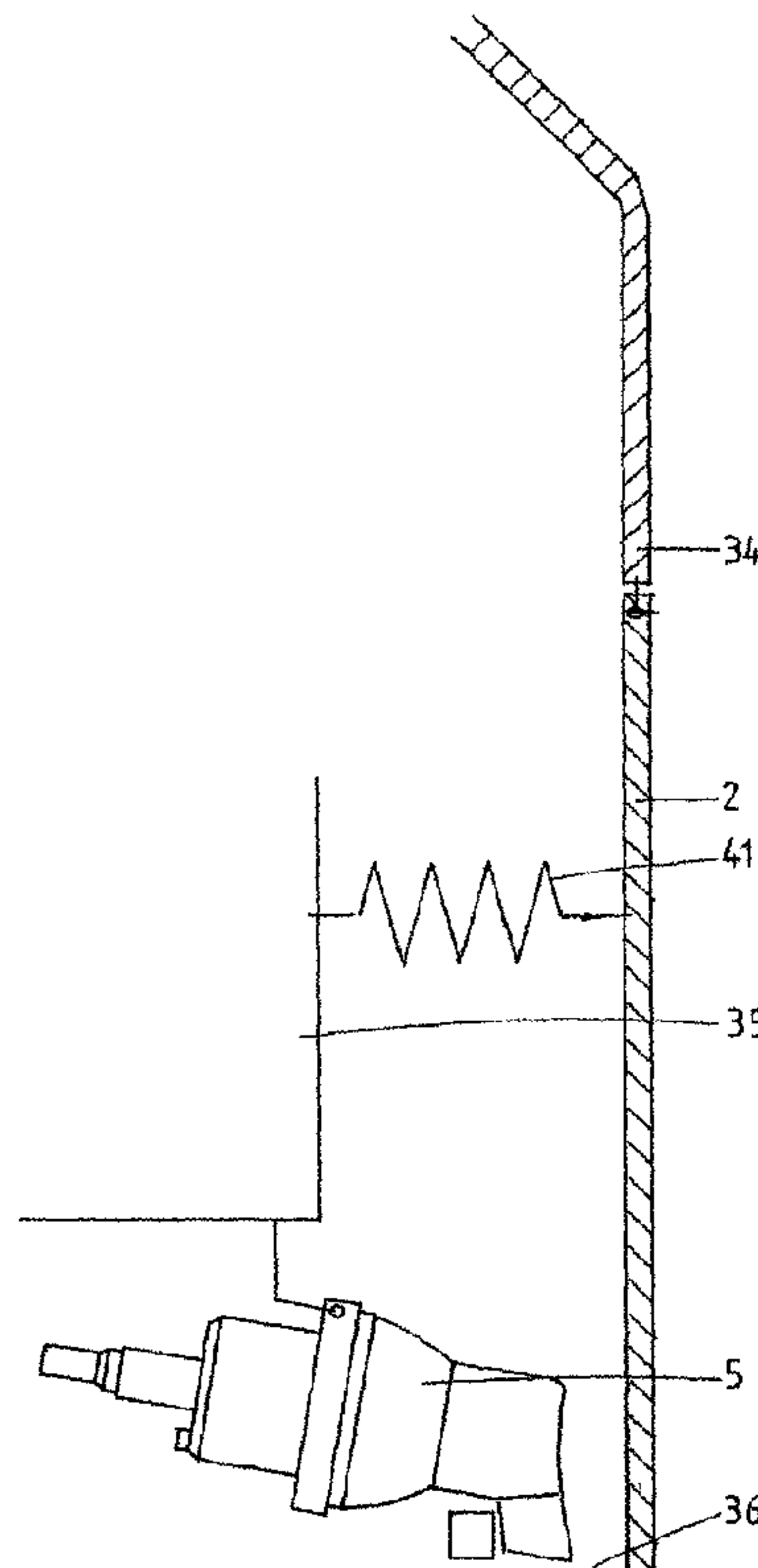




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(54) Title: DISPENSER FOR DISPENSING A FLUID, HOUSING FOR SUCH A DISPENSER, STORAGE HOLDER  
DESTINED FOR PLACEMENT THEREIN AND ARRANGEMENT FOR THE DOSED PUMPING OF A FLUID FROM  
A FLUID RESERVOIR



(57) **Abrégé/Abstract:**

A dispenser for the dispensing of a fluid, comprises a housing, fluid reservoir (3), placed in the housing, a pump (5) connected to the fluid reservoir (3), which comprises a nozzle (4) protruding from the pump (5) and an operating part (6), wherein, upon



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

movement of the operating part (6) from an initial position in which flow of fluid through the pump from the fluid reservoir (3) to the nozzle (4) is substantially prevented, in a direction of pumping, fluid is pumped from the fluid reservoir (3) to the nozzle (4). The dispenser is further provided with resilient means (41, 43, 46), supported by the housing and with an engagement mechanism connected to the resilient means (41, 43, 46), which, upon movement of the operating part (6) from the initial position, exert a force opposed to the direction of pumping on the operating part (6) through the engagement mechanism. The nozzle (4) forms part of the operating part (6) and is at an angle relative to the direction of pumping. The engagement mechanism externally engages an area (39) of a part of the nozzle (4) protruding from the operating part.

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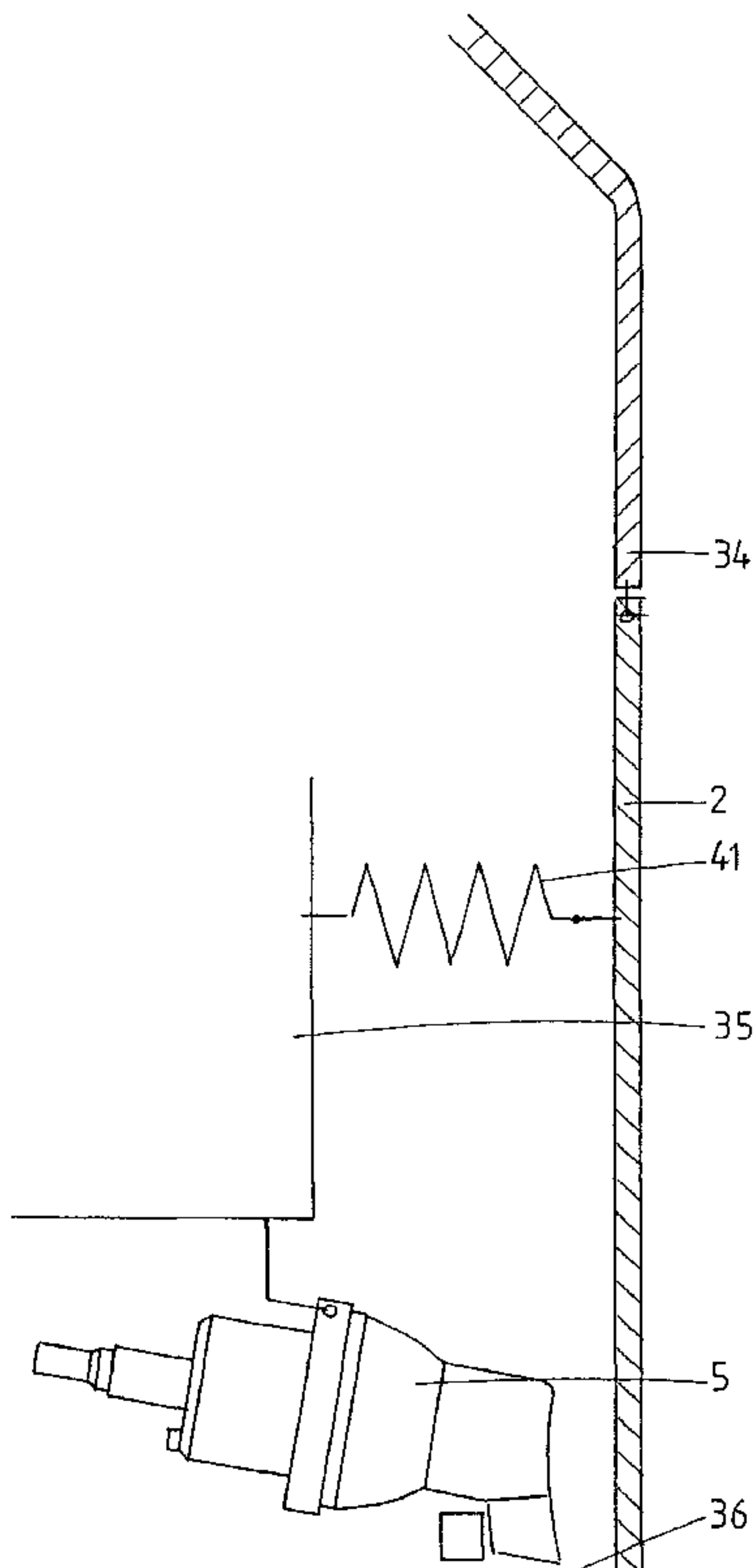
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(54) Title: DISPENSER FOR DISPENSING A FLUID, HOUSING FOR SUCH A DISPENSER, STORAGE HOLDER DESTINED FOR PLACEMENT THEREIN AND ARRANGEMENT FOR THE DOSED PUMPING OF A FLUID FROM A FLUID RESERVOIR



(57) Abstract: A dispenser for the dispensing of a fluid, comprises a housing, fluid reservoir (3), placed in the housing, a pump (5) connected to the fluid reservoir (3), which comprises a nozzle (4) protruding from the pump (5) and an operating part (6), wherein, upon movement of the operating part (6) from an initial position in which flow of fluid through the pump from the fluid reservoir (3) to the nozzle (4) is substantially prevented, in a direction of pumping, fluid is pumped from the fluid reservoir (3) to the nozzle (4). The dispenser is further provided with resilient means (41, 43, 46), supported by the housing and with an engagement mechanism connected to the resilient means (41, 43, 46), which, upon movement of the operating part (6) from the initial position, exert a force opposed to the direction of pumping on the operating part (6) through the engagement mechanism. The nozzle (4) forms part of the operating part (6) and is at an angle relative to the direction of pumping. The engagement mechanism externally engages an area (39) of a part of the nozzle (4) protruding from the operating part.

