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Container for a fluid and a closure member

The present invention relates to a container for a fluid and a closure member therefor including a brush or brush holder portion.

Such an arrangement may be utilised, for example, to apply a fluid from inside the container directly to the brush and in a particularly preferred embodiment the brush is used to clean false dentures.

Many such containers have been proposed. Many of the proposals are impractical from a commercial point of view since they contain parts which would be difficult and expensive to manufacture. For example it is expensive to provide holes through surfaces particularly without damage to surrounding surfaces and so for a practical design these should be reduced to the minimum possible.

Other containers which have been manufactured or proposed have included several parts inter-engaging and cooperating with one another and clearly it is best if the number of parts can be reduced to a minimum.

In US Patent Specification 3 118 578 there is shown a container having a dispensing valve. There are a number of problems associated with such a valve. The sealing between the cap 10 and neck 12 is effected by the bead 36 which engages with the lipped surface 38 (Figure 4). Such a seal can be effective but requires particularly careful moulding. Because of the difficulties of making a seal of this type it would not be suitable for a relatively cheap container which is to be manufactured in large numbers. It is of paramount importance when manufacturing containers which include brushes and which are often used in a domestic environment to contain fluids which may be for example, corrosive (for example the fluid used to clean false dentures) or to contain paint, for use, for example by children, that the container and closure member form a very effective seal which is not influenced by manufacturing variations and tolerances.

Furthermore, in the US 3 118 578 the passageway 42 has to include a bend therein since at its upper end adjacent nozzle 44 it must extend axially and at its lower end it must extend transverse the axis. Such a passageway cannot easily and economically be moulded.

The present invention provides a container which meets the above problems and disadvantages of the prior US Specification 3 118 578.

The present invention provides a container such as a bottle, closed tube or the like, for a fluid comprising:

(A) a generally cylindrical neck portion having an inside surface portion and an elongate channel provided in said inside surface portion,

(B) a closure member mounted in the neck portion including (1) a portion extending inside the neck portion including an outer surface and

a fluid connection bore extending from said outer surface to a delivery point, the lower end of the bore being situated axially at a point where it lies adjacent the elongate channel but spaced axially from the lower end of the portion of the closure member extending inside the neck portion, and (2) an outer portion surrounding the neck portion of the container, the closure member and neck portion being adapted for relative rotational movement so that in one rotational position the lower end of said fluid connection bore lies adjacent and communicates with the channel and the channel communicates with the interior of the container to control liquid flow from the interior of the container to the fluid connection bore, and in another rotational position liquid does not pass from the interior of the container,

(C) limiting means being mounted on the container for limiting the extent of relative rotational movement between the neck portion and the closure member,

(D) means being provided to retain the neck portion and closure member together, characterised in that the inside surface portion of the neck portion includes an outwardly tapering surface portion which extends to the upper end of the neck portion and an inner cylindrical portion, that said channel is provided in said outwardly tapering inside surface portion and extends at least to its bottom, that there is provided a brush holder portion adjacent the delivery point which includes a longitudinally extending portion for mounting a brush, that the outer surface of said portion of the closure member extending inside the neck portion is tapered to seal with the outwardly tapering inside surface portion of the neck portion, that the lower end of said portion which extends inside the neck portion is spaced adjacent the lower end of the outwardly tapering inside surface portion but above the lower end of the elongate channel, and, that the outer portion of the closure member surrounding the neck portion extends below said portion of the closure member extending inside the neck portion and closure member together being disposed axially below the lower end of said portion.

The longitudinally extending portion may be coaxial with the neck portion or may be at an angle to the neck portion.

It will be understood, therefore, that a very effective seal is provided between the neck portion and the closure member by means of the tapering inside surface portion and the tapering outside surface of the portion of the closure member extending inside the neck portion. Manufacturing tolerances are easily taken up in these circumstances since the sealing surface is a very large surface and being slightly conical can form a very effective seal,

even if the diameters vary during manufacturing. As discussed above such a seal is extremely important in the use of the apparatus with a brush.

Furthermore, the fluid connection bore, because of the use of a brush can extend in a straight line between the sealing outer surface and the brush holder portion which simplifies manufacturing.

Altogether, the container of the invention provides a very practical arrangement which is not only excellent in use but also facilitates manufacture.

It will be understood that the words "flow control" have a broad meaning in the present specification. Thus the words cover accurate control of the flow of a fluid in which the various parts would need to be accurately dimensioned or alternatively, the restriction of the flow of the fluid from the interior of the container so as to prevent too much passing out of the container in normal use in which case normal manufacturing tolerances would suffice. In respect of the latter meaning, there will be described a dispenser which includes an arrangement for preventing too much liquid from being passed out of the container by the user and this may be particularly useful in dispensing liquid from bottles of toiletries such as perfumes, shampoos and denture cleaners.

