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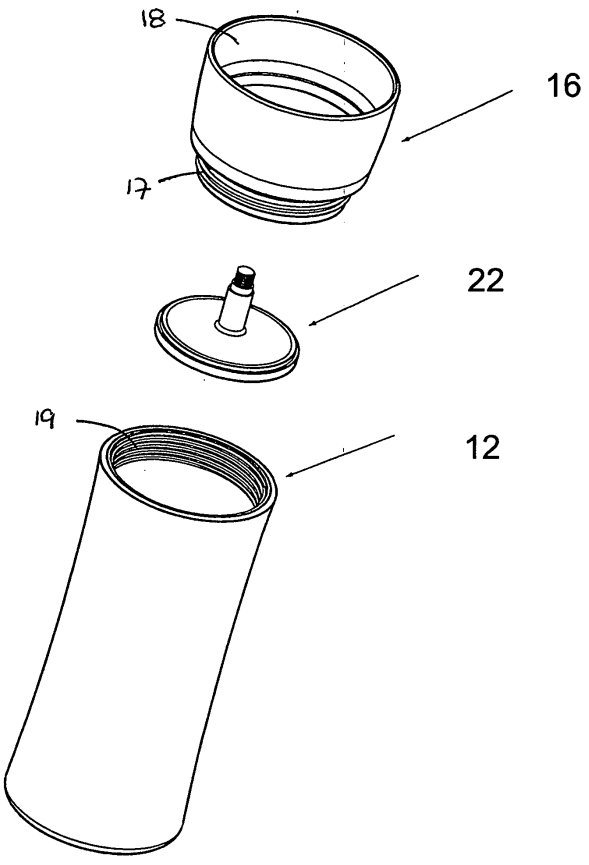
(54) **Travel mug**

(57) A travel mug that is easy to clean and allows a user to drink from any side of the mug.

Figure 5



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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a travel mug and more particularly to a travel mug that is easy to clean.

BACKGROUND OF THE INVENTION

[0002] Travel mugs are known and used by people who wish to drink a beverage while on the move, with the beverage being kept at its appropriate temperature, i.e. hot or cold. Many different types of travel mugs are known, some including buttons and/or levers located on the outside of the travel mug for opening and closing the lid portion of the mug.

[0003] In general, the travel mugs include a cap or top portion that includes an opening that may be opened and closed by a user when they want to drink the beverage inside the mug. These cap or top portions generally include fixed internal mechanisms that assist in the opening and closing of the opening on the mug. The inclusion of such internal mechanisms can provide for an intricate cap or top portion that may be difficult to clean.

[0004] Some travel mugs include a top opening that is only located on one side or one portion of the cap or top portion. Such a configuration may restrict a user in their ability to drink from the travel mug since the orientation of the mug must be correct to allow for the liquid to pour out of the opening and be received by the user's mouth.

SUMMARY OF THE INVENTION

[0005] The present invention provides a travel mug that is easy to disassemble and clean. The present invention also provides a travel mug that may be filled from the top without the necessity of removing the top cap. The present invention further provides a travel mug that includes a central button that allows a user to open and close the fluid path for the liquid using one hand.

[0006] In one embodiment the present invention provides a travel mug that includes a valve member that is moved between an open and closed position by an internal gear mechanism which is connected to a button that a user can depress downwardly to initiate movement of the internal gear mechanism.

[0007] In another embodiment the present invention provides a travel mug comprising a body for receiving fluid, a lid portion that is releasably connected to the body and defining a fluid passageway therethrough. The lid portion has a valve seat located at a lower end. A plunger is releasably connected to the lid portion and is configured to move between a closed position, in which the plunger engages the valve seat and blocks fluid from flowing through the fluid passageway, and an open position, in which the plunger is disposed away from the valve seat. The travel mug also includes a button, connected to the lid portion, and configured to move the plunger between the open and closed positions.

[0008] In a further embodiment the button of the travel mug is sized to substantially fill the diameter of the lid portion while defining a channel between the lid portion and the peripheral edge of the button. The button is preferably a dome shaped button.

[0009] In a further embodiment the travel mug includes a gear assembly, disposed below the button and attached to the button, the gear assembly being configured to move the plunger between the open and closed positions.

[0010] In an alternative embodiment, the present invention provides a travel mug comprising a lower body, an upper body attached to the lower body, the upper body including a valve seat and defining a fluid channel and a valve member disposed below the valve seat and releasably attached to the upper body. The valve member has a closed position in which the valve member engages the valve seat and an open position in which the valve member is disposed away from the valve seat. The travel mug further includes a gear assembly disposed above the valve seat and the valve member and attached to the valve member and adapted to move the valve member between the open and closed positions.

