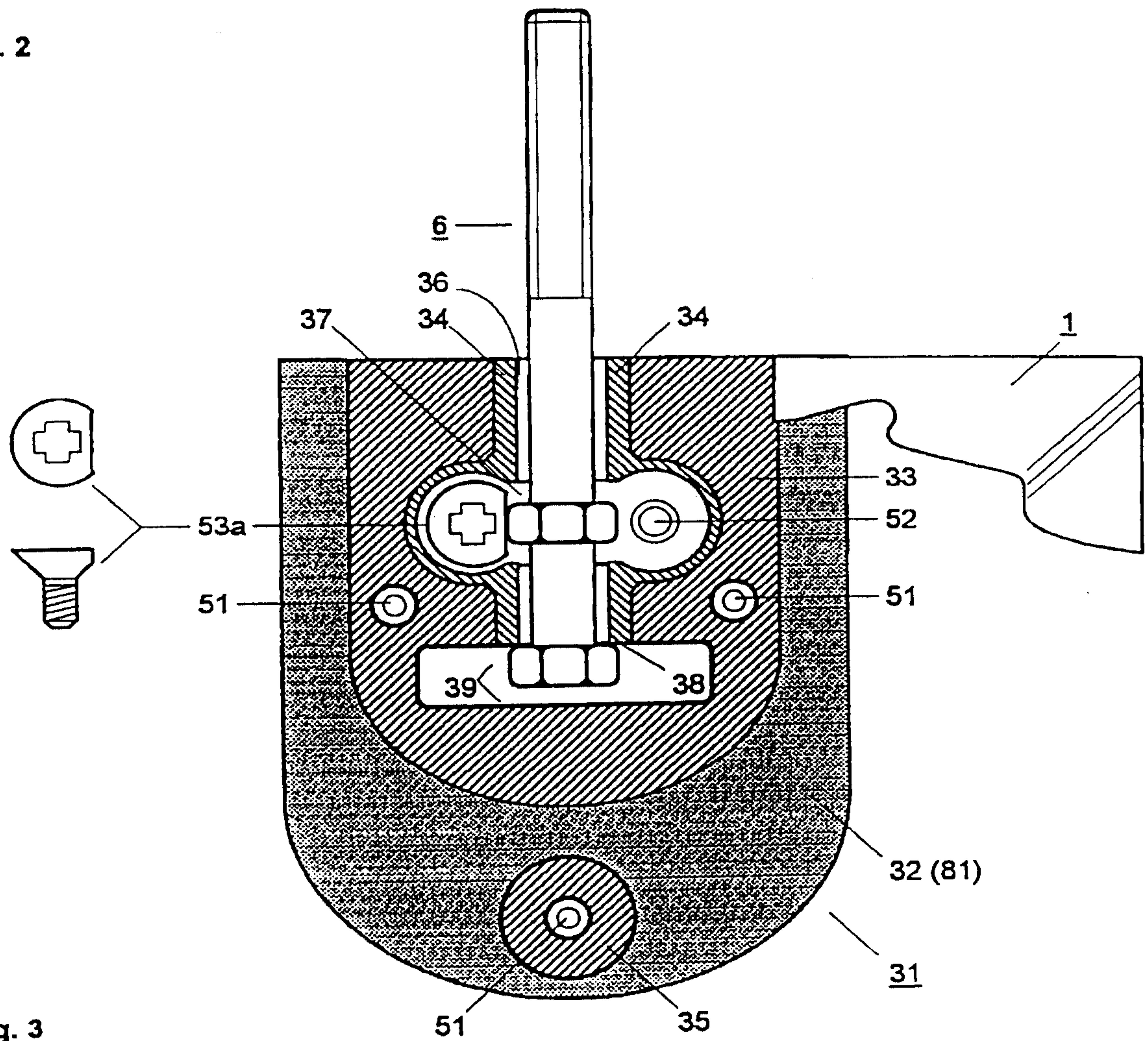