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Dispenser for dispensing a fluid, housing for such a dispenser, storage holder destined for placement therein and arrangement for the dosed pumping of a fluid from a fluid reservoir

The invention relates to a dispenser for the dispensing of a fluid and to a housing for a dispenser for the dispensing of a fluid, according to the preamble of claims 1 and 11, respectively. The invention further relates to a  
5 storage holder, destined for placement in a dispenser for the dispensing of a fluid, according to the preamble of claim 12. The invention further relates to an arrangement for the dosed pumping of a fluid from a fluid reservoir, according to the preamble of claim 14.

10           Embodiments of such a dispenser, housing and storage holder are known from W095/26831. The pump comprises two enclosures, of which the second is telescopically received in the first. In assembled stage, the two enclosures define an air chamber and a fluid chamber. When the second enclosure is  
15 moved relative to the first, air is expelled from the air chamber and fluid from the fluid chamber. The dispenser comprises a pushbutton, which is pivottingly connected to it, which is coupled to the second enclosure, so that the pump is actuated when the pushbutton is moved. The second enclosure is  
20 locked to a movable yoke-shaped platform, upon assembly. Springs push the platform away from a yoke-shaped supporting platform, which is rigidly attached to a rear wall of the housing. When the pushbutton is pressed, it pivots around a point of rotation whereby arms are rotated, so that the ends of  
25 the arms move the platform up from a lower position against the action of the springs. The release of the pushbutton results in the platform being returned to the lower position by the springs.

A disadvantage of the known arrangement is that the engagement mechanism is complex. Because the nozzle points downwards and the direction of pumping is parallel to the direction in which fluid is dispensed, whereas the user exerts  
5 a force in a direction which is mainly perpendicular thereto, a complex transmission mechanism is necessary. For this reason, amongst others, the dispenser is entirely adapted for use of one type of pump.

It is an object of the invention to provide a  
10 dispenser housing and storage holder of the types mentioned above wherein after use, the operating part is returned to its leakage-free initial position in a simple and effective manner.

To this end, the dispenser according to the invention is characterised in that the nozzle forms part of the operating  
15 part and is at an angle relative to the direction of pumping, and in that the engagement mechanism externally engages an area of a part of the nozzle protruding from the operating part.

Because the nozzle is at an angle relative to the direction of pumping, it is possible to arrange the pump in  
20 such a manner that the user exerts a pumping force in a natural manner with the palms of his hand or the wrist in an approximately horizontal direction, whereby the fluid is pumped from the nozzle into the extended part of the hand, in particular the fingers. This is in general customary for such  
25 pumps which are produced in many variants. Because the engagement mechanism engages the protruding part of the nozzle externally, it is suited for a large number of these variants, without adaptation to the pump being necessary. Special arrangements for allowing the engagement mechanism to engage  
30 the operating part of the pump are not necessary.

In a preferred embodiment of the dispenser the pump and the fluid reservoir are removably housed in the housing, wherein the engagement mechanism is preferably part of the housing.

The design is thus substantially independent of the specific embodiment of the pump. No further adaptations to the pump are necessary, due to which the pump is substitutable for another pump also having a nozzle at an angle relative to the direction of pumping. It is thus also possible to make use of a pump designed for a different application, for example for spray cans.

The housing for a dispenser for the dispensing of a fluid according to the invention, is characterised in that the housing is suitable for placement of a storage holder of which the pump is provided with a nozzle forming part of the operating part and at an angle relative to the direction of pumping, and in that the engagement mechanism externally engages an area of a part of the nozzle protruding from the operating part, upon placement of the storage holder.

Thus, a housing is provided which is suitable as part of a modular system. The storage holder forms a second module therein. Because the engagement mechanism externally engages a protruding part of the nozzle, no special adaptations of the pump of the storage holder are needed. Although a part for a modular system is thus provided, the modular system is flexible in the sense that the modules need not be adapted to each other in a special manner. It is thus also possible to make use of a storage holder which is provided with a pump designed for other applications.

The storage holder according to the invention is characterised in that the storage holder is provided with resilient means supported by the exterior of the storage holder and engaging the exterior of the operating part, which resilient means exert a force opposed to the direction of pumping on the operating part, upon movement of the operating part from an initial position.

Thus, no further adaptations to the housing are necessary to ensure that the pump returns to its leakage-free

position after each stroke of the pump. Due to the use of external resilient means, it is not necessary to adapt the pump. One can therefore make use of cheap consumer pumps, which  
5 themselves contain no or merely weak resilient means. The external resilient means prevent such pumps from jamming after a short period of use and from starting to leak.

US 5 556 005 discloses a dispenser including  
10 a hand actuated lever pivotally mounted to a housing containing a pump mechanism. The pump mechanism may be a standard pump for dispensing liquids and includes an L-shaped piston having a cylindrical arm extending vertically and a  
15 cylindrical horizontal arm. A discharge outlet is located at the lower end of the vertical arm. A ball valve is located adjacent to the discharge outlet. A spring acts on the horizontal arm to bias the piston in the open position.

20 An embodiment of an arrangement for the dosed pumping of a fluid from a fluid reservoir as defined in the preamble of claim 1, is known from US-6 053 365.

The known arrangement concerns an apparatus  
25 for the dispensing of an air-fluid mixture. It comprises a pump unit comprising at least an air pump and a fluid pump, which are essentially concentric and each comprise a piston chamber with a piston moveable therein. Each pump  
30 comprises an inlet and an outlet. An operating part is present for operating the two pumps, which forms a whole with a piston of the fluid pump. By means of a covering part with a sealing

4a

ring and an internal thread, the pump unit can be screwed over an opening in a fluid holder.

The known arrangement is meant for screwing onto bottlenecks. When the arrangement is not  
5 screwed onto a bottleneck, it falls apart, because the first and second part are pushed apart upon actuation of the piston. The bottleneck therefor provides the necessary connection. The disadvantage, however, is that  
10 the pump and bottleneck must be matched to each other, which restricts the possibilities of application of the arrangement.

US 5 449 094 discloses a dispenser comprising a casing having a drum housing a piston which  
15 serves as a movable base. A sleeve houses a distributor pump. Its body is closed by its collar, which retains the piston. The diaphragm of the sleeve carries a central orifice bordered by a seating, against which the lower end of the  
20 pump, where its intake is located, fits in sealing manner during assembling, an outer bearing face and a well in which the body is housed, its flange finally fixing the pump by means of its collar.

25 It is partly an object of the invention to provide an arrangement of the type mentioned in the preamble to claim 14, which is suited for a broader spectrum of applications.

This objective is achieved by the arrangement  
30 according to the invention wherein the arrangement is further provided with a coupling piece having a neck matching the collar of the first part.

11 09. 2003

**Insertion sheet A**

(12)

[new paragraph]

US 5 556 005 discloses a dispenser including a hand actuated lever pivotally mounted to a housing containing a pump mechanism. The pump mechanism may be a standard pump for dispensing liquids and includes an L-shaped piston having a cylindrical arm extending vertically and a cylindrical horizontal arm. A discharge outlet is located at the lower end of the vertical arm. A ball valve is located adjacent to the discharge outlet. A spring acts on the horizontal arm to bias the piston in the open position.

[new paragraph]



## Insertion sheet B

[new paragraph]

US 5 449 094 discloses a dispenser comprising a casing having a drum housing a piston which serves as a movable base. A sleeve houses a distributor pump. Its body is closed by its collar, which retains the piston. The diaphragm of the sleeve carries a central orifice bordered by a seating, against which the lower end of the pump, where its intake is located, fits in sealing manner during assembling, an outer bearing face and a well in which the body is housed, its flange finally fixing the pump by means of its collar.

[new paragraph]

The coupling piece provides the necessary connection in the arrangement. It can thus by itself be connected to a multitude of fluid reservoirs, also those which have no specially adapted neck. Furthermore, the arrangement can be mounted in fluid dispensers for industrial application with the aid of the coupling piece.

In accordance with an aspect of the present invention, there is provided a dispenser for the dispensing of a fluid, comprising:

- 10 a housing;
- a fluid reservoir placed in the housing;
- a pump connected to the fluid reservoir, the pump having: a nozzle protruding therefrom;
- an operating part having an initial position and at least one pumping position in which fluid is pumped from the fluid reservoir to the nozzle; and
- 15 a piston that moves with the operating part in substantially the same direction as the operating part, the piston positionable in an opening when the operating part is in the initial position to substantially prevent flow of fluid through the pump to the nozzle;
- 20 a resilient element supported by the housing; and
- an engagement mechanism connected to the resilient element, which, upon movement of the operating part from the initial position, exerts a force opposed to a direction of pumping on the operating part through the engagement mechanism,
- 25 wherein the nozzle forms part of the operating part and is at an angle relative to the direction of pumping, and
- 30 wherein the engagement mechanism externally engages an area of a part of the nozzle protruding from the operating part.

5a

In accordance with another aspect of the present invention, there is provided a housing for a dispenser for the dispensing of a fluid, configured to receive a removable storage holder of the type comprising:

5           a fluid reservoir; and  
          a pump connected to the fluid reservoir and  
including: a nozzle protruding therefrom; and  
          an operating part having an initial position in  
which flow of fluid through the pump from the fluid reservoir  
10 to the nozzle is substantially prevented and at least one  
pumping position in which fluid is pumped from the fluid  
reservoir through the nozzle, provided with:

          a resilient element supported by the housing; and  
          an engagement mechanism connected to the resilient  
15 element, which, upon movement of the operating part from the  
initial position, exerts a force opposed to a direction of  
pumping on the operating part through the engagement  
mechanism,

          wherein the housing is configured to receive a  
20 storage holder of which the pump is provided with a nozzle  
forming part of the operating part and at an angle relative to  
the direction of pumping, and wherein the engagement mechanism  
externally engages an area of a portion of the nozzle  
protruding from the operating part upon placement of the  
25 storage holder in the housing.

In accordance with still another aspect of the present invention, there is provided a storage holder configured for placement in a dispenser for the dispensing of fluid and comprising:

30           a fluid reservoir;  
          a pump connected to the fluid reservoir and  
comprising:  
          a nozzle protruding from the pump; and

5b

an operating part having an initial position in which flow of fluid through the pump from the fluid reservoir to the nozzle is substantially prevented and at least one pumping position in which fluid is pumped from the fluid reservoir through the nozzle,

5 wherein the storage holder is provided with a resilient element supported by an exterior of the storage holder and engaging an exterior of the operating part, which resilient element exerts a force opposed to a direction of pumping on the operating part upon movement of the operating part from the initial position.