Preferred embodiments of the invention will now be described by way of example only and with reference to the accompanying drawings in which:

FIGURE 1 is a vertical axial section of part of a container according to a first embodiment of the invention including a neck portion and a closure member,

FIGURES 2 and 3 are sections on the line A—A of Figure 1 with the neck portion and closure member respectively in first and second relative positions,

FIGURE 4 is a horizontal section on the line B—B of Figure 1,

FIGURE 5 is a plan view of the container of Figure 1,

FIGURE 6 is a vertical axial section of part of a container according to a second embodiment of the invention including a neck portion and a closure member, and,

FIGURE 7 is a plan view of the container of Figure 6.

In Figure 1 there is illustrated a container 10 having an opening 11 surrounded by an upstanding neck 12. The container which is for fluid may be of any suitable material but may preferably be a bottle moulded of flexible plastics material, the neck 12 being closed by a closure member 13 at the top of which is mounted a brush holder portion 14. The type of brush and the manner of its stapling to the brush holder portion 14 is illustrated in our earlier British patent no. 1,502,942.

The neck 12 is of generally cylindrical form there being provided a cylindrical inside surface

portion 16a and an upper outwardly tapering inside surface portion 16 which extends to the upper end of the neck portion 12. Moulded in this tapering inside surface portion 16 is a depression in the form of a channel 17 having an axial length illustrated in Figure 1 (note it does not extend to the top of the neck 12 but does extend to the bottom of the tapering inside surface portion 16) and a cross section illustrated in Figure 2 or Figure 3 (Figure 3 is clearer). The channel 17 extends generally downwardly towards the interior of the container 10 to at least the bottom of the tapered inside surface portion 16. It will be understood that if the container 10 is of moulded material then the channel 17 by virtue of its small size and being formed in the outwardly tapering surface portion may be easily formed and the mould may be easily withdrawn without damaging the remainder of the outwardly tapering inside surface portion.

The outer surface of the neck 12 includes a circumferential rib 18 and, at the base of the outer surface of the neck, two stop members 19, 20.

As is clear from Figure 1 the closure member 13 comprises an inner portion 21 for engagement within the neck 12. This inner portion 21 has an outer surface 22 which is of opposite taper to the surface 16 and is sealingly engaged therewith. However, a bore 23 extends from the surface 22 upwardly through the closure member 13 to a delivery point in the form of the brush holder 14.

The lower end 24 of the bore 23 is situated axially at a point where it may lie adjacent the channel 17. This is illustrated in Figure 1. It is, however, spaced axially from the lower end of the inner portion 21 of the closure member 13.

The lower surface of the inner portion 21 is adapted so as to be spaced adjacent the lower end of the tapered portion 16 but above the lower end of the channel 17.

The closure member 13 also includes an outer skirt portion 26 which extends downwardly below said portion 21 and surrounds the outer surface of the neck 12, the skirt portion 26 including a circumferential groove 27 adapted for engagement with the circumferential rib 18 on the outer surface of the neck to thereby retain the closure member 13 to prevent its removal. The rib 18 and groove 27 are disposed axially below the lower end of the inner portion 21. If the closure member 13 and the container 10 are made of a flexible plastics material then the closure member 13 may be pressed on to the neck 12 and the flexibility of the material will allow the skirt portion 26 to ride over the circumferential rib 18 until the groove 27 and rib 18 inter-engage. It will be seen from Figure 1 that they are shaped to facilitate this but the shape of the groove 27 and rib 18 is such as to discourage or prevent the removal of the closure member 13.

The lower edge of the skirt 26 is castellated

to provide two downwardly projecting stop members 28, 29 for engagement with the stop members 19, 20 as will be described with further reference to Figure 4.

The lower edge of the skirt portion 26 also includes an outwardly depending marker 31 and the adjacent upper surface of the container 10 carries the words OFF and ON spaced as shown in Figure 5.

The provision of the bore 23 necessitates the use of a core during moulding and this core requires a further bore 32 through the skirt portion 26 coaxial with the bore 23 but this takes no part in the operation of the apparatus of the invention.

In use the container 10 may be filled with a liquid such as a composition for cleaning dentures. It is desired to pass a controlled flow of fluid from the interior of container 10 to the base of the brush in the brush holder 14 through the bore 23. This is done by arranging the closure member 13 and neck 12 in the relative positions shown in Figure 1 which correspond to the relative positions shown in Figures 2 and 4. In this position the lower end of the bore 23 communicates with the channel 17. Fluid may pass from the interior of the container 10 (when turned upside down or squeezed) into the channel 17 where its flow is controlled as the channel 17 is of small cross section (i.e. 0.203 mm cross section) and is abutting a wall portion of the closure member 13, to the top of the channel 17 and then through the bore 23 to the base of the brush where it may pass to the tip of the brush. As shown in Figure 4, the stop members 19, 28 and 20, 29 respectively abut one another.