[0011] In a further embodiment, the valve member is releasably attached to the upper body of the travel mug so that the valve member can be removed to facilitate cleaning of the upper body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The present invention will be described in further detail below with reference to the accompanying Figures in which:

[0013] Figure 1 is a perspective view of one embodiment of the travel mug of the present invention;

[0014] Figure 2 is a side view of the travel mug of Figure 1;

[0015] Figure 3 is a top view of the travel mug of Figure 1;

[0016] Figure 4 is an exploded view of the body of the travel mug of the present invention;

[0017] Figure 5 is a partially exploded perspective view of the travel mug of Figure 1 showing the components of the travel mug that are separable by a user;

[0018] Figure 6 is an exploded perspective view of the travel mug of Figure 1;

[0019] Figure 7 is a cross sectional view of the cap portion of the travel mug of the present invention showing the plunger in a sealed configuration;

[0020] Figure 8 is a cross sectional view of the cap portion of the travel mug of the present invention showing the plunger in an open configuration;

[0021] Figure 9 is a bottom perspective view of the cap of the travel mug of the present invention with the plunger removed; and

[0022] Figure 10 is a bottom view of the cap of Figure 9.

DETAILED DESCRIPTION OF THE INVENTION

[0023] The present invention will now be described in further detail with reference to Figures 1 through 10 in which the travel mug is indicated generally at numeral 10.

[0024] The travel mug 10 includes a main body portion 12, or lower body, that includes an outer body 14 and an inner body 15, seen in Figure 4. The outer body 14 is formed from material that will protect a user's hand from the internal heat or cold of the travel mug 10, while the inner body 15 is formed from material that will insulate the beverage and keep the beverage either hot or cold. Examples of the materials that may be used include, but are not limited to, polypropylene. It will be understood that the inner and outer body do not have to be formed from the same material, for example the inner body may be formed from stainless steel and the outside body formed from plastic. Alternatively, both bodies may be formed from the same material, for example stainless steel. The two body embodiment provides a gap in between the bodies to provide insulation and to prevent heat escape to the outer body 14.

[0025] The travel mug 10 is shaped and sized to be easily held by a user and to hold a sufficient amount of beverage for drinking by the user. As can be seen from the accompanying Figures, the main body portion 12 is preferably substantially cylindrical in shape having a slightly flared lower and upper end.

[0026] The main body 12 is configured to receive a cap portion 16 thereon. In one embodiment, illustrated clearly in Figures 5 and 6, the cap portion 16 and the upper end of the travel mug 10 include respective threads 17,19 that are operable to matingly connect and releasably attach the cap portion 16 to the main body 12.

[0027] The cap portion 16 includes upper peripheral wall 18 that extends around the circumference of the cap portion 16 at an upper end thereof. The cap portion 16 also includes a button 20 that is connected to a plunger 22, the button 20 and plunger 22 being operable to move simultaneously with each other when connected to each other, described further below.

[0028] The button 20 is located within the cap portion 16 at a position that is substantially lower than the top edge of the peripheral wall 18 clearly seen in Figures 7 and 8. The part of the peripheral wall 18 that extends above the button 20 forms a cavity, defined by the upper surface of the button 20 and the wall 18, within which fluid can be received either for drinking by a user or for filling the main body 12, described in further detail below.

[0029] As can be seen in the Figures, the button 20 is dome shaped and fits within the cap portion 16 to substantially fill the diameter of the cap but without abutting the internal portion of the peripheral wall 18 of the cap portion 16. The size and placement of the button 20 within the cap portion 16 can be clearly seen in Figures 7 and 8. As can be seen, a channel is located around the periphery of the button 20 that will allow fluid to pass by the button and through and into the internal part of the cap portion 16. The ability of fluid to flow around any portion of the periphery of the button allows a user to be able to drink from any side of the travel mug 10 since fluid is not limited to a single path. The dome shape of the button 20, in combination with the peripheral wall 18 allows a user to pour fluid into the cap portion 16 and on top of the button 20 to fill the travel mug 10, when the plunger is in the open configuration, described further below. The dome shape of the button 20 will assist the fluid in flowing towards the opening or channel that surrounds the button 20 and down through the cap portion 16.

