(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 046 754**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **28.01.87**

(51) Int. Cl.[4]: **B 67 B 7/86**

(21) Application number: **80901986.2**

(22) Date of filing: **20.03.80**

(86) International application number:
PCT/US80/00296

(87) International publication number:
WO 81/02418 03.09.81 Gazette 81/21

(54) **COMBINED PIERCER AND VALVE FOR FLEXIBLE BAG.**

(30) Priority: **27.02.80 US 124971**

(43) Date of publication of application:
10.03.82 Bulletin 82/10

(45) Publication of the grant of the patent:
28.01.87 Bulletin 87/05

(84) Designated Contracting States:
AT CH DE FR GB NL SE

(56) References cited:
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EP 0 046 754 B1

Courier Press, Leamington Spa, England.

Description

Field of the Invention

The present invention concerns a valve for a flexible pouch or bag comprising a flange secured to the outer surface of said bag, a valve body essentially constituted by a cylindrical portion and a movable piercer unit mounted in said valve body and provided with at least one cutting edge on its inner end, said piercer unit being essentially constituted by a shaft that is movable perpendicularly to the outer surface of the pouch or bag and bearing a valve element cooperating with a seat disposed in said cylindrical portion.

Description of the Prior Art

Such a valve is known from U.S. Patent 3 930 286 which discloses a valve for a flexible bag or pouch comprising a flange secured to the outer surface of the pouch, a valve body essentially constituted of a cylindrical portion and a movable piercer unit. The valve body is not integral with the flange or sealing ring but slipped over the latter. This disposition has the drawback that, when the piercer unit has opened the bag, the valve may break away from its slipping attachment to the sealing ring due for instance to an overpressure that can be caused when handling the bag. In that case, the liquid contained in the bag will be lost.

The valve element supported by the piercing unit is disposed outside the cylindrical portion. The seat of this cylindrical portion is constituted by its outer end. As a result, when the bag is opened by the piercer unit, the valve element must be maintained towards the bag for closing it; for dispensing the liquid contained in the bag, the handle 51 of the piercing unit must be pulled out. This disposition has the drawback that it presents no security and that an overpressure in the bag may push out the plunger so that the liquid contained will flow out and be lost.

U.S. Patent 1 763 924 discloses a piercer unit for bottles provided with crown caps made of metal. This piercer unit also constitutes a valve for the bottle provided with such piercer unit. This piercer unit is not integral with the bottle but only fitted over the cap of the bottle. This has the drawback that if there is an overpressure in the bottle, the piercer unit will be ejected and since it also constitutes the valve of the bottle when the crown cap of the bottle has been cut, the liquid contained in the bottle will flow out and be lost.

The present invention overcomes the above drawbacks and its object is a valve that presents a very good security against an inadvertant opening of the valve when the bag is opened.

According to the invention, the valve body is integral with the flange, the valve element is disposed on the shaft in the cylindrical portion and the outer end of said piercing shaft is provided with a manually compressible cap, which is unactuated position urges the valve element against the seat.

Brief Description of the Drawings

Figure 1 is a perspective view showing one form of the valve attached to a portion of a plastic bag that is adapted to hold the material to be dispensed.

Figure 2 is a perspective view showing the device being used for drawing liquid.

Figure 3 is an exploded perspective view of the valve with parts separated for clarity of illustration.

Figure 4 is a bottom view of the valve.

Figure 5 is a sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a view similar to Figure 5 but showing the device in puncturing position.

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Description of the Preferred Embodiment

Referring in detail to the drawings, the numeral 40 indicates the valve of the present invention which is adapted to be used with a flexible film bag or pouch 41 that contains fluidic material or the like to be dispensed. As shown in Figure 5 for example, the valve 40 includes a valve body 42 that includes a first inner flange 43 that is secured in any suitable manner to the outer surface of the pouch 41. The valve body 42 further includes a second flange 44 that is spaced outwardly from the flange 43 so as to define a space 45 between the flanges 44 and 43 for receiving an end portion 46 of a corrugated box or the like 47. The valve body 42 further includes a cylindrical portion 48 that has a third or outer flange 49 adjacent at its outer end, and the flange 49 is provided with a plurality of radially disposed slits 50 therein for a purpose to be later described. The valve body 42 further includes an outwardly projecting portion 52 that has a plurality of spaced apart slots or grooves 51 therein that communicate with the slits 50.