As is clear from Figure 4 the closure member 13 may be rotated through 90° relative to the neck 12 to the position shown in Figure 3 (and Figure 5) at which point the lower end of the bore 23 will not be in communication with the channel 17. Thus liquid may only pass into the channel 17 but cannot pass from there to the bore 23 and is prevented from passing further upwards than the channel 17 by the sealing engagement between the upper portion of the tapered surface 16 and corresponding surface of the inner portion 21 of the closure member 13. In this position, therefore, the container is sealingly closed and fluid cannot pass from the interior to the exterior.

As mentioned before, the provision of the tapered surface 16 allows for the channel 17 to be accurately moulded which allows for accurate flow control of the fluid passing through the channel and also allows for a fine surface to be moulded on the portion 16 and abutting portion 22 whereby they may sealingly engage with one another. The number of components which require to be moulded is two, that is the container 10 and the closure member 13, whereas, for example, in our copending British earlier patent application 26013/78 three separate parts are required.

Referring now to the second embodiment of the invention illustrated in Figures 6 and 7, in the drawings the same parts have been given the same reference numerals as in Figures 1 to 5. To save further description, it will be taken that all parts of the arrangement of Figures 6 and 7 are the same as the embodiment of Figures 1 to 5 except that the brush holder portion 14 is not coaxial with the neck 12 but is at an angle thereto. This is clearly illustrated in Figure 6. The arrangement is such that the bore 23 is then a straight bore passing directly from the brush holder portion 14 to the outer surface 22 and because of this construction, the closure member 13 may be moulded without the further bore 32 through the skirt portion 26.

A further advantage is that in use, the brush which extends out of the brush holder portion 14 is at an angle which facilitates cleaning of false teeth with the brush. It will be seen from Figure 7 that the container which is generally elliptical in horizontal section and the closure member 13 are arranged so that in the open position whereby the lower end of the bore 23 communicates with the channel 17, the angled brush holder portion 14 lies generally along the major axis of the elliptical cross section (when seen in plan view in Figure 7). When closed the brush holder portion lies generally at right angles thereto.

It will be understood that the second embodiment of the invention incorporates all of the advantages of the first embodiment of the invention and in particular that the neck portion of the container has an outwardly tapering inside surface portion with a channel being provided in the outwardly tapering inside surface portion.

The invention is not restricted to the details of the foregoing examples. For example, in both the embodiments, the neck 12 may form part of a tube rather than the bottle shaped container 10.

Means may also be provided for retaining the brush holder in the open and closed positions. This may be provided by a moulded stud on the neck or brush holder and a cooperating depression on the brush holder or neck respectively.

Claims

1. A container for fluid comprising:

(A) a generally cylindrical neck portion (12) having an inside surface portion (16, 16a) and an elongate channel (17) provided in said inside surface portion (16),

(B) a closure member (13) mounted in the neck portion (12) including: (1) a portion (21) extending inside the neck portion (12) including an outer surface (22) and a fluid connection bore (23) extending from said outer surface (22) to a delivery point, the lower end (24) of the bore (23) being situated axially at a point where it lies adjacent the elongate channel (17) but spaced axially from the lower end of the portion

(21) of the closure member (13) extending inside the neck portion (12), and (2) an outer portion (26) surrounding the neck portion (12) of the container, the closure member (13) and neck portion (12) being adapted for relative rotational movement so that in one rotational position the lower end (24) of said fluid connection bore (23) lies adjacent and communicates with the channel (17) and the channel (17) communicates with the interior of the container to control liquid flow from the interior of the container to the fluid connection bore (23), and in another rotational position liquid does not pass from the interior of the container,

(C) limiting means (19, 20) being mounted on the container for limiting the extent of relative rotational movement between the neck portion (12) and the closure member (13),

(D) means (18), (27) being provided to retain the neck portion (12) and closure member (13) together,

characterised in that, the inside surface portion (16a) of the neck portion (12) includes an outwardly tapering surface portion (16) which extends to the upper end of the neck portion (12) and an inner cylindrical portion (16a), that said channel (17) is provided in said outwardly tapering inside surface portion (16) and extends at least to its bottom, that there is provided a brush holder portion (14) adjacent the delivery point which includes a longitudinally extending portion for mounting a brush, that the outer surface (22) of said portion (21) of the closure member (13) extending inside the neck portion (12) is tapered to seal with the outwardly tapering inside surface portion (16) of the neck portion (12), that the lower end of said portion (21) which extends inside the neck portion (12) is spaced adjacent the lower end of the outwardly tapering inside surface portion (16) but above the lower end of the elongate channel (17), and, that the outer portion (26) of the closure member (13) surrounding the neck portion (12) extends below said portion (21) of the closure member (13) extending inside the neck portion (12), the means (18), (27) retaining the neck portion (12) and closure member (13) together being disposed axially below the lower end of said portion (21).