[0030] At the lower end of the cap portion 16 is lower peripheral wall 24 which, in the illustrated embodiment, includes the threads 17 that allow cap portion 16 to be connected to the main body 12.

[0031] As stated above, the button 20 and the plunger 22 are connected in such a way that allows them to be moved simultaneously. The button 20 and plunger 22 are configured to move between two positions, an open position, which allows liquid to flow through the cap portion 16, illustrated in Figure 8, and a closed position which prevents liquid from flowing through the cap portion 16, illustrated in Figure 7. In the closed position the plunger 22 abuts the bottom of the lower peripheral wall 24 and forms a seal with the bottom of the wall 24, which may also be referred to as valve seat 25. In the open position, the plunger 22 is lowered away from valve seat 25 and the lower peripheral wall 24 and liquid is able to flow around the plunger 22 and through the cap portion 16, as indicated by arrow A in Figure 8. The open and closed positions will be described in further detail below.

[0032] The connection of the button 20 to the plunger 22 may be any connection that allows for the plunger 22 to be removed from the button 20 by a user, i.e. a releasable connection. In the preferred embodiment, the plunger 22 is connected to the button 20 through mating threads, located at the top part of the plunger and in the central portion of the button. This connection is illustrated in Figures 7 and 8. The threads on the button, indicated generally at 21 mate with corresponding threads 23 on the plunger 22. It will be understood that other means of connection may be used that allow for the plunger 22 to be easily removed from the button 20 and cap portion 16 by a user. The easy removal of the plunger 22 allows for the user to thoroughly clean the cap portion 16. Removal of the plunger 22 allows a user to run water, or other cleaning fluids, through the cap portion 16 and achieve a steady flow of the liquid through the cap portion 16 to ensure sufficient cleaning. When the plunger 22 is removed the pathway of the cleaning fluid is not limited to the path that fluid flows through when the plunger 22 is attached and in use. Figure 5 illustrates the components of the travel mug that may be separated by a user for easy cleaning.

[0033] As can be see in Figure 6, in a preferred embodiment, the plunger 22 includes a plunger seal 26 that fits around the lower portion of the plunger 22. The plunger seal 26 is made of a deformable material, such as

silicone, and in use the plunger seal 26 connects with the lower peripheral wall 24 to form a seal when the cap portion 16 is in the closed configuration.

[0034] The cap portion 16 also includes a cap seal 28, shown in Figure 6, that fits on the external surface of the cap portion at the point at which the lower and upper peripheral walls meet, seen clearly in Figures 7 and 8. The cap seal 28 is used to maintain a seal, and prevent liquid leaks, between the cap portion 16 and the main body 12 when the cap portion 16 is received on the main body 12 and the travel mug 10 is in use.

[0035] The connection and movement of the plunger 22 and the button 20 will now be described in further detail with reference to Figures 6-10. The cap portion 16 includes a button collar 30 that is located within the cap portion 16. Button collar 30 is connected to the cap portion 16 by arms 32 that extend outwardly from the bottom of the button collar 30 to the internal peripheral wall of the cap portion 16. The arms 32 are spaced around the button collar 30 and define apertures therebetween that allow fluid to pass between adjacent arms 32.

[0036] Located within the button collar 30 is internal gear mechanism 34 that allows the button 20 and plunger 22 to move up and down between the open and closed positions. The internal gear mechanism 34 includes an upper gear member 36, a lower gear member 38 and a spring 40.

[0037] The button 20 is connected to the top end of the internal gear mechanism 34, and specifically to the upper gear member 36. The connection of the button 20 to the upper gear member 36 may be by any means that provides a secure fit between the two components. In a preferred embodiment the button 20 is connected to the upper gear member 36 using a snap fit.

[0038] Turning to the internal gear mechanism 34 shown in Figure 6, the internal gear mechanism 34 operates between a closed position in which the plunger 22 engages the lower end of the peripheral wall 24, and an open position in which the plunger 22 is displaced away from the lower end of the peripheral wall 24 and fluid is able to flow between the two components. The internal gear mechanism 34 operates as per known gear mechanisms in the art. The following description of the internal gear mechanism 34 is provided as an example of the type of gear that may be used, however, it will be understood that the travel mug of the present invention is not limited to the use of the specific gear mechanism described below.

[0039] The lower gear member 38 of internal gear mechanism 34 includes a plurality of spaced apart upwardly projecting teeth 42 that are spaced around the periphery of the lower portion of the lower gear member 38. Extending upwardly from the teeth 42 is cylindrical body portion 46.