Arranged on the interior of the valve body 42 is a valve seat 54 that is formed on the inner portion of the cylindrical portion 48 of the valve body 42, and the valve seat 54 includes a central opening 55. As shown in Figure 7 for example, the valve seat 54 has a plurality of rings or concentric ridges 56 thereon. The valve seat 54 is arranged on the interior of the cylindrical portion 48 of the valve body 42. There is provided on the outer end portion of the valve body 42 a wall portion 57 which has a central opening 58 therein.

The numeral 59 indicates a piercer shaft unit that includes a shaft portion 60 that has a valve element 61 thereon that is mounted for movement into and out of opened and closed relation with respect to the valve seat 54. A snap through fitting or bushing 62 on the outer end of the shaft portion 60 is engaged by the resilient cap 53.

The inner end of the piercer 59 includes a double point cutting edge 63 on a cylindrical section 64, and the cylindrical section 64 has a plurality of longitudinally disposed grooves 65 in

its outer surface, Figure 7. The numeral 66 indicates a space or hollow interior in the valve body so that when the parts are in the position of Figure 7, the film 41 is punctured whereby the fluidic material can flow from the bag or pouch 41 through the grooves 65, into the space 66, through the oopened valve seat opening 55, into the space 67, and then out through the discharge spout 68 in the bottom of the device. Figure 2 shows the user's thumb being used to apply manual pressure to the deformable cap 53 to cause the cutting edges 63 to puncture the film whereby the material can be discharged into a waiting receptacle 70 or other desired location.

From the foregoing, it will be seen that there has been provided a valve assembly for use in dispensing controlled quantities of matérial from a pouch such as the flexible pouch 41. The material being dispensed may be wine or the like and it is to be understood that the present invention is not limited to any particular type of material to be dispensed. In use, with the parts arranged as shown in the drawings, the valve body 42 is arranged so that its flange 43 is suitably secured in any suitable manner to the outer surface of the film or pouch 41. Initially the parts are in a position such as that shown in Figure 1 or as shown in Figure 5. When it is desired to dispense a quantity of material from the pouch 41, it is only necessary to apply finger or thumb pressure by means of the thumb 69 to the flexible cap 53 so that the parts will move from a position such as that shown in Figures 1 and 5 to a position such as that shown in Figures 2 and 7. Thus, as manual pressure is applied to the cap 53, the piercer shaft element 59 will be moved or pushed inwardly whereby the double cutting edges or points 63 will puncture or pierce the film 41. Thus, material within the pouch 41 can flow through the punctured opening 71 that is formed in the pouch, and this material can then flow through the grooves 65 into the space 66. It will be noted that with the parts in the inward position of Figures 2 and 7, the valve element 61 is moved away from the valve seat 54 so that the material can flow from the space 66 through the valve seat opening 55 and into the chamber 67. The material can then flow by gravity down through the discharge opening or spout 68 into a waiting receptacle 70 or other area.

When manual pressure is released on the cap 53, due to the inherent resiliency of the cap 53, the parts will be automatically returned from the position shown in Figures 2 and 7 to a position such as that shown in Figures 1 and 5 so that the further flow of material will be blocked or prevented. Thus, with the parts in the position shown in Figure 5, the valve element 61 is in closing relation with respect to the valve seat 54 so that no further material will be discharged or dispensed from the pouch.

The parts can be made of any suitable material and in different shapes or sizes as desired or required.

As shown in the drawings, the piercer 59 has the shaft 60 formed integral therewith. However, in certain instances the shaft may be made as a separate piece from the piercer and then these parts can be suitably secured together. Likewise, instead of making the piercer with a double cutting edge, it may be made with a single sharp cutting edge or the like.