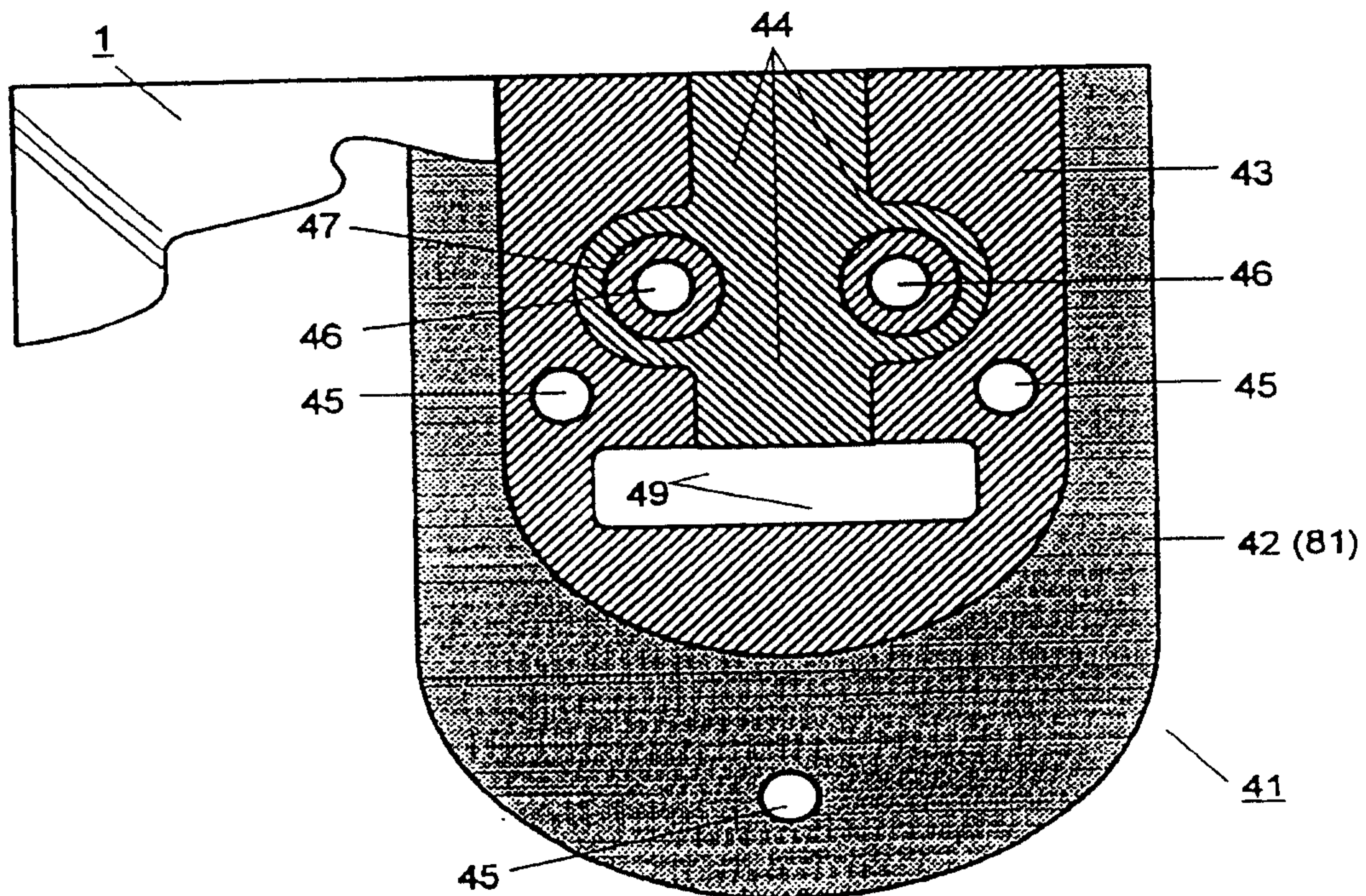