2. A container as claimed in claim 1 characterised in that the fluid connection bore (23) is straight.

3. A container as claimed in claim 1 characterised in that the longitudinally extending portion for mounting a brush of the brush holder portion (14) extends coaxial with the neck portion (12).

4. A container as claimed in claim 3 characterised in that there is provided a bore (32) through the outer portion (26) of the closure member (13) surrounding the neck portion (12), this bore (32) being aligned with the fluid connection bore (23).

5. A container as claimed in claim 1 or 2 characterised in that the longitudinally extending portion for mounting a brush of the brush holder portion (14) extends at an angle to the neck portion (12).

Revendications

1. Un récipient pour fluide comprenant:

(A) une partie (12) formant un goulot sensiblement cylindrique ayant une partie de surface interne (16, 16a) et un canal allongé (17) ménagé dans ladite partie de surface interne (16),

(B) un organe de fermeture (13) monté dans la partie formant goulot (12) et comprenant: (1) une partie (21) s'étendant à l'intérieur de la partie formant goulot (12) et comportant une surface externe (22) et un perçage de liaison de fluide (23) s'étendant de ladite surface externe (22) jusqu'à un point de distribution, l'extrémité inférieure (24) du perçage (23) étant située axialement en un point où elle se trouve adjacente au canal allongé (17) mais espacée axialement de l'extrémité inférieure de la partie (21) de l'organe de fermeture (13) qui s'étend à l'intérieur de la partie formant goulot (12), et (2) une partie externe (26) entourant la partie formant goulot (12) du récipient, l'organe de fermeture (13) et la partie formant goulot (12) étant agencés pour un mouvement de rotation relative de sorte que dans une position de rotation l'extrémité inférieure (24) dudit perçage de liaison de fluide (23) se trouve adjacente au canal (17) et communique avec ce dernier, et le canal (17) communique avec l'intérieur du récipient afin de commander l'écoulement du liquide de l'intérieur du récipient jusqu'au perçage de liaison de fluide (23) et que dans une autre position de rotation le liquide ne s'écoule pas à partir de l'intérieur du récipient,

(C) des moyens de limitation (19, 20) qui sont montés sur le récipient afin de limiter l'amplitude du mouvement de rotation relative entre la partie formant goulot (12) et l'organe de fermeture (13),

(D) des moyens (18, 27) destinés à retenir la partie formant goulot (12) et l'organe de fermeture (13) l'un avec l'autre, caractérisé en ce que la partie de surface interne (16a) de la partie formant goulot (12) présente une partie de surface (16) conique s'ouvrant par sa grande base vers l'extérieur et qui s'étend jusqu'au bord supérieur de la partie formant goulot (12) et une partie cylindrique interne (16a) que ledit canal (17) est ménagé dans ladite partie de surface interne conique vers l'extérieur (16) et s'étend au moins jusqu'à sa base, qu'il est prévu une partie formant porte-brosse (14) adjacente au point de distribution et qui comprend une partie s'étendant longitudinalement et destinée au montage d'une brosse, que la surface externe (22) de ladite partie (21) de l'organe de fermeture (13) qui s'étend à l'intérieur de la partie formant goulot (12) est conique afin de

former un joint étanche avec la partie de surface interne cônica (16) de la partie formant goulot (12), que l'extrémité inférieure de ladite partie (21) qui s'étend à l'intérieur de la partie formant goulot (12) est espacée en position adjacente à l'extrémité inférieure de la partie de surface interne (16) cônica mais située au-dessus de l'extrémité inférieure du canal allongé (17), et que la partie externe (26) de l'organe de fermeture (13) qui entoure la partie formant goulot (12) s'étend sous ladite partie (21) de l'organe de fermeture (13) qui s'étend à l'intérieur de la partie formant goulot (12), les moyens (18, 27) retenant la partie formant goulot (12) et l'organe de fermeture (13) l'un avec l'autre étant disposés axialement sous l'extrémité inférieure de ladite partie (21).

2. Un récipient tel que revendiqué dans la revendication 1 caractérisé en ce que le perçage de liaison de fluide (23) est rectiligne.

3. Un récipient tel que revendiqué dans la revendication 1 caractérisé en ce que la partie s'étendant longitudinalement et destinée au montage d'une brosse de la partie formant porte-brosse (14) s'étend coaxialement à la partie formant goulot (12).