As shown in the drawings, the shaft 60 goes outside the cap 53 to prevent the cap from being pulled off. The slits 50 are provided for air flow to and from the cap 53 so that suitable provision is made for vacuum pressure. prevention and the like. The valve seat 54 has the plurality of concentric rings or ridges 56 to help assure a tight seal between the valve element 61 and the valve seat. The cap 53 has a suitable construction to accommodate the snap through section of the shaft 62. The flange 43 may be heat sealed or otherwise secured to the outer surface of the pouch 41. In some instances, the device may be made with a fitment that is a separate piece from the valve body. The slots 51 register with the slits 50 so that sufficient air can enter the interior of the device in order to prevent vacuum formation from occurring. The present invention is especially suitable for use as a wine tap, but it is to be understood that the device can be used for controlling the dispensing of any material and is not limited to the use of wine.

The space 45 between the flanges 43 and 44 can snugly receive therein a portion of a cardboard box or the like in which the pouch 41 is arranged. A suitable protective closure can be arranged over the valve assembly to prevent accidental actuation of the device during shipment, storage and the like. The piercer 59 has on its inner end one or more sharp points or barbs 63 for selectively puncturing the bag or pouch 41. The cap 53 has a dome shape and is made of a suitable resilient material. The barbs 63 are adapted to selectively pierce or puncture the film 41 when the cap 53 is manually depressed by the thumb 69. When the parts are in the position shown in Figure 2 or Figure 7, the liquid or fluid can be dispensed in the desired and proper manner.

It will therefore be seen that there has been provided a valve or tap which is especially suitable for use in dispensing fluidic material or liquid from a flexible bag such as a bag of the type that is arranged in a cardboard box or the like. The valve is especially suitable for use in conjunction with such bags when wine is arranged in such bags, but as previously noted the present arrangement is not limited to any particular material and can be used wherever such materials are to be dispensed. With regard to wine bags, studies have shown that approximately one-third to one-half of the oxygen uptake of the wine occurs through the valve as a consequence of piercing the membrane of the pouch to admit the valve mechanism, and the packaging system and valve of the present invention precludes the permeation of oxygen through the valve.

When manual pressure is applied to the cap 53,

the cap 53 is depressed or compressed, and the piercer shaft is moved so that the sharp edges 63 will puncture the film to provide an opening 71 so that wine or other liquid can then flow out by gravity through the puncture opening 71. When manual pressure is released on the cap 53, due to the inherent resiliency of the cap 53, the parts will automatically return from a position such as that shown in Figure 7 to a position such as that shown in Figure 5 whereby the valve element 61 will seal against the valve seat 54 to prevent any further flow of material through the valve until the valve is again actuated.

Presently, the wine industry is using bags with fittings thereon, and the prior such devices have certain important disadvantages that the present invention overcomes. In particular, with the present invention, oxidation of the contents of the bag is prevented or minimized, and this is due to the fact that the fitment is fixed to the outer surface of the film, and in addition the bag is not punctured until the wine or other liquid is to be dispensed.

An important advantage of this valve device is that the film is not pierced until the valve is put in use, and this is especially important in wine packaging where oxidation is a problem. Also, with the present invention, ease of operation is assured as well as oxygen permeability is properly handled. With the present invention, automatic assembly is readily accomplished, and the device can be efficiently oriented as when the entire tap assembly is made in an automatic feeder.

With the present invention, the integrity of the pouch is not lost and the valve will not leak and destroy the package so that air cannot enter and degrade the product. Thus, improved shelf life is provided as compared to pouches that are used with valves that require the pouch to be broken. Thus, a cleaner, tighter pouch with longer shelf life is provided since the flange 43 is affixed to the outer surface of the film 41.

It will be seen that there has been provided a valve or tap which is especially suitable for dispensing liquids such as wine from a pouch. The pouch 41 is adapted to be arranged in a collapsible cardboard carton, and such carton may include decorative material on its outer surface. The pouch 41 may be made of any suitable material such as transparent flexible plastic, foil or the like.