Fig. 3



HAWA AG 01/97

3/4

Fig. 4

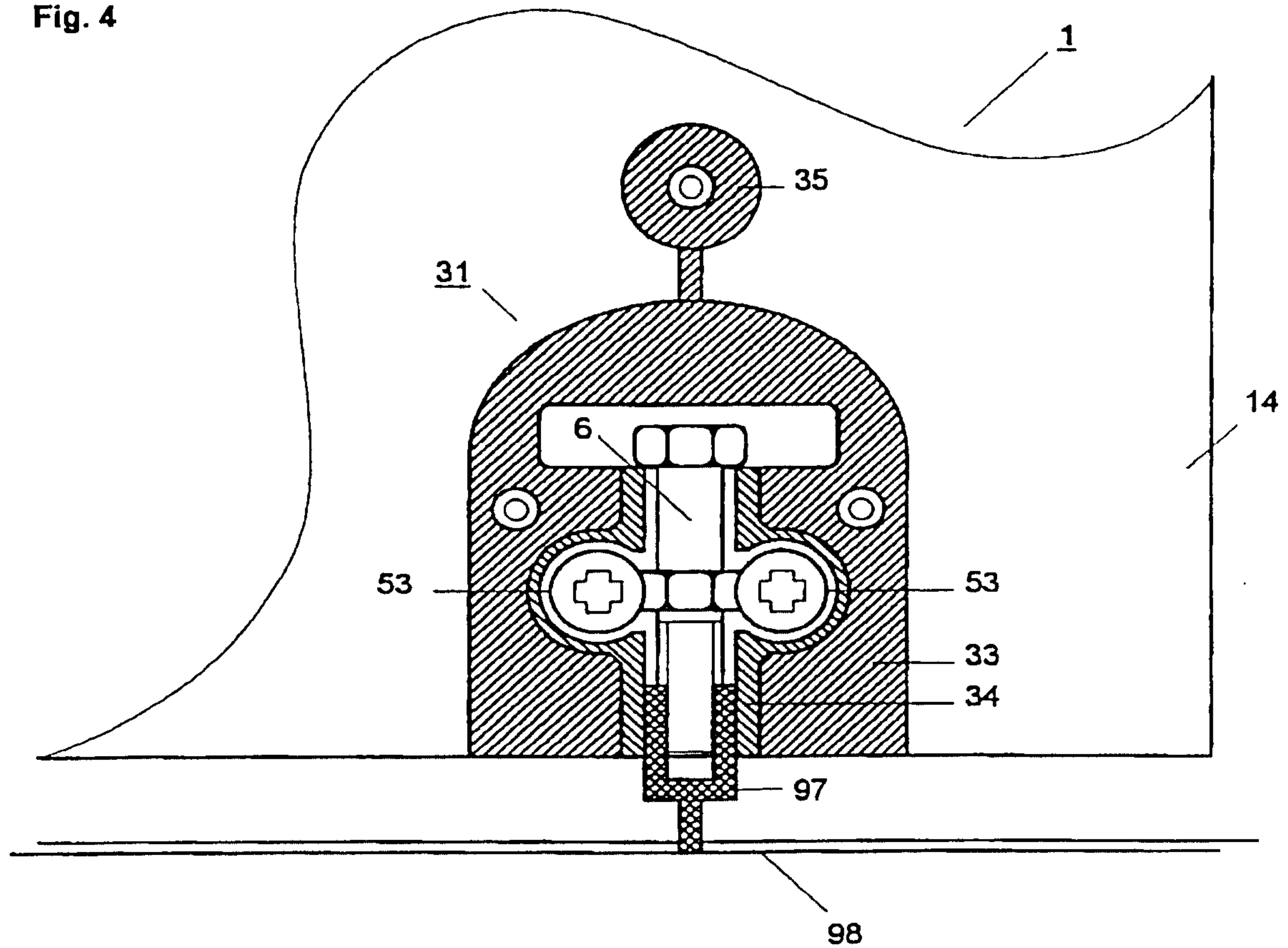


Fig. 5

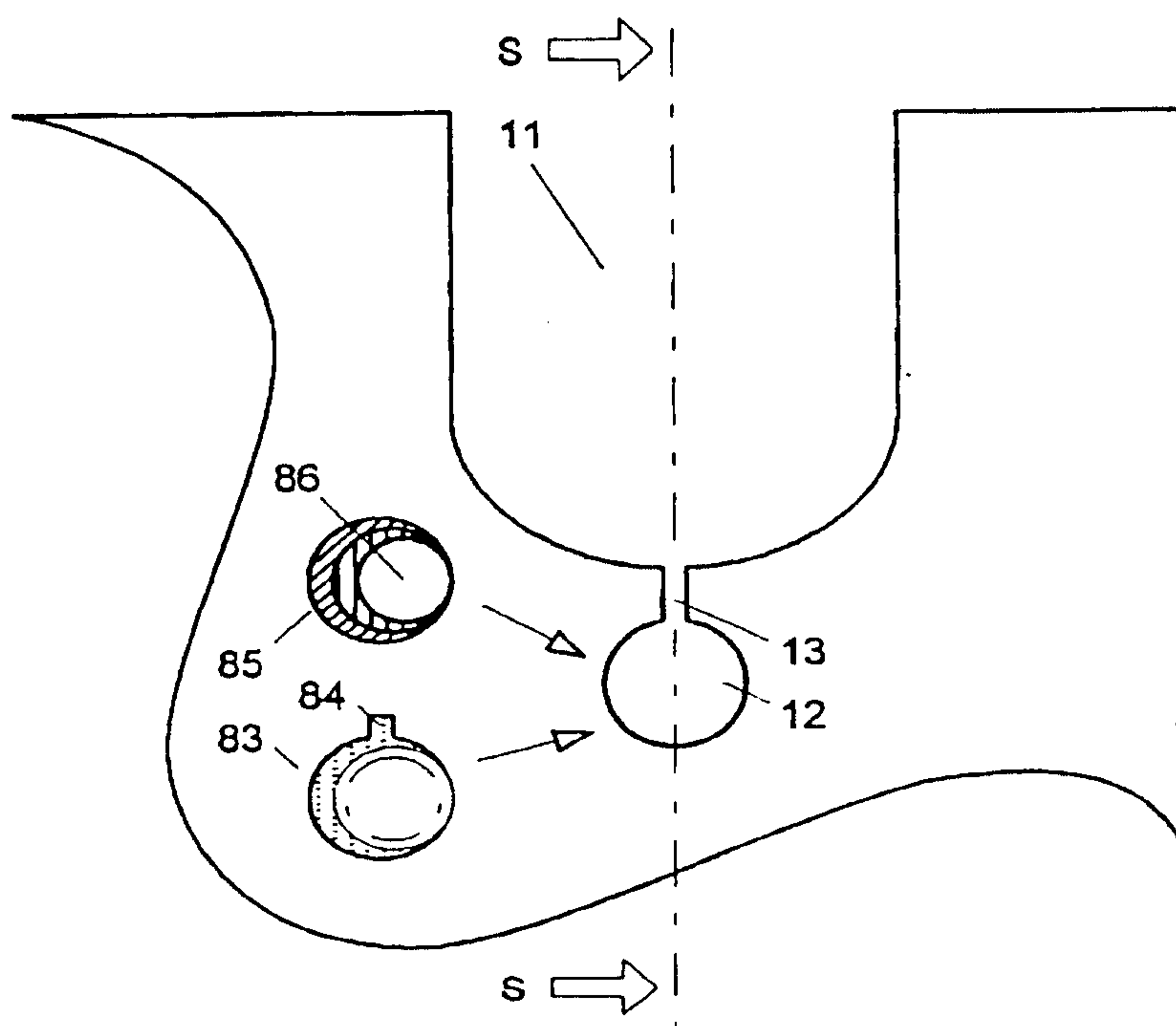