[0040] The upper gear member 36 also includes a cylindrical body portion 48 that is sized to be received on the cylindrical body portion 46 of the lower gear member 38. Extending downwardly from cylindrical body 48 are downwardly projecting teeth 50 that are configured to engage the upwardly projecting teeth 42 on the lower gear member 38. In addition, the upper gear member 36 includes a plurality of spaced apart projections 44 located around the periphery of the lower end of the upper gear member 36.

[0041] Spring 40 is positioned below the lower gear member 38 such that the lower gear member 38 is biased upwardly towards the upper gear member 36.

[0042] The button collar 30 includes a series of spaced apart internal slots, partly shown in Figure 6 at numeral 31, that have alternating lengths, the shorter slots are not shown in the Figure. Each slot is sized to be able to receive the projections 44 of the upper gear member 38 and the upwardly projecting teeth 42 of the lower gear member 38.

[0043] As stated above, the lower gear member 38 is biased upwardly by the spring 40. In operation downward motion, or pressure, on the upper gear member 36, through downward motion on the button by a user, translates to a downward force on the lower gear member 38. When downward motion is placed on the upper gear member 36, the teeth 50 of the upper gear member 36 connect with the teeth 42 of the lower gear member 38 which translates the downward motion to the lower gear member 38 pushing it downwards against the biasing force of the spring 40.

[0044] The force and angle of the downwardly projecting teeth 50 on the upwardly projecting teeth 42 causes the lower gear member 38 to move downwards, releasing the teeth 50 from the slot in the button collar 30, allowing for rotation of the lower gear member 38. Rotation of the lower gear member 38 will be restricted by the interaction of the downwardly projecting teeth 50 with the upwardly projecting teeth 42 as they fit together. As the lower gear member 38 rotates the spring 40 will force the lower gear member 38 upwardly and the upwardly extending teeth 42 will be received in the next slot on the button collar 30.

[0045] Continual downward motion on the upper gear member 36, by the user pressing on the button, will continue to rotate the lower gear member 38. When the teeth 42 are received in the longer slots 31 on the button collar 30 then the gear mechanism 34 is biased upwards by the spring and the plunger is moved into the closed position. When the teeth 42 are received in the shorter slots 31, the vertical movement of the lower gear member 38 is inhibited and the gear mechanism 34 stays in a lowered position, with the plunger being held in the open position. Therefore, it will be understood that the movement of the lower gear member 38 and the interaction with the upper gear member 36 moves the plunger and button, which are connected to the gear assembly through the attachment of the button, as described above, between the open and the closed positions, described herein.

[0046] The use of the travel mug 10, and in particular the cap portion 16 will now be described with reference to Figures 7 and 8.

[0047] In use, in the closed position, the button 20 is

in a raised position, as shown in Figure 7, and the plunger 22 engages the lower end, or valve seat 25, of the lower peripheral wall 24 to form a seal with the valve seat 25/lower end of wall 24. In this position, fluid is not able to flow from the main body 12 through the cap portion 16 or vice versa.

[0048] When the user wishes to drink from the travel mug, or to fill the travel mug through the cap portion 16, the user presses down on the button 20. The downward movement of the button 20 translates via the internal gear mechanism 34 to a downward movement of the plunger 22 forcing the plunger away from the lower end of the wall 24 into the open position. Once the plunger has been moved into the open position the plunger 22 is spaced from the lower end of the wall 24 and a passage is available for fluid to flow through the cap portion 16, shown by arrow A in Figure 8.

[0049] Once the user has finished drinking or filling the mug, the button is pressed again and the internal mechanism 34 translates the downward movement to close the cap and return the plunger 22 to the initial position in which it engages the valve seat 25/lower end of the wall 24.

[0050] It will be clear from the description provided above and the description of the configuration of the button, that a user is able to fill the travel mug without removing the cap portion 16. As described above, the button 20 is dome shaped and extends across the diameter of the cap portion 16. As seen in Figures 7 and 8 a space is maintained around the periphery of the button 20 so that fluid may flow past the button 20. Therefore, when a user wishes to fill the travel mug, the button 20 is pressed to move the plunger 22 and disengage it from the lower end of the wall 24 to open up a channel through which fluid can flow. Once a fluid passage is opened the user can pour fluid into the top of the cap portion 16. The liquid flows off the surface of the button 20 downwards towards the peripheral channel and down through the cap portion 16 into the travel mug. Liquid can also be held in the cap portion 16 as it flows through into the travel mug since a cavity is defined by the peripheral wall 18 and the button 20 so excess fluid will not spill out of the travel mug while it is being filled.