In accordance with a further aspect of the present invention, there is provided an arrangement for the dosed pumping of a fluid from a fluid reservoir, comprising:

15 a first part with a collar that can be placed around at least a part of a matching neck of a fluid reservoir and is provided with an attachment element on an inside of the first part for, in cooperation with an attachment element on the matching neck, fixing the first part to the matching neck;

20 a piston movable through the first part;

a second part with walls that define a chamber in which the piston can move, the walls including a portion that, upon fixation of the first part onto the matching neck, is clamped between an end of the matching neck in the collar and

25 a stop located in the collar; and

a coupling piece having a neck associated with the second part and configured complementarily to the collar of the first part to secure the first and second parts to one another.

30 The invention will be explained below in further detail, with reference to the accompanying figures.

Figure 1 is a perspective view of an embodiment of the dispenser according to the invention.

5c

Figure 2 shows a cross-section of a pump suitable for use in the invention.

Figure 3 is a side view of an embodiment of the pumping arrangement according to the invention.

5 Figure 4 is a side view of an embodiment of the pumping arrangement according to the invention, which can be used in the dispenser according to the invention.

Figure 5 is a perspective view of the dispenser in folded open condition.

10 Figure 6 illustrates schematically and in simplified manner the principle behind the dispenser according to the invention, in an embodiment wherein a pulling force is exerted on the nozzle by means of a handle.

Figure 7 shows the inside of the handle of the foam dispenser of Figure 1.

15 Figure 8 is a cross-sectional side view of the dispenser of Figure 1.

Figure 9 illustrates schematically and in a simplified manner the principle behind the dispenser according to the invention, in an embodiment in which a pushing force is exerted on the nozzle from the housing.

20 Figure 10 is a side view of a further embodiment of the pumping arrangement according to the invention.

Fig. 1 shows a soap dispenser 1. This comprises a housing, of which a handle 2 forms a part. The housing and the handle 2 are preferably made of plastic such as for example POM, PA or ASA. Possibly the handle 2 can be made of a different plastic from the housing, or have a different colour from the housing.

A window is provided in the handle 2. Through the window, a view is provided of the contents of the reservoir 3, which is filled with liquid soap. Thanks to the window, one can see how full the reservoir 3 still is. An embodiment with a window in the housing is also possible.

Just visible in Fig. 1 is a nozzle 4 of a pump 5. In Fig. 1, one looks down aslant from the front, onto the dispenser 1. Normally, the soap dispenser 1 is attached by its rear side to the wall of, for example, a lavatory space. The user holds one or both hands beneath the nozzle 4 and presses the operating handle 2 with the palms of his hands, whereby a quantity of soap lands on his hand(s) by means of the nozzle 4.

As an aside, it is noted that the invention concerns dispensers for fluid and/or fluid mixtures in general, and is not restricted to soap dispensers. In this respect, it is further noted that also dispensers which dispense a fluid/air mixture, for example in the form of a spray or foam, form part of the invention.

In Fig. 2 a cross-section of a pump 5 is depicted, to illustrate the most important principles and parts of such a pump 5. This specific example contains a foam pump. A characteristic of the pump 5, and in general for pumps used in connection with the invention, is that they are of the type that is also used for hand dispensers in the shape of bottles. Such pumps are cheap and are produced in large quantities. However, they possess a number of disadvantages, which are overcome by the present invention, as will be explained with reference to the example of Fig. 2 below. An essential aspect

of the invention is thus that application of such consumer pumps in dispensers for the industrial market is made possible.

The pump 5 is depicted in a leakage-free initial position in Fig. 2. The pump 5 is actuated by moving an operating part 6 in a downward direction, as depicted in Fig. 2. Foam then leaves the pump 5 through the nozzle 4, which forms an integral part of the part 1. It is pointed out that the nozzle 4 is at an angle relative to the direction of pumping and furthermore protrudes.

Actuation of the operating part 6 leads to actuation of an air ring piston 7, which moves in an air chamber 8, and of a fluid piston 9, which moves through a fluid chamber 10. The fluid chamber 10 is defined by an outer wall 12 of a separate part of the pump 5. Upon movement of the pistons 6,9 air is expelled from the air chamber 8 and fluid from the fluid chamber 10 to a mixing chamber 11, through openings, for example in the shape of grooves (not visible in Fig. 2) in the fluid piston 9, between the air ring piston 7 and fluid piston 9, and a closable opening 13 between the fluid piston 9 and a central sealing element 14, respectively. Via one or more foam forming parts 15, situated between mixing chamber 11 and nozzle 4, foam leaves the mixing chamber 11. The foam forming parts 15 can, for example, be present in the shape of perforated plates or meshes.

When the air ring piston 7 moves up to the initial position, an under pressure arises in the air chamber 8. Valves 16, here in the shape of holes which are covered by membranes, open as a consequence of this under pressure. Air is sucked in from outside, past the operating part 6 which shows some clearance. The air is thus supplied from outside the reservoir 3 through an air supply, closable by the valves 16. Because the air is sucked in from outside, no air supply from the reservoir 3 is necessary.

When the fluid piston 9 moves up to the initial position, an under pressure arises in the fluid chamber 10. Because of this, fluid is sucked from a fluid reservoir 3 connected to the pump 5 via a short suction tube 17. When the pump 5 is used to pump fluid from a reservoir with rigid walls, the fluid volume pump from the reservoir needs to be replaced by air. To this end, one or more aeration holes 18 can be provided in the outer wall 12 of the air chamber 8.

The opening 13 forms a valve which is held closed in a leakage-free initial position. To this end, the pump 5 has a spring 19 which moves the fluid piston 9 upwards and is supported by a stop 20. The stop 20 prevents further upward movement of the central sealing element 14, so that the fluid piston 9 comes to rest against the central sealing element 14 at the opening 14. In this situation, the fluid chamber 10 is closed off from the opening in the nozzle 4 in a leakage-free manner.

Because the pump 5 is designed for consumer applications and for use with hand dispensers, wherein the operating part 6 is actuated by one finger, the spring 19 is designed to be quite weak. Furthermore, the pump 5 is not designed to have a long lifetime. The spring 19 which is used, need not therefor keep its resilient force for a longer time in such applications.

In the embodiment depicted in Fig. 2, the pump 5 comprises a thread 21, applied to the inside of the collar of a cap 22. The collar fits onto a matching bottle neck of a hand soap dispenser. The protruding edge 23 of the outer wall 12 is thereby clamped between the threaded bottle neck and a stop 24 on the inside of the part that comprises the cap 22. This is necessary to keep the pump 5 together. When the pump 5 is not mounted to a threaded neck, the spring 19 presses the part of which the outer wall 12 defines the chamber out of the part that comprises the cap 22. To be able to nevertheless use the

pump 5 in the dispenser 19, use is made of a coupling piece 25, schematically depicted in Fig. 4, to provide a connection to the pump 5. The coupling piece 25 comprises a threaded neck 26, which matches the collar of the cap 22. It is thus

5 possible to use the pump 5 both in soap dispensers according to the invention and in such hand soap dispensers, by which means advantages of scale are consequently achievable in production.

The invention is not limited to variants in which a screw connection fixes the first part comprising the cap 22  
10 onto the neck of a bottle or coupling piece 25. It goes without saying that other means of attachment are possible, as long as the protruding edge 23 is clamped between neck and collar. Thus, it is also possible that the pump 5 is attached by means of a snap or click connection to the coupling piece  
15 25.

Aeration holes 18 in the outer wall 12 can form a problem, if the dispenser is used upside down, that is to say in a state in which the pump 5 lies below the reservoir 3, or is heavily shaken. In that case, the fluid could flow through  
20 the aeration holes 18 into the air chamber 8.

For this reason, the outer wall 12 is preferably at least partly enclosed by the coupling piece 25 according to the invention, in such a manner that the aeration passages are closed off by the coupling piece 25. In this manner, the pump  
25 5 and a fluid reservoir 3 connected to it can be used upside down as well.

In the dispenser according to the invention, the pumping arrangement is connected to a fluid reservoir 3 having a flexible reservoir wall, schematically denoted by reference  
30 number 27 in Fig. 4. The pump 5 is connected to the wall 27 in a substantially airtight manner, as will be explained further below. The wall 27 of the fluid reservoir 3 preferably comes in the shape of a plastic bag.

Good characteristics of the bag are obtained when it is built up out of a laminate. An example of such a laminate is a laminate comprising a layer of PE, a layer of PA and another layer of PE. PE has the advantage that it can be well thermally welded, so that a stopper or plug can be welded into an opening of the bag. PA is a material that forms a good barrier against soap. The said materials are very flexible. It goes without saying that these materials are proposed merely by way of elucidating example. It is not necessary that the flexible wall 27 consist of a laminate. The wall 27 can also be formed by co-extrusion. Another choice of materials is also possible, as long as a good barrier against the contents of the reservoir 3 is provided.

The pump 5 sucks the liquid soap from the reservoir 3 through the short suction tube 17. Thanks to the short suction tube 17, it is also possible to use the storage holder in a dispenser in which the pump 5 lies above the bag, without the bag having to be completely filled upon delivery. The fluid pump of the pump 5 can pump air. It has, however, become apparent that immaculate execution of the first stroke of the pump 5 can be assured by sucking fluid through the suction tube 17. In the pump 5, foam is formed by mixing with air, which is dispensed through the nozzle 4.

An important advantage of the shown arrangement lies in the use of the flexible wall 27 and the airtight connection to the pump 5. Due to the use of the flexible wall 27, no aeration of the reservoir 3 is necessary. As more fluid is pumped out of the reservoir 3, the flexible wall 27 collapses further. No fluid can reach the pump 5 from the reservoir 3 either, other than through the suction tube 17. This is particularly important, because the pump 5 lies lower than the fluid in use.

Fig. 4 also shows how the pump 5 is attached to the flexible wall 27 of the reservoir 3. The wall 27 is thermally

welded to a plug 28 in an opening in the reservoir 3. Bonding is also possible in principle. The pump 5 is connected to the coupling piece 25, with which the storage holder, comprising the reservoir 3, the pump 5, the coupling piece 25 and the plug 28, can also be attached to the housing of the dispenser.

Guidance edges, not shown, can ensure that the parts are positioned at a correct angle around the longitudinal axis depicted by a dashed line, relative to each other. A defined tightening moment can also be adhered to when screwing the pump 5 to the coupling piece 25, to ensure that the pump 5 is aligned correctly relative to the rest of the storage holder and the housing.