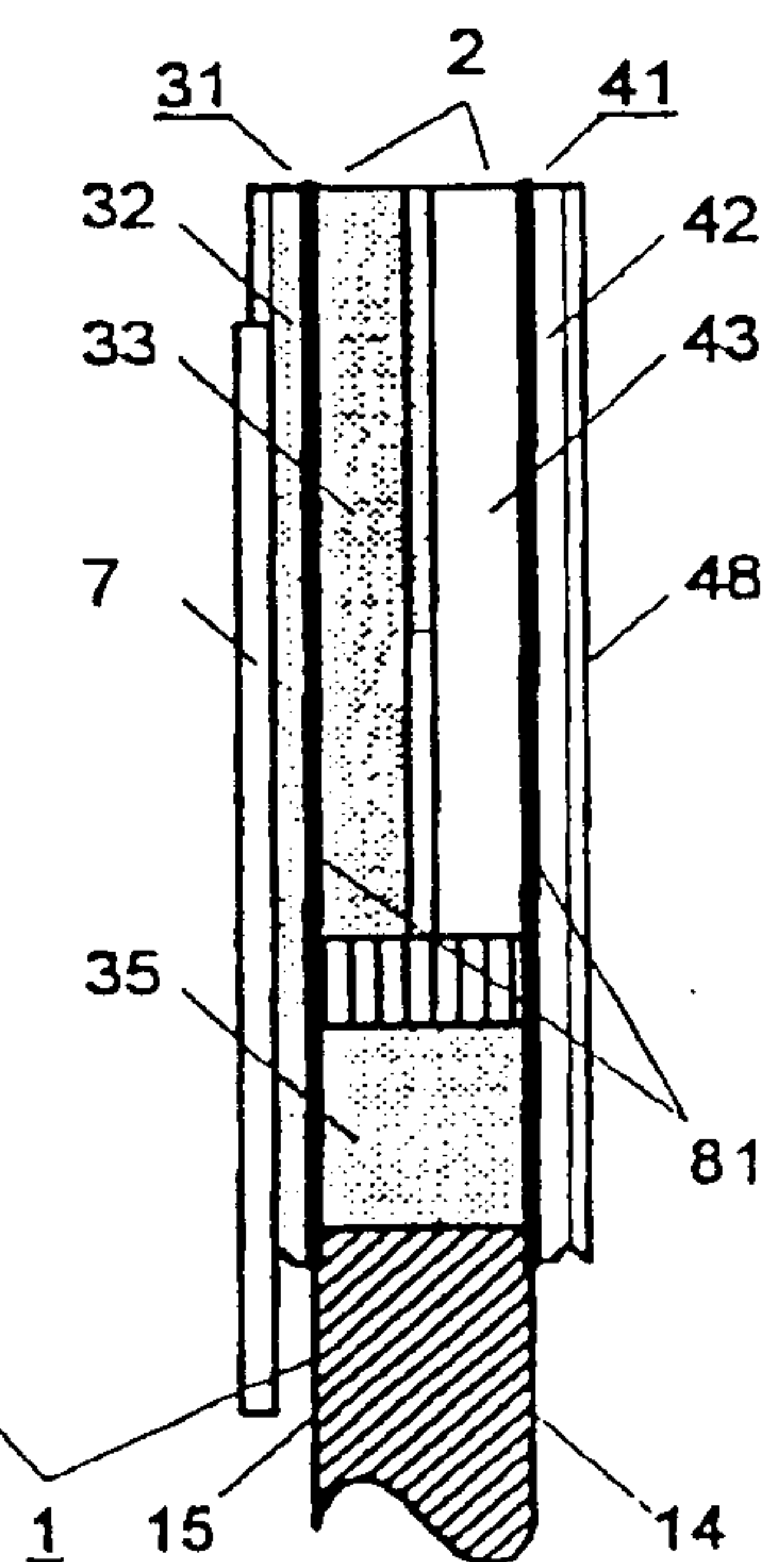