4. Récipient tel que revendiqué dans la revendication 3 caractérisé en ce qu'il est prévu un perçage (32) traversant la partie externe (26) de l'organe de fermeture (13) qui entoure la partie formant goulot (12), ce perçage (32) étant aligné avec le perçage de liaison de fluide (23).

5. Un récipient tel que revendiqué dans la revendication 1 ou 2 caractérisé en ce que la partie s'étendant longitudinalement et destinée au montage d'une brosse de la partie formant porte-brosse (14) s'étend en étant inclinée d'un certain angle sur la partie formant goulot (12).

Patentansprüche

1. Flüssigkeitsbehälter mit

(A) einem im wesentlichen zylindrischen Halsabschnitt (12) mit einer Innenfläche (16, 16a) und einem länglichen Kanal (17), der in der Innenfläche (16) ausgebildet ist,

(B) einem am Hals (12) befestigten Verschluss (13) mit (1) einem Abschnitt (21), der sich in dem Hals (12) erstreckt und eine Außenfläche (22) und eine Verbindungsbohrung (23) für die Flüssigkeit aufweist, die sich von der Außenfläche (22) zu einem Auslaß erstreckt, wobei das untere Ende (24) der Bohrung (23) axial an einer Stelle in der Nähe des länglichen Kanals (17) und in axialem Abstand vom unteren Ende des Abschnitts (21) des Verschlusses (13) liegt, der sich im Hals (12) erstreckt, und mit (2) einem äußeren Abschnitt (26), der den Hals (12) des Behälters umgibt, wobei der Verschluss (13) und der Hals (12) für eine relative Drehbewegung so ausgebildet sind, daß in der einen Drehstellung das untere

Ende (24) der Verbindungsbohrung (23) nahe dem Kanal (17) liegt und mit diesem in Verbindung steht, der wiederum mit dem Innenraum des Behälters in Verbindung steht, um die Flüssigkeitsströmung aus dem Innenraum des Behälters in die Verbindungsbohrung (23) zu steuern, und daß in der anderen Drehstellung die Flüssigkeit nicht aus dem Innenraum des Behälters ausläuft,

(C) einem Anschlag (19, 20) am Behälter zum Begrenzen der relativen Drehbewegung zwischen dem Hals (12) und dem Verschluss (13) und mit

(D) einer Einrichtung (18, 27) zum Zusammenhalten des Halses (12) und des Verschlusses (13),

dadurch gekennzeichnet,

daß die Innenfläche (16a) des Halses (12) eine nach außen konisch verlaufende Fläche (16), die sich zum oberen Ende des Halses (12) erstreckt, und einen inneren Zylinderabschnitt (16a) aufweist,

daß der Kanal (17) in der sich nach außen konisch erweiternden Innenfläche (16) ausgebildet ist und sich zumindest bis zu deren unterem Ende erstreckt,

daß in der Nähe des Auslasses ein Bürstenhalter (14) mit einem sich in Längsrichtung erstreckenden Abschnitt zum Befestigen einer Bürste vorgesehen ist,

daß die Außenfläche (22) des Abschnitts (21) des Verschlusses (13), die sich in den Hals (12) erstreckt, zum Abdichten gegenüber der nach außen sich konisch erweiternden Innenfläche (16) des Halses (12) konisch ausgebebildet ist,

daß das untere Ende des Abschnitts (21), der sich in den Hals (12) erstreckt, in der Nähe des unteren Endes der sich nach außen konisch erweiternden Innenfläche (16) jedoch oberhalb des unteren Endes des länglichen Kanals (17) beabstandet ist und

daß der den Hals (12) umgebende äußere Abschnitt (26) des Verschlusses (13) sich über den sich innerhalb des Halses (12) erstreckenden Abschnitt (21) des Verschlusses (13) nach unten erstreckt, wobei die den Hals (12) und den Verschluss (13) aneinander haltenden Einrichtungen (18, 27) axial unterhalb des unteren Endes des Abschnitts (21) angeordnet sind.

2. Behälter nach Anspruch 1, dadurch gekennzeichnet, daß die Verbindungsbohrung (23) für die Flüssigkeit gerade ist.

3. Behälter nach Anspruch 1, dadurch gekennzeichnet, daß der sich in Längsrichtung erstreckende Abschnitt des Bürstenhalters (14) zum Haltern einer Bürste sich coaxial zum Hals (12) erstreckt.

4. Behälter nach Anspruch 3, dadurch gekennzeichnet, daß durch den den Hals (12) umgebenden äußeren Abschnitt (26) des Verschlusses (13) eine Bohrung (32) vorgesehen ist, die mit der Verbindungsbohrung (23) für die

Flüssigkeit ausgerichtet ist.