In the embodiment shown in Fig. 4, the pump 5 is screwed to the coupling piece 25. This assembly is subsequently pushed tight onto the plug 28. An embodiment, in which the coupling piece 25 is glued to the plug 28 or screwed to it, is also conceivable. In these embodiments guidance means can also be applied to align pump 5, coupling piece 25 and plug 28 at a correct angle relative to each other.

In Fig. 5, a perspective view of the soap dispenser in folded open condition is shown. In this embodiment, in which the storage holder is provided with an enclosing housing 29 with rigid wall, the storage holder is simply placed in a shallow tray, the so called box holder 30. The housing 29 can for example be made from stiff cardboard. This housing 29 facilitates the transport of the reservoir 3 and placement in the housing. An embodiment in which eyes, loops, or a seam with holes are provided on the bag, so that it can be suspended from the rear wall on the inside is however also possible.

Also visible, is that the pump 5 is attached to the housing 2 by means of the coupling piece 25 upon placement of the storage holder. According to the invention, the coupling piece 25 is slid into an adapter 31 and locked in by two latches 32. By these means for securing and positioning the

pump 5, it is, on the one hand, achieved that the pump 5 is rigidly coupled to the housing 2 during use, so that the force exerted on the pump 5 by the user through the handle 2 - which mechanically contacts the operating part 6 of the pump 5 - can be resisted. The latches 32 prevent unintended release during use. On the other hand, the orientation of the pump 5 is thus also determined, so that the nozzle 4 points down and the foam lands there where the user of the dispenser 1 expects it to.

Differently designed combinations of coupling piece 25 and adapter 31 are possible. A different type of locking of the coupling piece 25 is also possible. By using the coupling piece 25, different types of pump 5 can be made suitable for use in one type of housing 2. The coupling piece 25, namely, forms part of the storage holder.

It is visible in Fig. 5, that the housing 2 in fact comprises two parts, namely a carrier 33 and a hinging hood 34. An embodiment, in which the hood 34 can be completely detached, is also one of the possibilities. Such a modular build has the advantage that parts are easily replaceable if they are damaged. Furthermore, different markets can be supplied by, for example, different hoods. The handle 2 can possibly be replaceable, so that the housing 2 is not only suited for the specific pump 5 depicted here.

The housing 2 is provided with a latching arrangement, not shown in further detail in Fig. 5, to hold the hood 34 in position during normal use. When the reservoir 3 is empty, the hood 34 is released and opened and the entire storage holder, including the pump 5, is taken out and replaced by a full one.

When the fluid reservoir lies above the pump 5, as in Fig. 5, an extra large chance of fluid leaking from the pump 5 exists, when the operating part 6 is not properly returned to its leakage-free initial position after the last stroke of the pump. This primarily occurs after a period of prolonged use.

Upon manufacture, the moving parts of the pump 5 are provided with lubricating means, to eliminate the friction. After a period of time, certainly in use in a soap dispenser, the lubrication is lost. The pump 5 will, without further  
5 measures, start to run more brusquely. The spring 19, visible in Fig. 2, by itself delivers insufficient force for returning the operating part 6, the fluid piston 9 and the air ring piston 7 back to the initial position, in which the opening 13 is closed off.

10 The invention resolves this problem and prolongs the lifetime of the pump 5, by making use of resilient means which are supported by the housing and of an engagement mechanism which engages the operating part 6. The resilient means exert a force opposed to the direction of pumping on the operating  
15 part 6 upon actuation of the operating part 6 from an initial position. Thus, use is made of external resilient means to support the operation of the internal spring 19, or even to make the internal spring 19 superfluous. In the latter case, a variant of the pump 5 is used, in which the operating part 6  
20 directly opens and closes the valve formed by opening 13.

The invention provides the advantage of a modular system, in which the housing forms one module and the storage holder and/or the pump 5 the other module. The most complicated module, that is to say the pump 5 is, however,  
25 completely standard and thus relatively cheap. Only the housing is adapted, by providing it with resilient means and an engagement mechanism that externally engages a part of the nozzle 4.

In Fig. 6, the principle of the invention is  
30 explained further in a schematic manner. The handle 2 of the dispenser is hingingly attached to the hood 34. The pump 5 is rigidly connected to a housing part 35. The engagement mechanism is exclusively formed by the handle 2, in the sense that the handle 2 is provided with an opening 36, through which

the nozzle 4 of the pump 5 sticks. Pumping is thus performed by exerting a pushing force on the handle 2, which is transferred to the operating part 6 by the handle 2. After pumping, the spring exerts a pulling force on the nozzle 4 by means of the handle 2, by means of which the operating part 6 is moved back to the leakage-free initial position. Note that the invention makes use of a minimum in parts.

In Figs. 7 and 8, the constructive implementation for the example of the dispenser 1 of Fig. 1 is depicted. In Fig. 7, the operating handle 2 is shown in perspective, seen from behind. After placement of the storage holder in the housing 2, the nozzle 4 will, upon closing the hood 34, stick through the opening 36 and be enclamped and aligned by ribs 37, which, for a better functioning can possibly taper from above to below. Lopsidedness of the nozzle 4 is hereby corrected.

At its rear side, the opening 36 also has an edge 38. By this edge 38, it is ensured that the operating part 6 of the pump 5 is returned back to its initial position after actuation. When the handle 2 is returned to the initial position, the edge 38 will make contact with an area of engagement denoted by reference number 39 in Fig. 7, of a protruding part of the nozzle 4, which is thus entrained in a direction opposed to the direction of actuation of the pump 5. The edge 38 of the handle 2 thus causes the handle 2 to function as a sort of carrier.

Resilient means are attached to points of suspension 40 of the handle 2, which ensure an automatic rebounding of the handle 2 after a stroke of the pump. In Fig. 8, such a resilient element 41 is shown, which can, for example, exist of a bent strip of metal or elastic plastic forming a spring blade. The resilient element 41 is attached to the point of suspension 40 at one end, for example by means of a screw. When the hood 34 is closed, the resilient element 41 is under

tension, because the other end contacts a supporting area 42 of the box holder 30.

By means of a different choice of material or design of the resilient element 41, or by placing the point of suspension 40 or the supporting area 42 elsewhere, the maximum stroke and/or the maximum force transferable to the operating part 6 is set differently. The same effect is attainable by moving the point of engagement of the handle 2 with the pump 5, for example by using a different adapter 31 or a different coupling piece 25. Here again, the special advantage of the modular build of the foam dispenser 1 according to the invention becomes apparent. With a number of modules, a multitudes of embodiments can be provided, which are each specifically adapted to a certain use.

In Fig. 8, it can also be seen how the resilient force of the resilient element 41 is transferred to the nozzle 4, which, as mentioned, forms an integral part of the operating part 6, by means of the edge 38.

Fig. 9 schematically shows a second variant of the dispenser according to the invention. Only the aspects which are of importance for illustration of the engagement mechanism and the resilient means which return the operating part to its leakage-free initial position are shown. This variant differs from the variant shown in Fig. 6, as the engagement mechanism is not formed by the handle 19. Instead, the dispenser, more particularly the housing of the dispenser, is provided by a compression spring 43, which is supported at one end by a swivelling arm 44, and at the other end by a housing part 45. So, there where in Fig. 6, a pulling force is exerted on the nozzle 4, a pushing force is exerted from the housing on the nozzle 4 the variant shown in Fig. 9.

In the embodiment illustrated in Fig. 9, the pump 5 is rigidly connected to the housing part 45, for example by means of the coupling piece 25 with matching adapter 31

described above. Such an embodiment has the advantage that the storage holder with pump 5 is easily placeable in the housing. One simply lowers the pump 5 into the housing from above, whereby the swivelling arm 44 quasi-automatically hooks behind the nozzle 4. After placement of the storage holder and closing of the hood 22, the dispenser is ready for use.

A further variant of the invention is schematically shown in Fig. 10. This variant is based on the same central idea of making use of an external spring and a simple engagement mechanism. In this variant, the storage holder is provided with a spring 64 which is supported by the exterior of the operating part 6. The spring 46 is also supported here by the nozzle 4, as shown in Fig. 10. Here also, the resilient means exert a force on the operating part 6 opposed to the direction of pumping, upon movement of the operating part 6 from the leakage-free initial position. As can be seen in Fig. 10, the spring 46 is supported by the coupling piece 25. This has the advantage that coupling piece 25 and pump 5, together with spring 46, form a unit. The unit can be stuck on the fluid reservoir 3 as is, regardless of what type of fluid reservoir 3 is used. In the variant of Fig. 10, the engagement mechanism also consists of one single part 47 that has a form suitable for transferring the force of the spring 46 to the nozzle 4.

It will be apparent that the embodiment described above has been given purely by way of example and can vary within the scope of the claims. Thus, it is possible to apply the pumping arrangement with the coupling piece in dispensers without resilient means and engagement mechanism to return the operating part of the pump to the leakage-free initial position and vice versa.

CLAIMS:

1. A dispenser for the dispensing of a fluid,  
comprising:  
5 a housing;  
a fluid reservoir placed in the housing;  
a pump connected to the fluid reservoir, the  
pump having: a nozzle protruding therefrom;  
an operating part having an initial position  
10 and at least one pumping position in which fluid is  
pumped from the fluid reservoir to the nozzle; and  
a piston that moves with the operating part in  
substantially the same direction as the operating part,  
the piston positionable in an opening when the operating  
15 part is in the initial position to substantially prevent  
flow of fluid through the pump to the nozzle;  
a resilient element supported by the housing;  
and  
an engagement mechanism connected to the  
20 resilient element, which, upon movement of the operating  
part from the initial position, exerts a force opposed to  
a direction of pumping on the operating part through the  
engagement mechanism,  
wherein the nozzle forms part of the operating  
25 part and is at an angle relative to the direction of  
pumping, and wherein the engagement mechanism externally  
engages an area of a part of the nozzle protruding from  
the operating part.
2. The dispenser according to claim 1,  
30 wherein the pump and the fluid reservoir are removably  
housed in the housing.

3. The dispenser according to claim 2,  
wherein the engagement mechanism is part of the housing.

4. The dispenser according to any one of  
5 claims 1 to 3, wherein the housing is provided with a  
handle mechanically contacting the operating part, such  
that, upon actuation of the handle, the operating part is  
moved in the direction of pumping.

10 5. The dispenser according to claim 4,  
wherein the engagement mechanism is formed by the handle.