Fig. 6



HAWA AG 01/97

4/4

Fig. 9

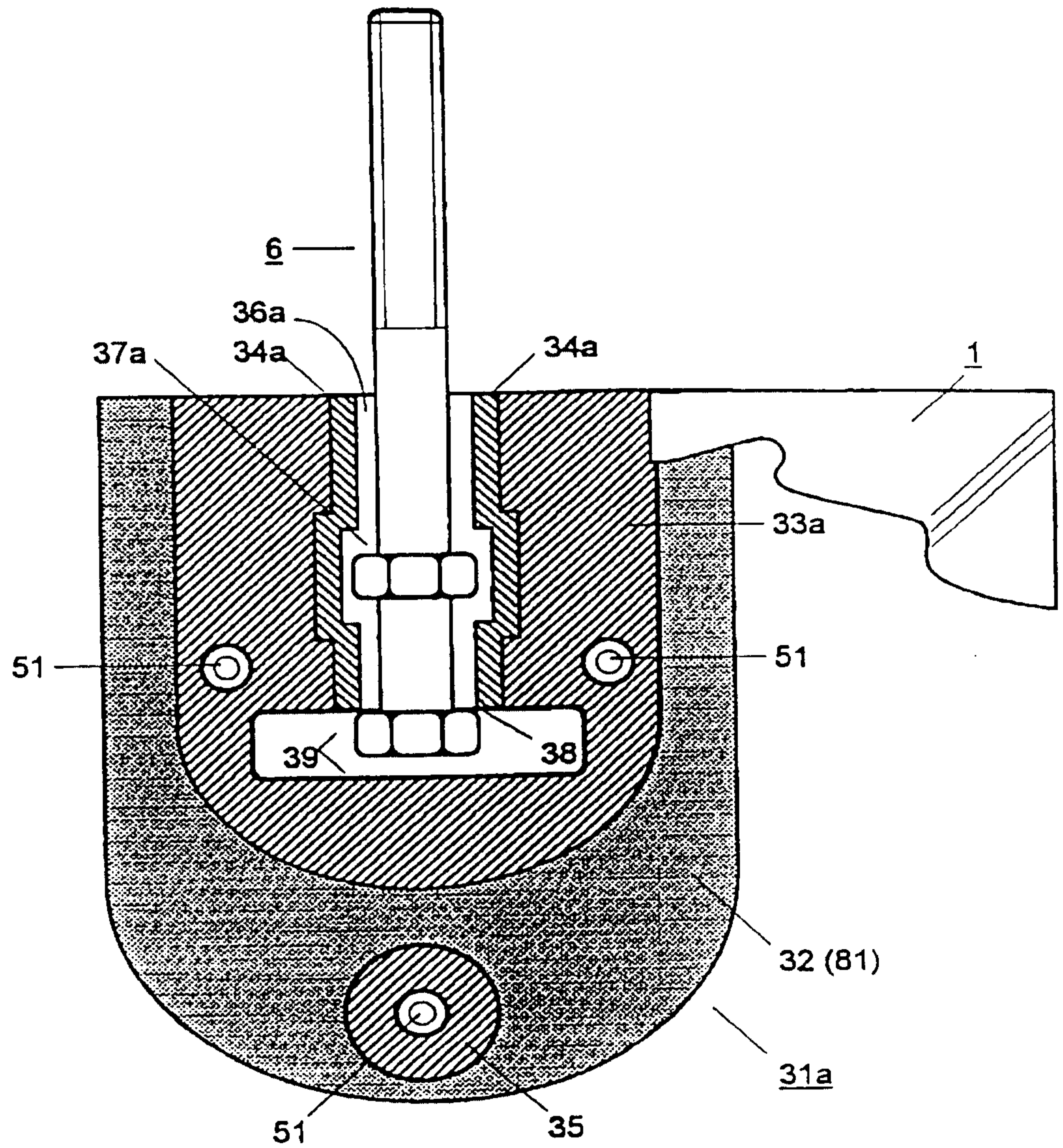


Fig. 10