Claims

1. Valve (40) for a flexible pouch or bag (41) comprising a flange (43) secured to the outer surface of said outer bag, a valve body (42) essentially constituted by a cylindrical portion (48) and a movable piercer unit (59) mounted in said valve body (42) and provided with at least one cutting edge (63) on its inner end, said piercer unit (59) being essentially constituted by a shaft (60) that is movable perpendicularly to the outer surface of the pouch or bag and bearing a valve element (61) cooperating with a seat (54) disposed in said cylindrical portion (48), characterized in that the valve body (42) is integral with the flange (43), that the valve element (61) is disposed on the shaft (60) in the cylindrical portion (48) and in that the outer end of said piercing shaft (60) is provided with a manually compressible cap (53), which in unactuated position urges the valve element (61) against the seat (54).

2. Valve according to claim 1, characterized in that the valve body (42) further includes a second flange (44) that is spaced outwardly from the flange (43) so as to define a space (45) between said flange (43) and said second flange (44) for receiving an end portion of a closure or aperture in corrugated box or the like (47).

3. Valve according to claim 1, characterized in that the seat (54) comprises a plurality of concentric ridges (56) on said valve seat (54).

4. Valve according to claim 1, characterized in that the valve body comprises a third flange (49) adjacent to the outer end of said cylindrical portion (48), a plurality of radially slits (50) being disposed in said third flange (49), and an outwardly projecting portion (52) on the outer end of the cylindrical portion (48), said outwardly projecting portion having slots (51) corresponding with said slits (50), the resilient deformable cap engaging the outwardly projecting portion (52) of said valve body (42).

Patentansprüche

1. Ventil (40) für einenflexiblen Beutel oder eine Tasche (41), mit einem an der Außenfläche der äußeren Tasche befestigten Flansch (43), einem Ventilkörper (42), der im wesentlichen durch einen zylindrischen Teil (48) und eine bewegliche Locheinheit (59) gebildet ist, die im Ventilkörper (42) angebracht und mit wenigstens einer Schneidkante (63) an ihrem inneren Ende versehen ist, welche Locheinheit (59) im wesentlichen durch einen Schaft (60) gebildet ist, der rechtwinklig zur Außenfläche des Beutels oder der Tasche bewegbar ist und ein Ventilelement (61) trägt, das mit einem im zylindrischen Teil (48) angeordneten Sitz (54) zusammenarbeitet, dadurch gekennzeichnet, daß der Ventilkörper (42) einstückig mit dem Flansch (43) ist, daß das Ventilelement (61) am Schaft (60) im zylindrischen Teil (48) angeordnet ist, und daß das äußere Ende des Loch-Schaftes (60) mit einer manuell zusammendrückbaren Kappe (53) versehen ist, die in der unbetätigten Stellung das Ventilelement (61) gegen den Sitz (54) drückt.

2. Ventil nach Anspruch 1, dadurch gekennzeichnet, daß der Ventilkörper (42) ferner einen zweiten Flansch (44) enthält, der in Abstand außerhalb vom Flansch (43) vorgesehen ist, um einen Zwischenraum (45) zwischen dem Flansch (43) und dem zweiten Flansch (44) zur Aufnahme eines Endteiles eines Verschlusses oder einer Öffnung in einer Wellschachtel od.dergl. (47) zu definieren.

3. Ventil nach Anspruch 1, dadurch gekennzeichnet, daß der Sitz (54) eine Mehrzahl von konzentrischen Rücken (56) am Ventilsitz (54) aufweist.

4. Ventil nach Anspruch 1, dadurch gekennzeichnet, daß der Ventilkörper einen dritten Flansch (49) benachbart dem äußeren Endes des zylindrischen Teiles (48), wobei eine Mehrzahl von radialen Schlitzen (50) in diesem dritten Flansch (49) angeordnet ist, und einen auswärts vorstehenden Teil (52) am äußeren Ende des zylindrischen Teiles (48) aufweist, welcher auswärts vorstehender Teil Schlitze (51) entsprechend den genannten Schlitzen (50) hat, wobei die elastisch verformbare Kappe mit dem auswärts vorstehenden Teil (52) des Ventilkörpers (42) in Eingriff steht.