6. The dispenser according to claim 5,  
wherein the handle is provided with an opening through  
15 which the nozzle protrudes, such that an edge of the  
opening engages an area of a portion of the nozzle  
protruding from the operating part.

7. The dispenser according to any one of  
20 claims 1 to 6, wherein the resilient element comprises at  
least one compression spring.

8. The dispenser according to any one of  
claims 1 to 7, wherein the resilient element comprises  
25 one or more bent leaf springs.

9. The dispenser according to any one of  
claims 1 to 8, wherein the resilient element is in a  
pretension state in the initial position of the operating  
30 part.

10. The dispenser according to any one of claims 4 to 9, wherein the handle is suspended in a hinging manner in the housing.

5 11. A housing for a dispenser for the dispensing of a fluid, configured to receive a removable storage holder of the type comprising:

a fluid reservoir; and

10 a pump connected to the fluid reservoir and including: a nozzle protruding therefrom; and an operating part having an initial position in which flow of fluid through the pump from the fluid reservoir to the nozzle is substantially prevented and at least one pumping position in which fluid is pumped from  
15 the fluid reservoir through the nozzle, provided with:  
a resilient element supported by the housing;

and

an engagement mechanism connected to the resilient element, which, upon movement of the operating  
20 part from the initial position, exerts a force opposed to a direction of pumping on the operating part through the engagement mechanism,

wherein the housing is configured to receive a storage holder of which the pump is provided with a  
25 nozzle forming part of the operating part and at an angle relative to the direction of pumping, and wherein the engagement mechanism externally engages an area of a portion of the nozzle protruding from the operating part upon placement of the storage holder in the housing.

12. A storage holder configured for placement in a dispenser for the dispensing of fluid and comprising:

5 a fluid reservoir;  
a pump connected to the fluid reservoir and comprising:  
a nozzle protruding from the pump; and  
an operating part having an initial position in which flow of fluid through the pump from the fluid  
10 reservoir to the nozzle is substantially prevented and at least one pumping position in which fluid is pumped from the fluid reservoir through the nozzle,  
wherein the storage holder is provided with a resilient element supported by an exterior of the storage  
15 holder and engaging an exterior of the operating part, which resilient element exerts a force opposed to a direction of pumping on the operating part upon movement of the operating part from the initial position.

20 13. The storage holder according to claim 12, further comprising: a coupling piece with which the storage holder can be fixed in the dispenser and by which the resilient element is supported.

25 14. An arrangement for the dosed pumping of a fluid from a fluid reservoir, comprising:  
a first part with a collar that can be placed around at least a part of a matching neck of a fluid reservoir and is provided with an attachment element on  
30 an inside of the first part for, in cooperation with an attachment element on the matching neck, fixing the first part to the matching neck;

a piston movable through the first part;  
a second part with walls that define a chamber  
in which the piston can move, the walls including a  
portion that, upon fixation of the first part onto the  
5 matching neck, is clamped between an end of the matching  
neck in the collar and a stop located in the collar; and  
a coupling piece having a neck associated with  
the second part and configured complementarily to the  
collar of the first part to secure the first and second  
10 parts to one another.

15. The arrangement according to claim 14,  
wherein the coupling piece comprises a threaded neck and  
the first part comprises a matching thread provided on  
15 the inside of the collar thereof.

16. The arrangement according to claim 14,  
wherein the coupling piece is provided with one or more  
fixing and positioning elements for fixing and  
20 positioning the arrangement in an adapter in a housing of  
a dispenser.

17. The arrangement according to claim 16,  
wherein the coupling piece is provided with one or more  
25 fixing and positioning elements for fixing and  
positioning the arrangement in the adapter in the housing  
of the dispenser.

18. The arrangement according to any one of  
30 claims 14 to 17, wherein one or more aeration passages  
have been provided in a wall of the second part, and  
wherein the wall of the second part is at least partly

enclosed by the coupling piece such that the aeration passages are closed off by the coupling piece.

19. The arrangement according to any one of  
5 claims 14 to 18, further comprising:

an operating part that operates one valve in fluid passage and is movable in the first part from a substantially leakage-free initial position, when the valve is held closed, in a direction of pumping, with  
10 which movement fluid is pumped from an attached fluid reservoir, wherein the arrangement is provided with a resilient element which is supported by an exterior of the coupling piece and engages an exterior of the operating part, which resilient element, upon movement of  
15 the operating part from the substantially leakage-free initial position, exerts a force opposed to a direction of pumping on the operating part.

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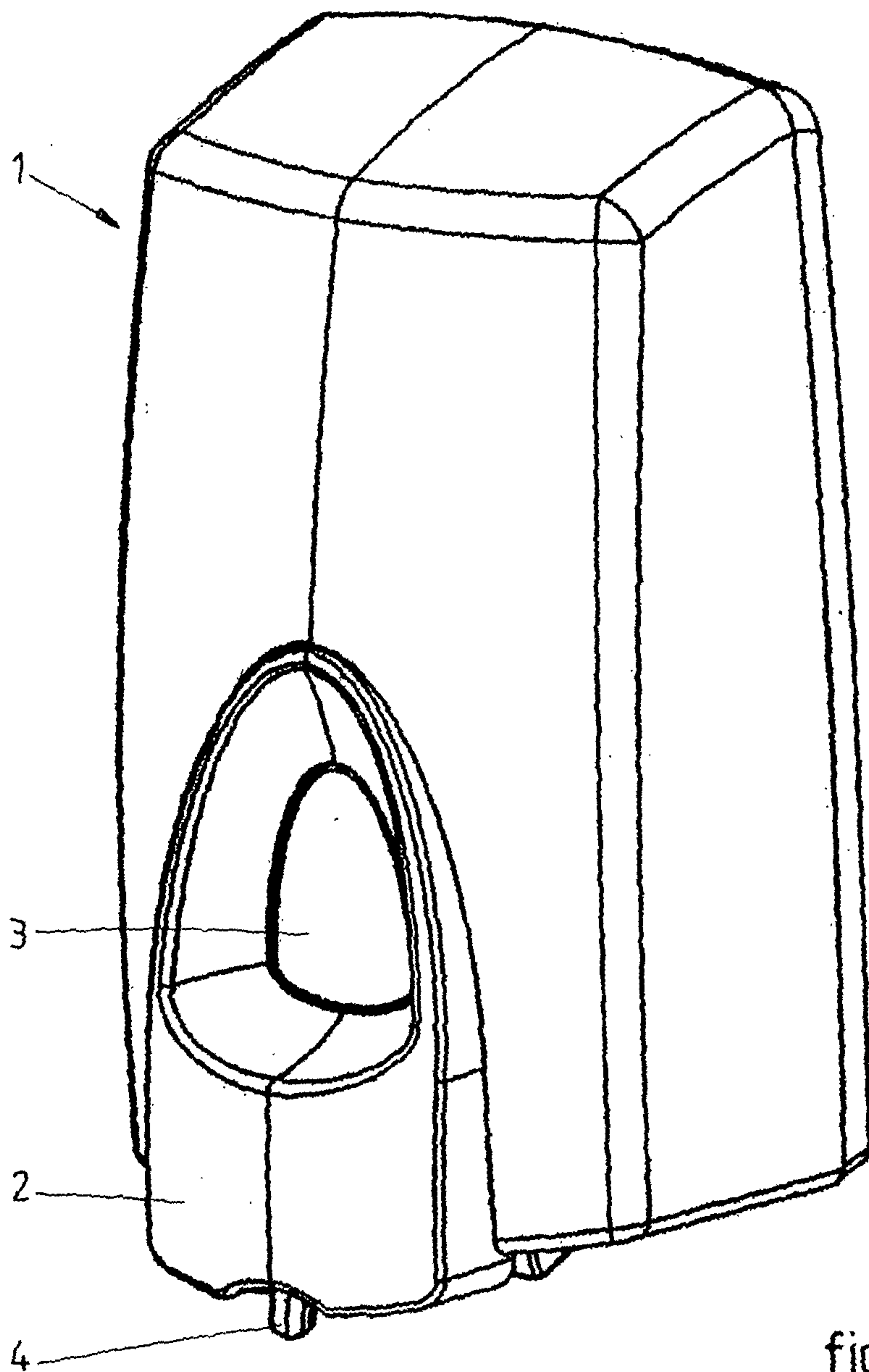
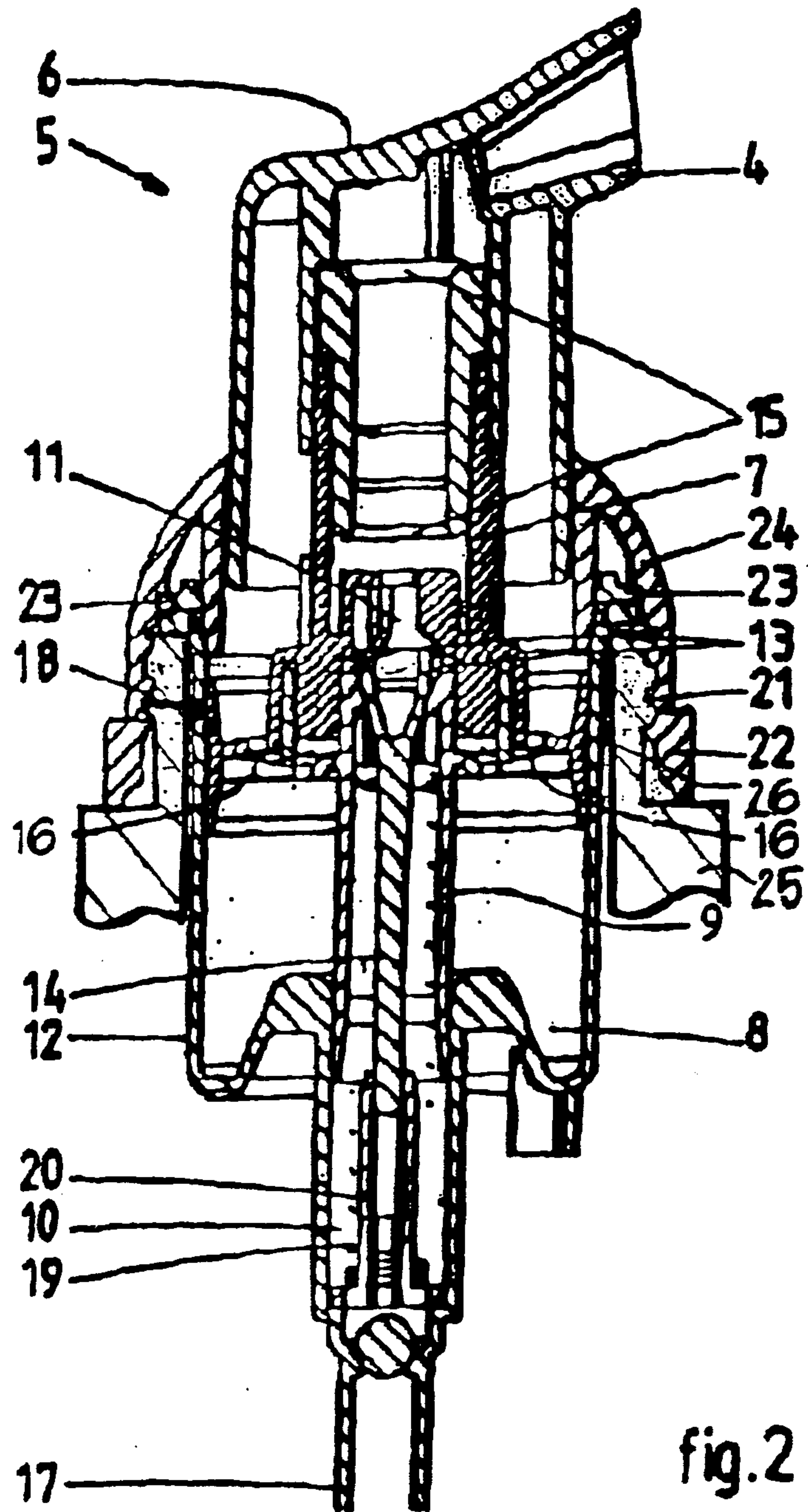