5. Behälter nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der sich in Längsrichtung

erstreckende Abschnitt des Bürstenhalters (14) zum Haltern einer Bürste sich unter einem Winkel gegenüber dem Hals (12) erstreckt.

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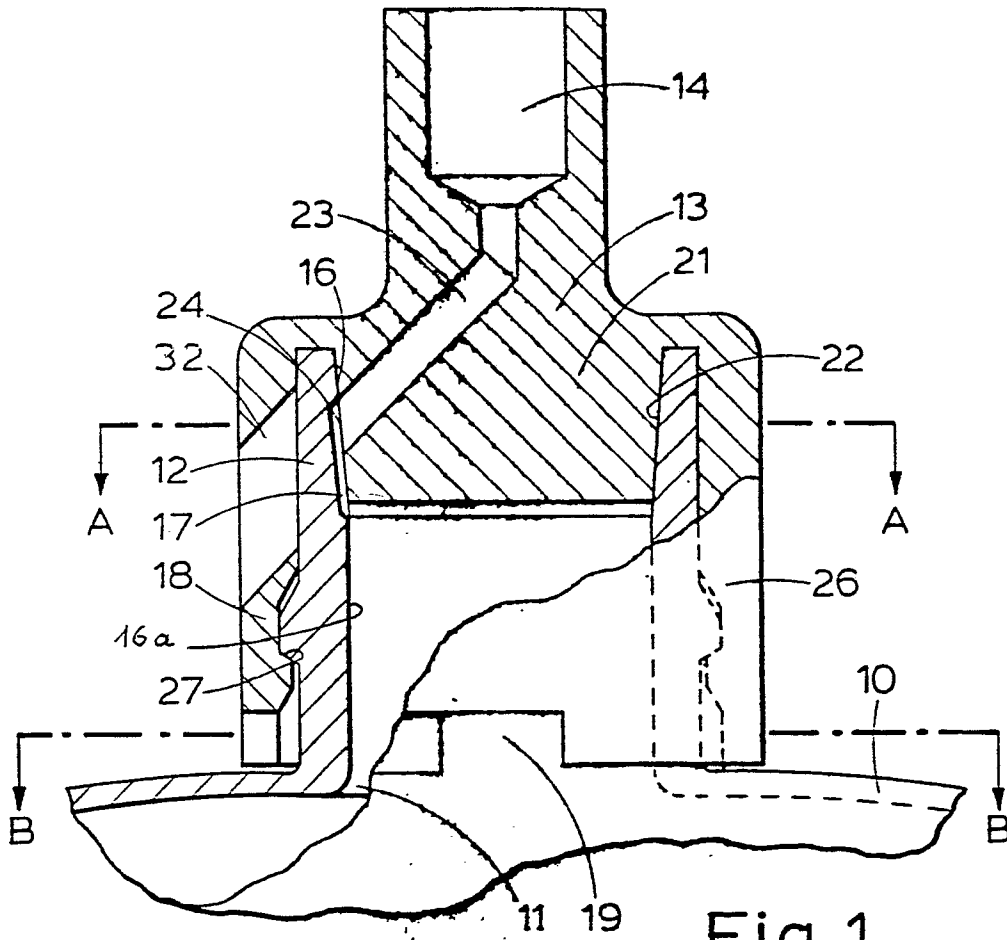