Revendications

1. Valve (40) pour une poche ou sac flexible (41) comportant une bride (43) fixée sur la surface extérieure dudit sac extérieur, un corps de valve (42) essentiellement constitué d'une partie cylindrique (48) et une unité de perçage mobile (59) montée dans ledit corps de valve (42) et munie d'au moins une arête coupante (63) sur son extrémité intérieure, ladite unité de perçage (59) étant essentiellement constituée par une tige (60) qui est déplaçable perpendiculairement à la surface extérieure de la poche ou du sac et portant un obturateur de valve (61) coopérant avec un siège (54) disposé dans ladite partie cylindrique (48), caractérisée en ce que le corps de valve (42) est en une seule pièce avec la bride (43), en ce que l'obturateur de valve (61) est disposé sur la tige (60) dans la partie cylindrique (48) et en ce que l'extrémité extérieure de ladite tige de perçage (60) est munie d'un capuchon (53) compressible à la main qui, en position non-actionnée, pousse l'obturateur de valve (61) contre le siège (54).

2. Valve selon la revendication 1, caractérisée en ce que le corps de valve (42) comporte en outre une seconde bride (44) qui est espacée vers l'extérieur à partir de la bride (43), de manière à définir un espace (45) entre ladite bride (43) et ladite seconde bride (44) pour recevoir une partie d'extrémité d'une fermeture ou d'une ouverture d'un carton ondulé ou similaire (47).

3. Valve selon la revendication 1, caractérisée en ce que le siège (54) comporte une série de nervures concentriques (56) sur ledit siège de valve (54).

4. Valve selon la revendication 1, caractérisée en ce que le corps de valve comporte une troisième bride (49) adjacente à l'extrémité extérieure de ladite partie cylindrique (48), une série de rainures radiales (50) étant disposée dans ladite troisième bride (49), et une partie en saillie vers l'extérieur (52) sur l'extrémité extérieure de la partie cylindrique (48), cette partie en saillie vers l'extérieur ayant des fentes (51) correspondant avec lesdites rainures (50), le capuchon élastiquement déformable attaquant la partie en saillie vers l'extérieur (52) dudit corps de valve (42).