fig.1

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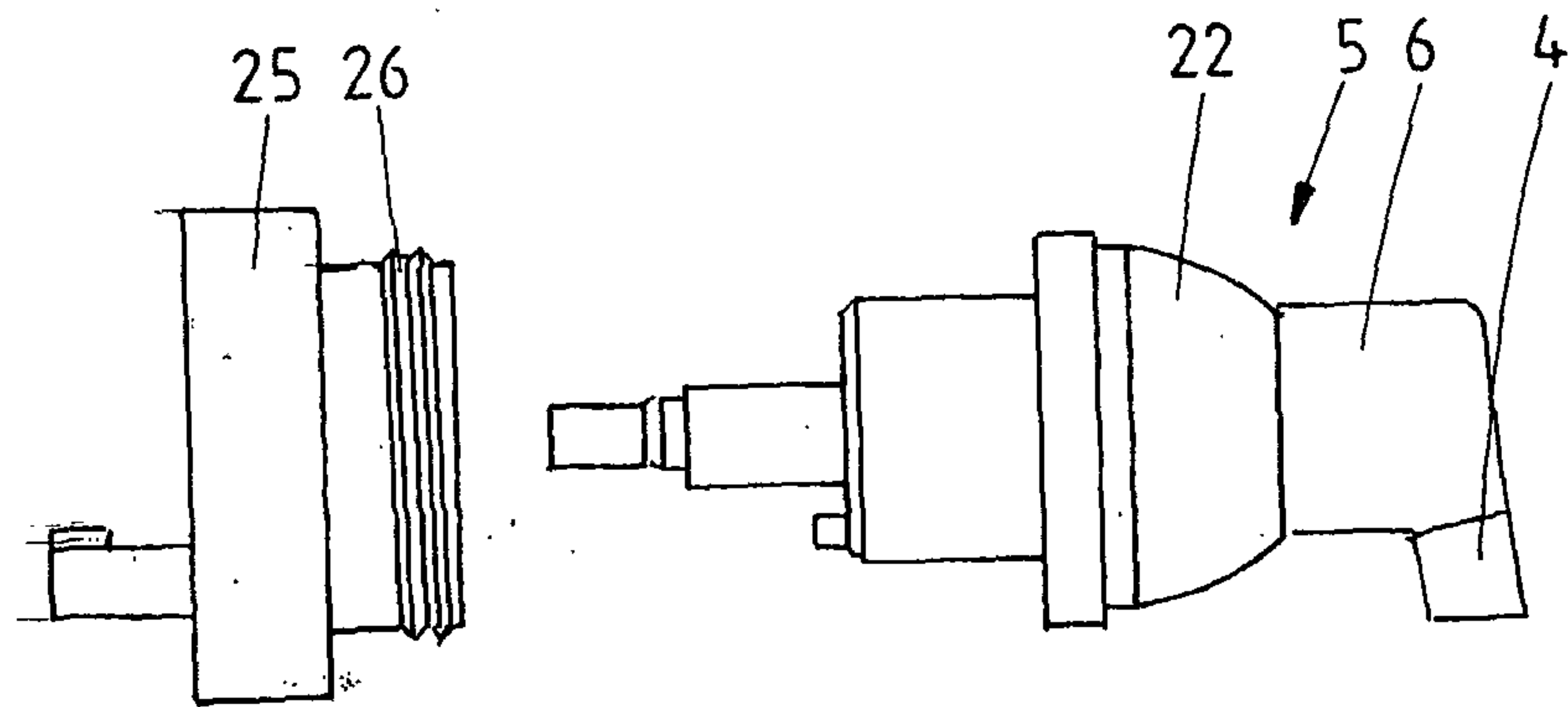