Fig. 1

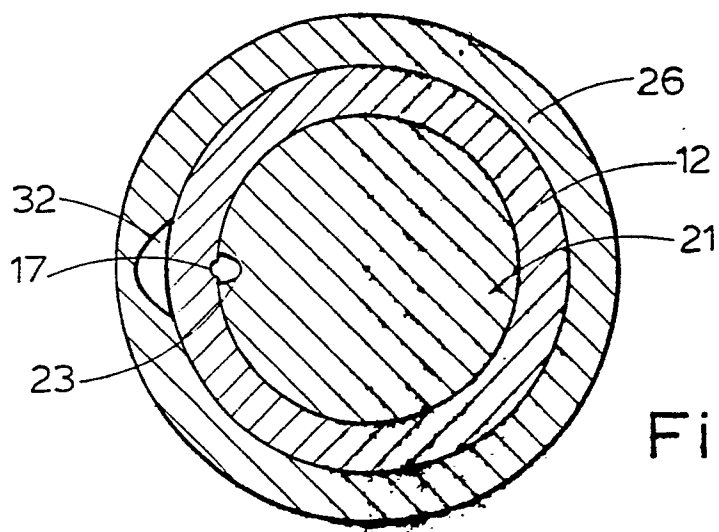


Fig. 2

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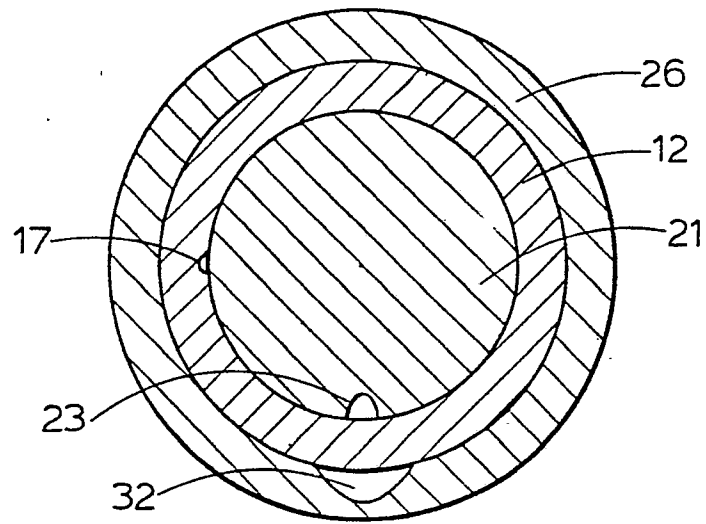


Fig. 3

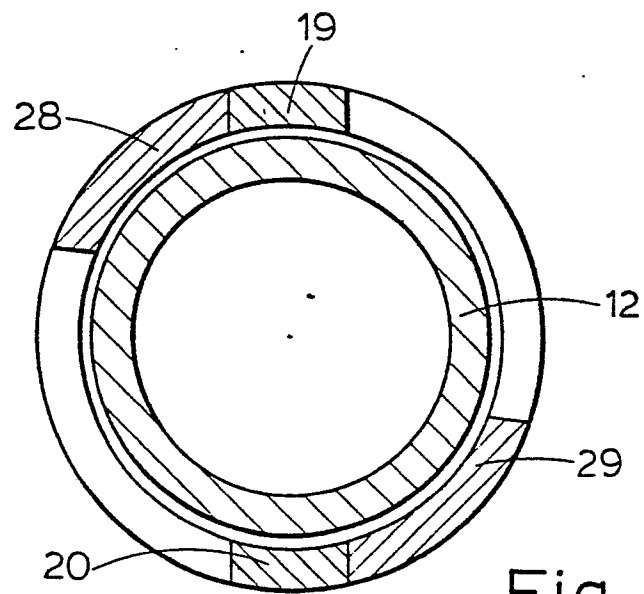


Fig. 4

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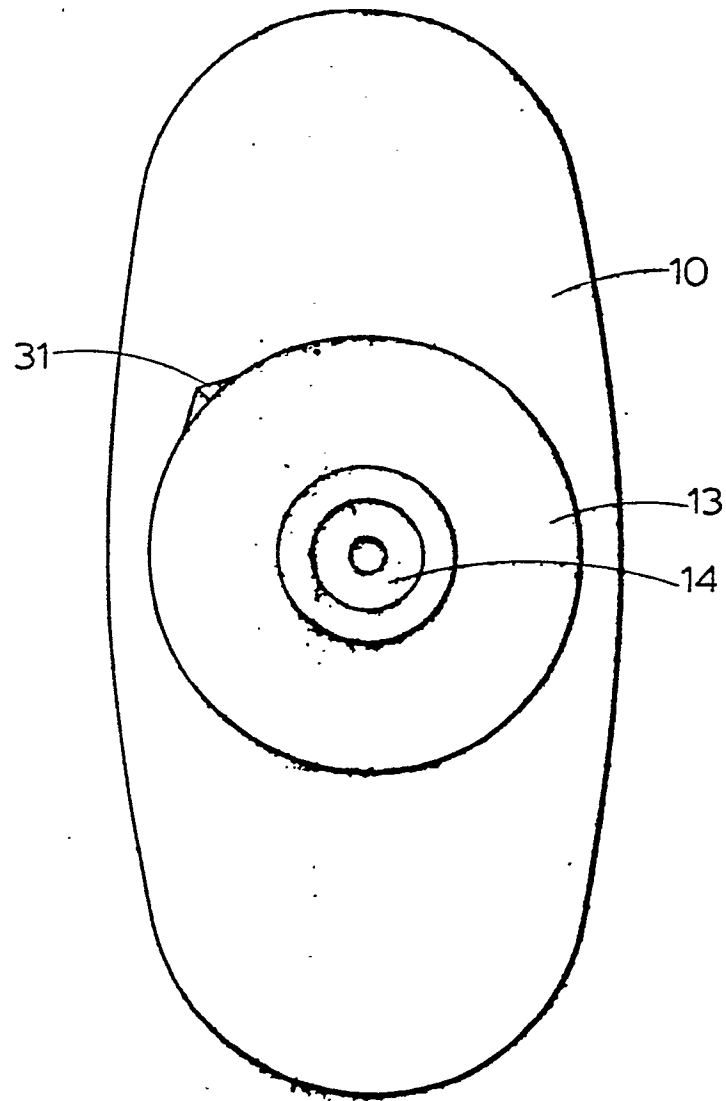