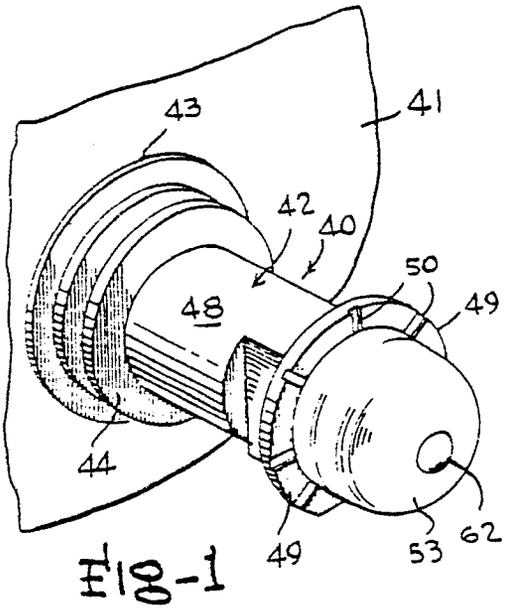

Fig-1

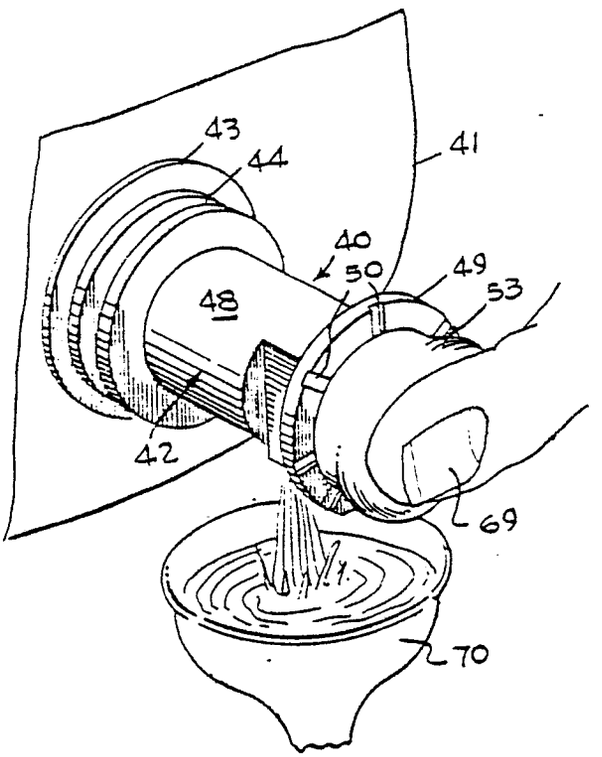

Fig-2

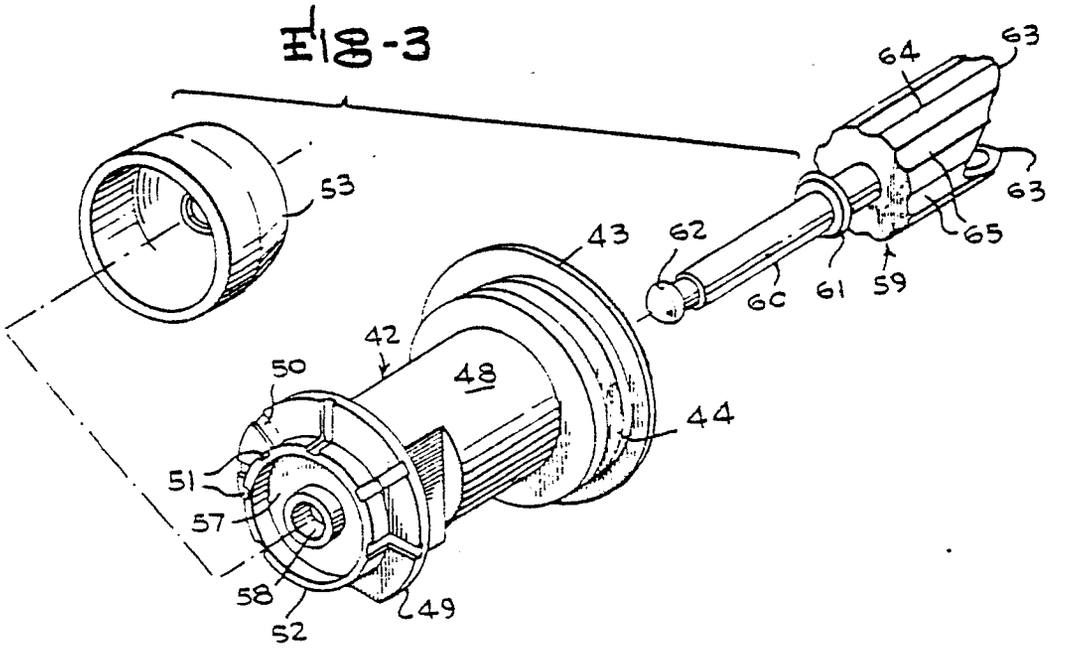

Fig-3

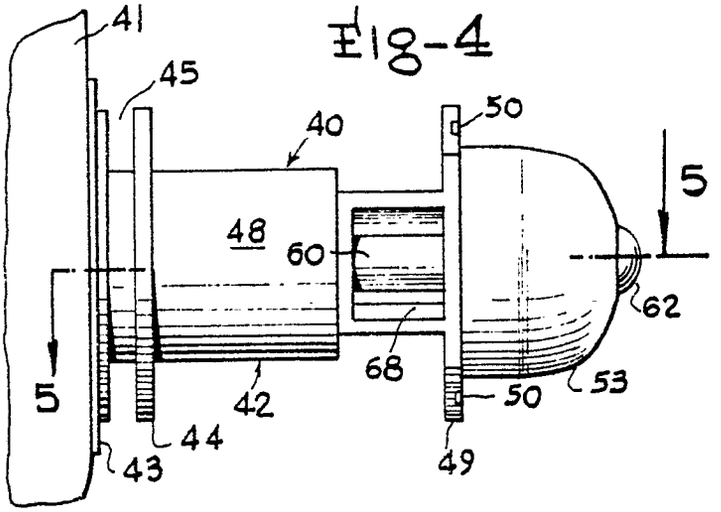

Fig-4