fig 3

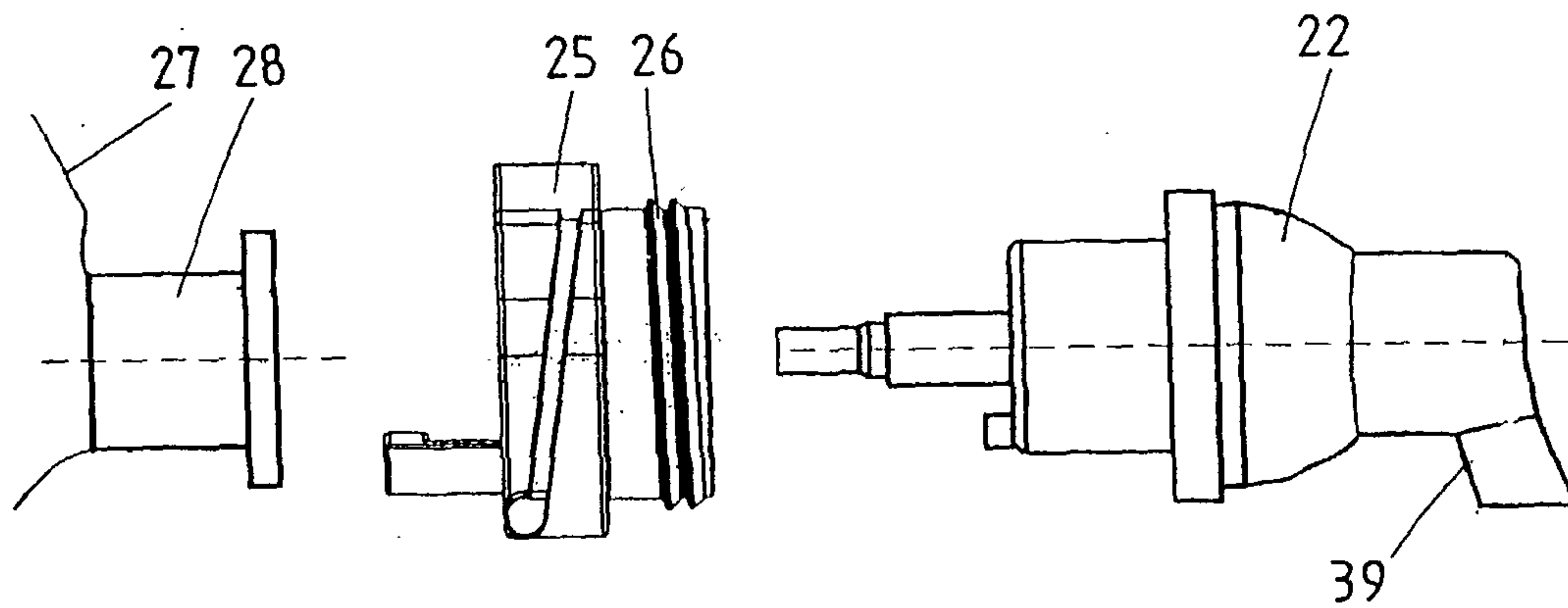
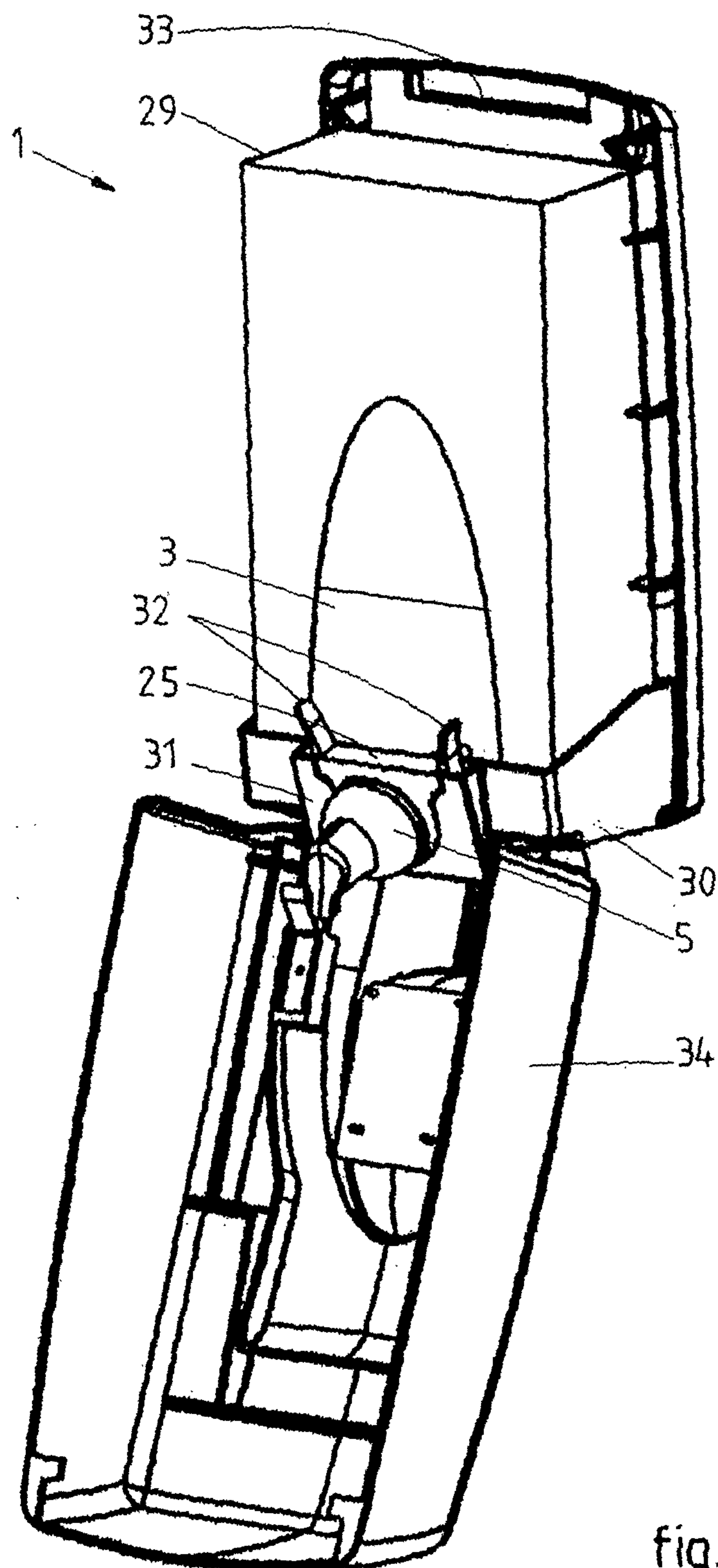
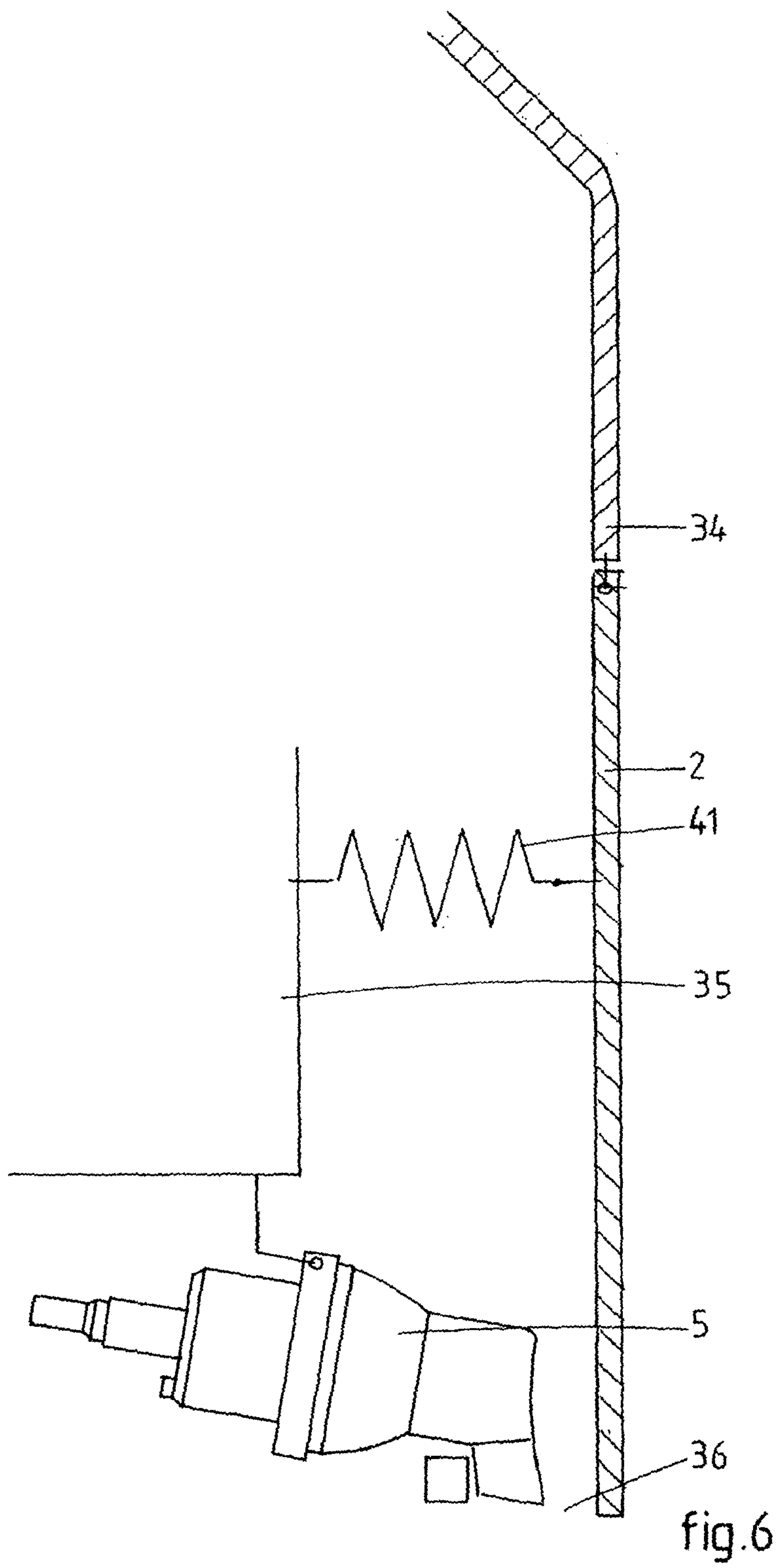