Fig. 5

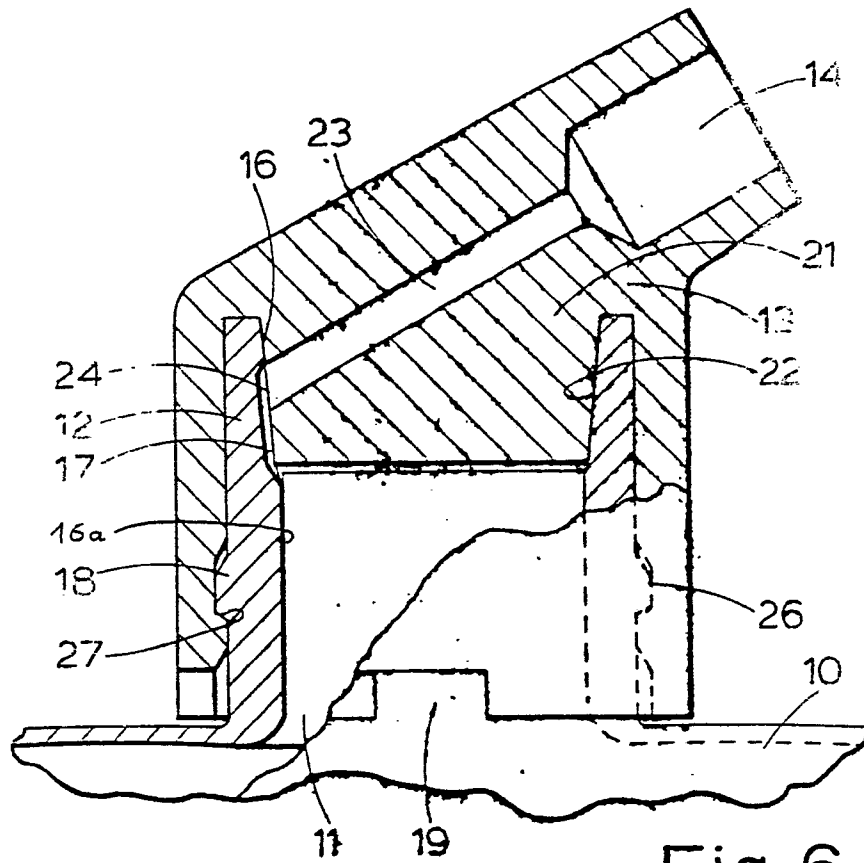


Fig. 6

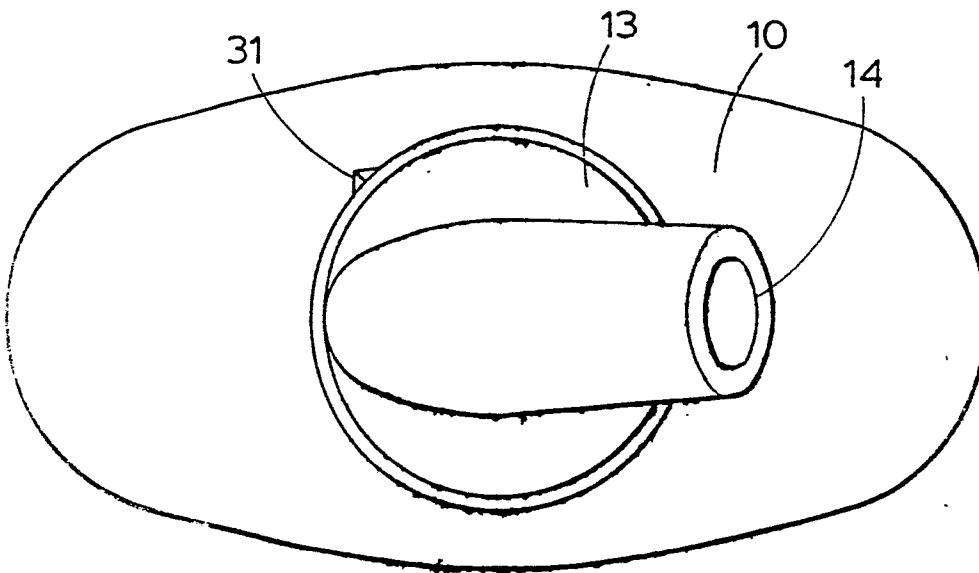


Fig. 7