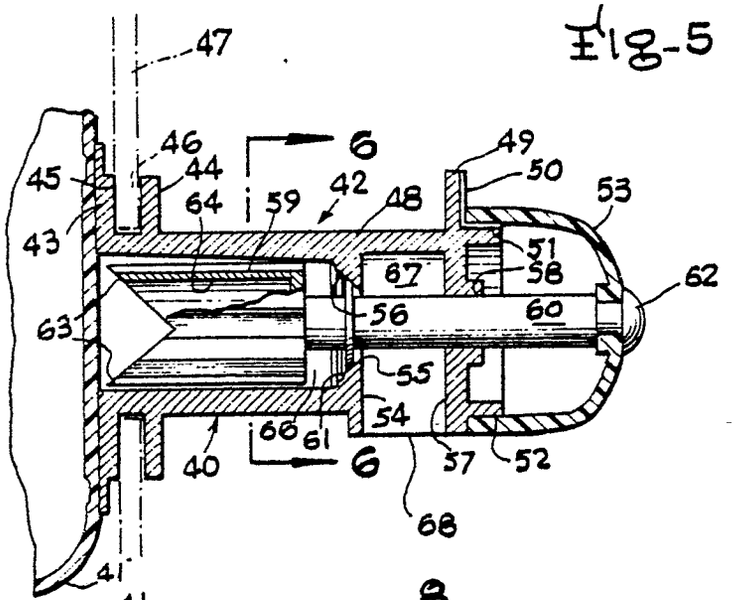

Fig-5

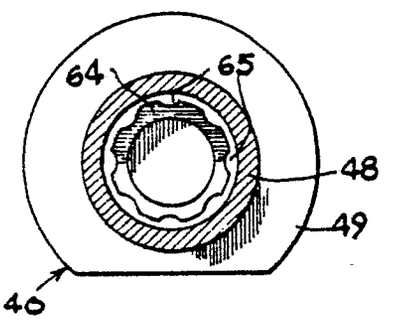

Fig-6

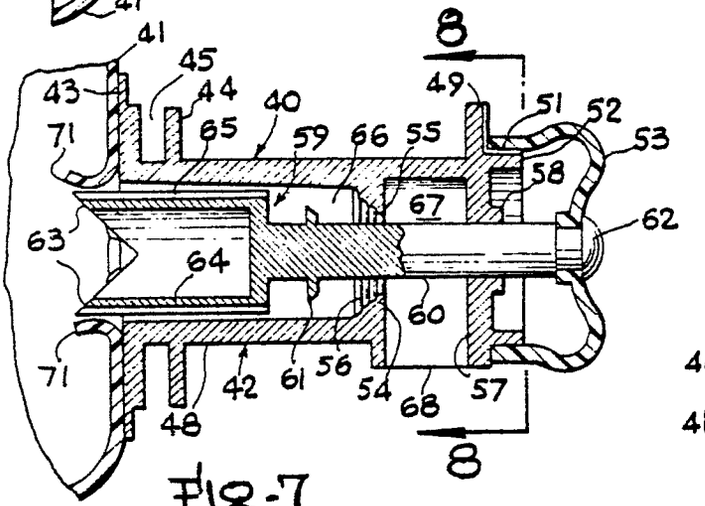

Fig-7

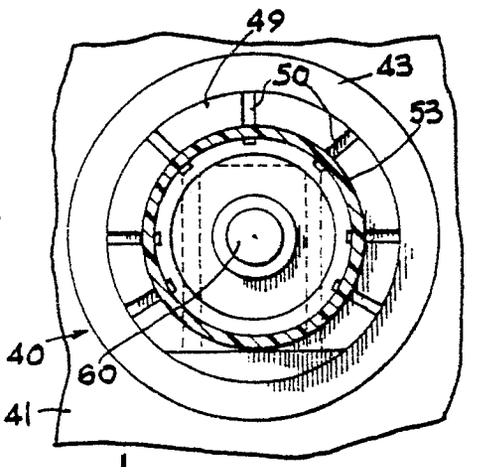

Fig-8