fig.4

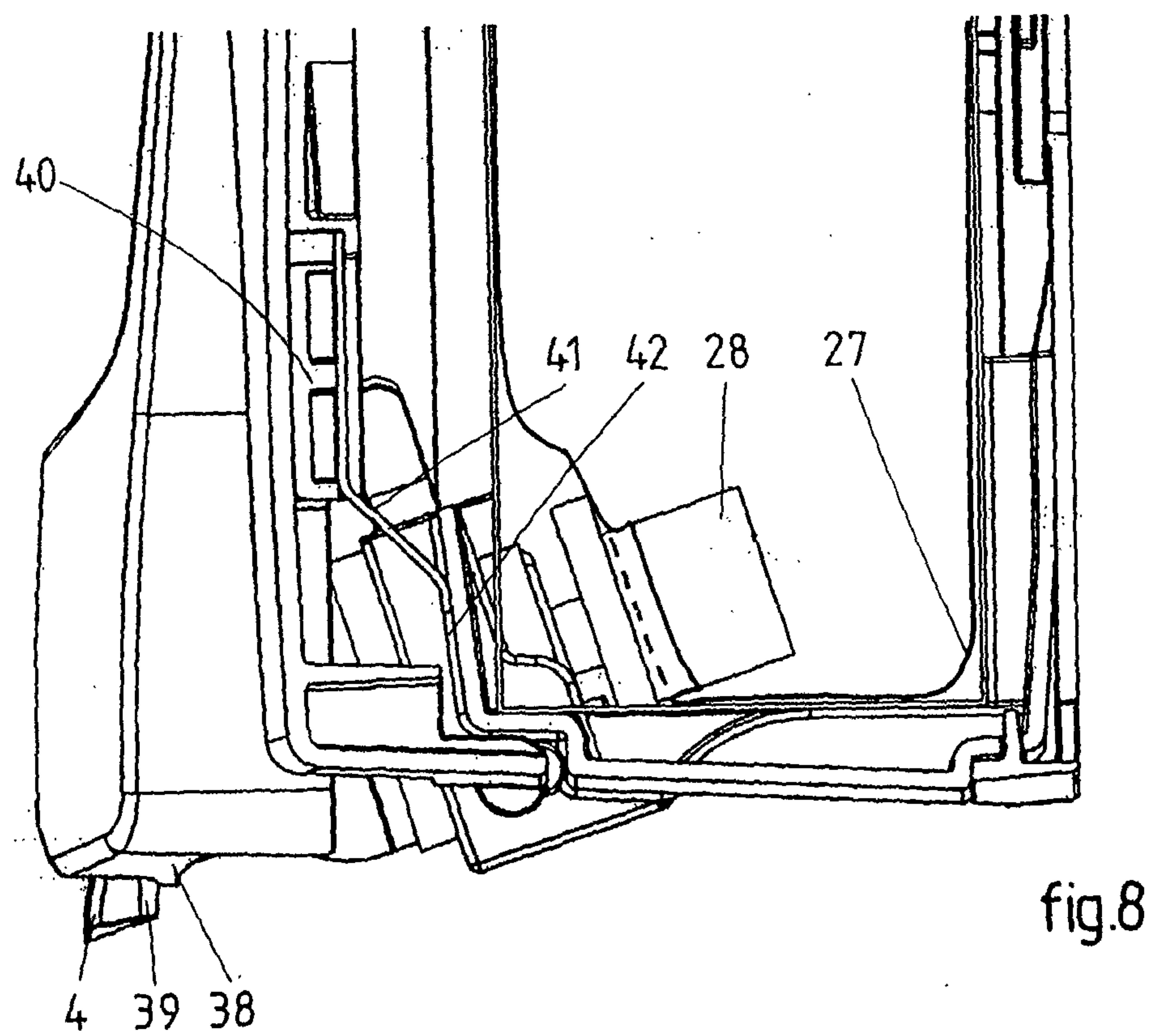
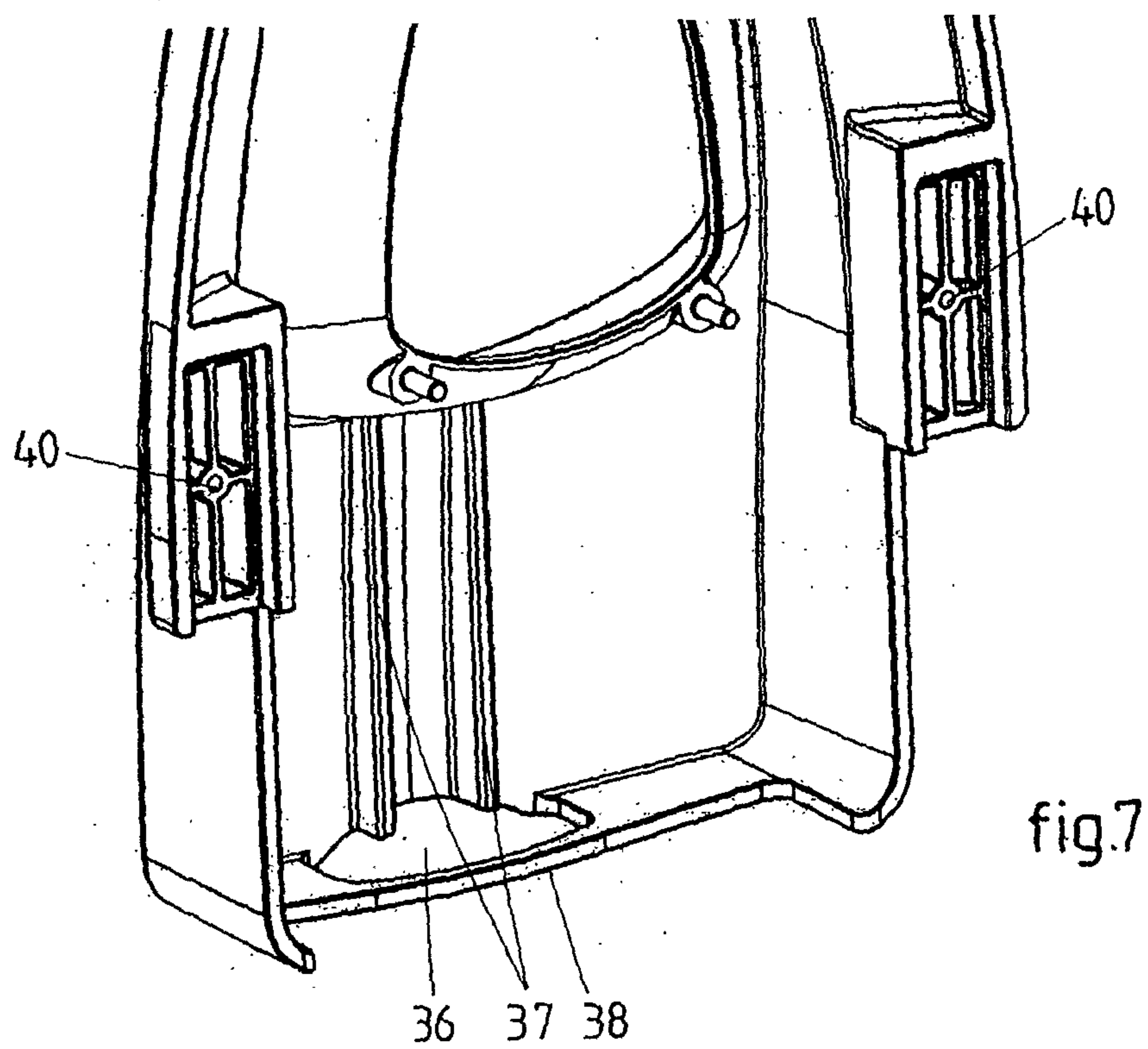
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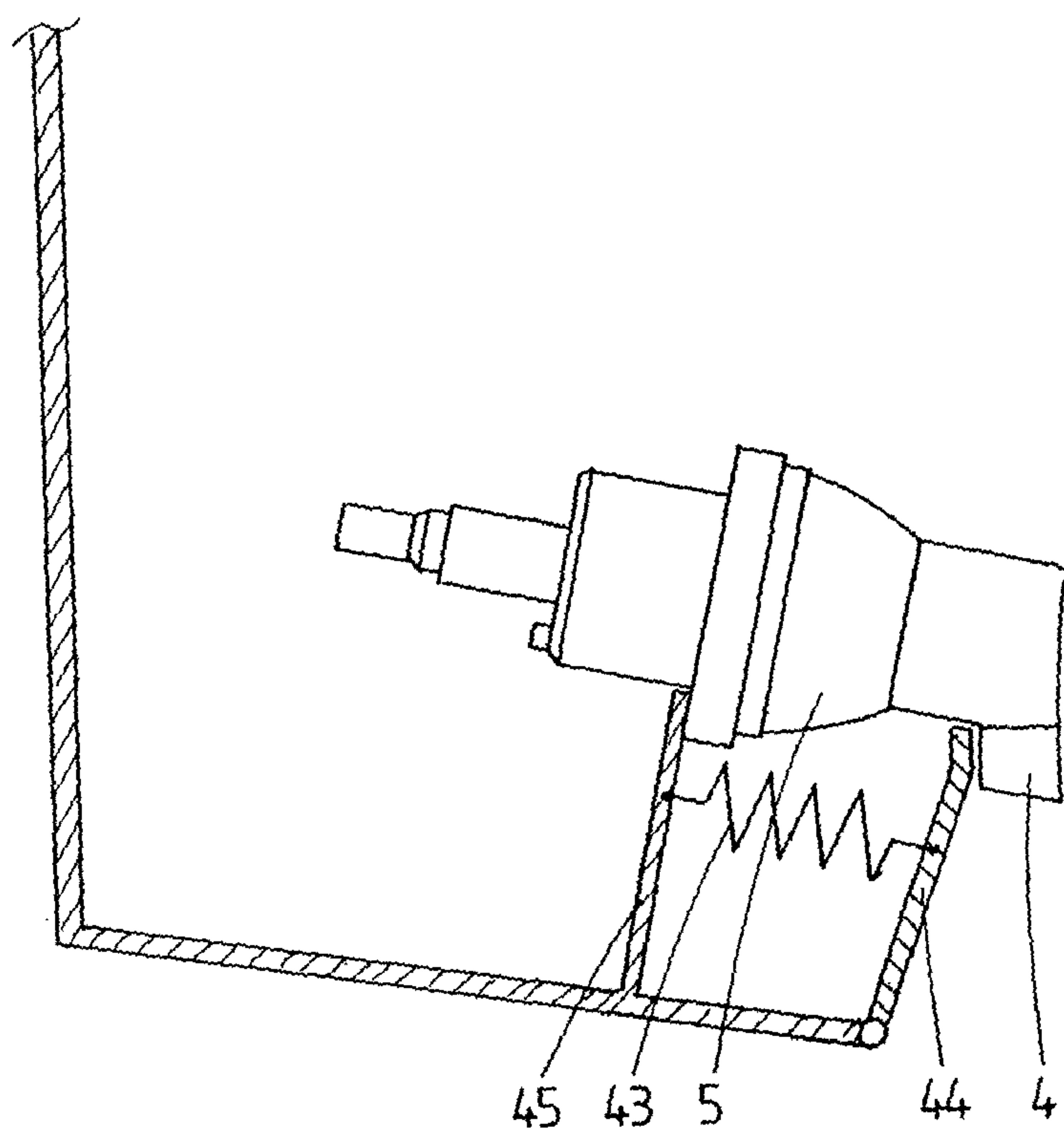


fig.9

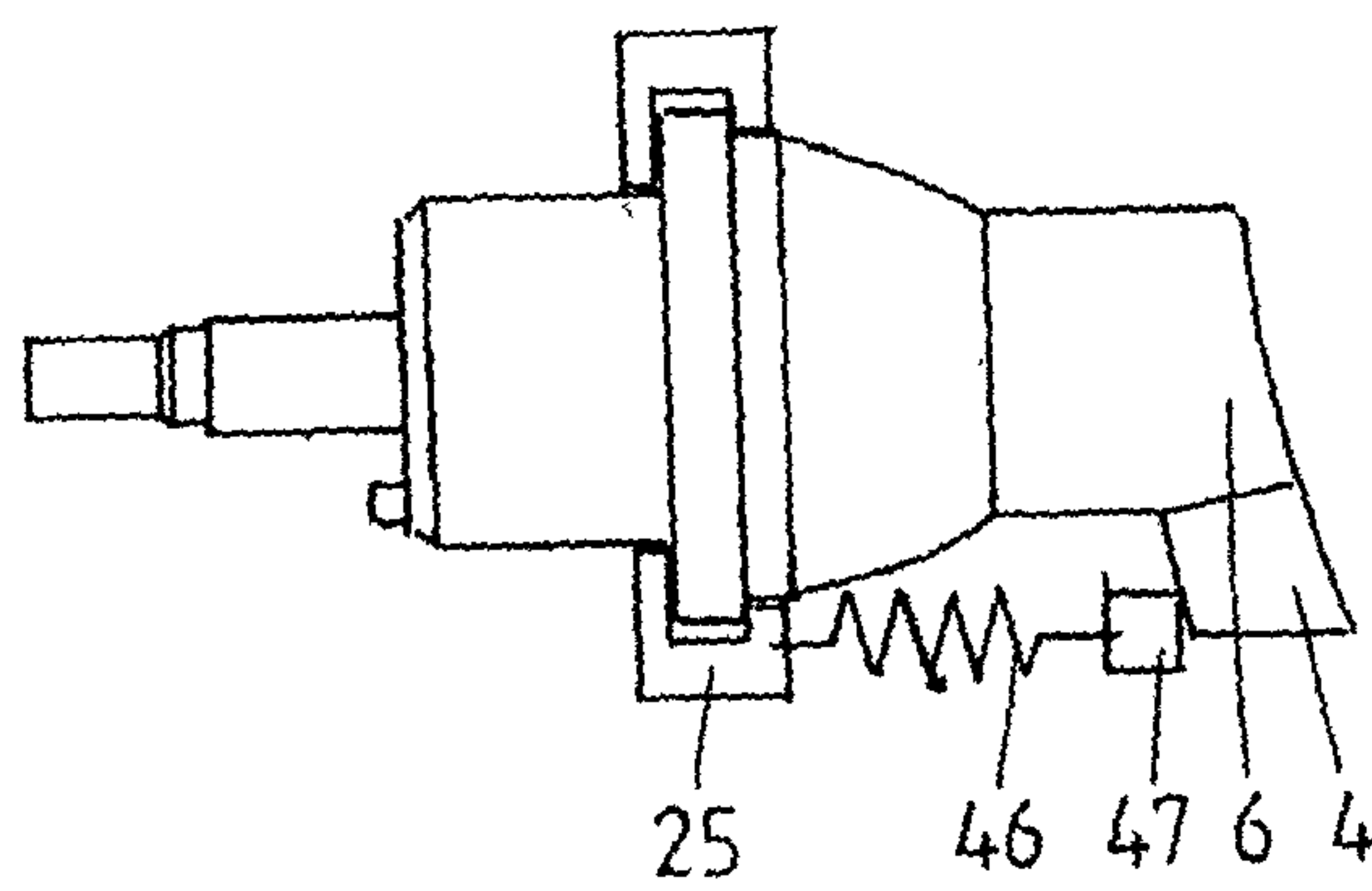


fig.10