[0051] While this invention has been described with reference to illustrative embodiments and examples, the description is not intended to be construed in a limiting sense. Thus, various modification of the illustrative embodiments, as well as other embodiments of the invention, will be apparent to persons skilled in the art upon reference to this description. It is therefore contemplated that the appended claims will cover any such modifications or embodiments. Further, all of the claims are hereby incorporated by reference into the description of the preferred embodiments.

[0052] Any publications, patents and patent applications referred to herein are incorporated by reference in their entirety to the! same extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated by reference in its entirety.

Claims

1. A travel mug comprising
   a body for receiving fluid;
   a lid portion, releasably connected to the body and defining a fluid passageway therethrough, the lid portion having a valve seat located at a lower end thereof;
   a plunger releasably connected to the lid portion and configured to move between a closed position, in which the plunger engages the valve seat and blocks fluid from flowing through the fluid passageway, and an open position, in which the plunger is disposed away from the valve seat; and
   a button, connected to the lid portion, and configure to move the plunger between the open and closed positions.

2. The travel mug according to claim 1, wherein the button is sized to substantially fill the diameter of the lid portion and defining a channel between the lid portion and the peripheral edge of the button.

3. The travel mug according to claim 1, wherein the button is a dome shaped button.

4. The travel mug according to claim 1, further comprising a gear assembly, disposed below the button and attached to the button, the gear assembly configured to move i the plunger between the open and closed positions.

5. A travel mug comprising:

   a lower body;
   an upper body attached to the lower body, the upper body including a valve seat and defining a fluid channel;
   a valve member disposed below the valve seat and releasably attached to the upper body, the valve member having a closed position in which the valve member engages the valve seat and an open position in which the valve member is disposed away from the valve seat; and
   a gear assembly disposed above the valve seat and the valve member and attached to the valve member and adapted to move the valve member between the open and closed positions.

6. The travel mug according to claim 5, wherein the upper body further comprises a button portion and wherein the gear assembly is adapted to move the valve member between the open and closed positions by depressing downwardly on the button por-

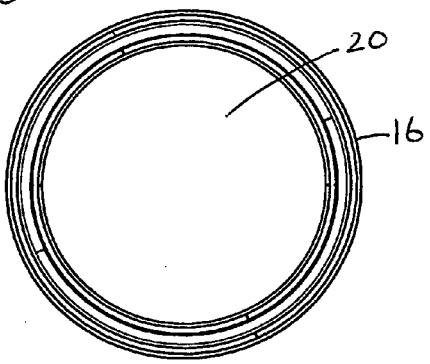
tion.

7. The travel mug according to claim 6, wherein the button portion is dome shaped and extends across the upper body defining a channel between the upper body and the periphery of the button portion.

8. The travel mug according to claim 6, wherein the upper body includes an upwardly extending peripheral wall that extends upwardly from the button defining a cavity between the button and the peripheral wall.

9. The travel mug according to claim 5, wherein the valve member is releasably attached to the upper body such that the valve member can be removed to facilitate cleaning the upper body.

Figure 3



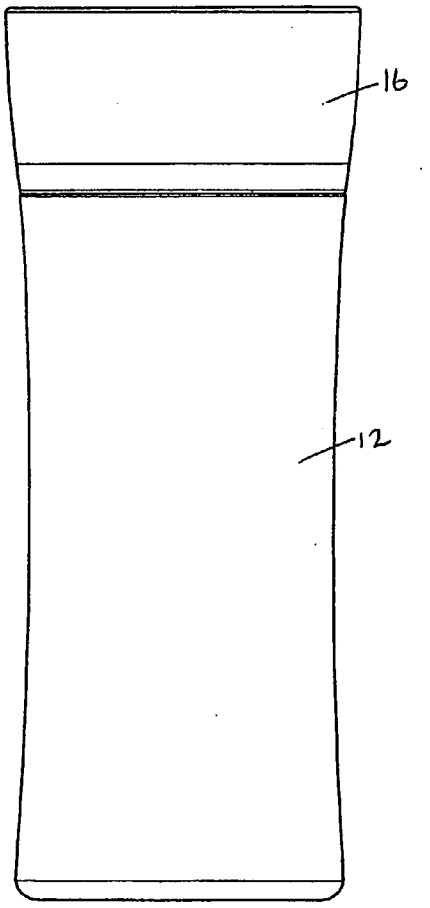


Figure 2

Figure 1

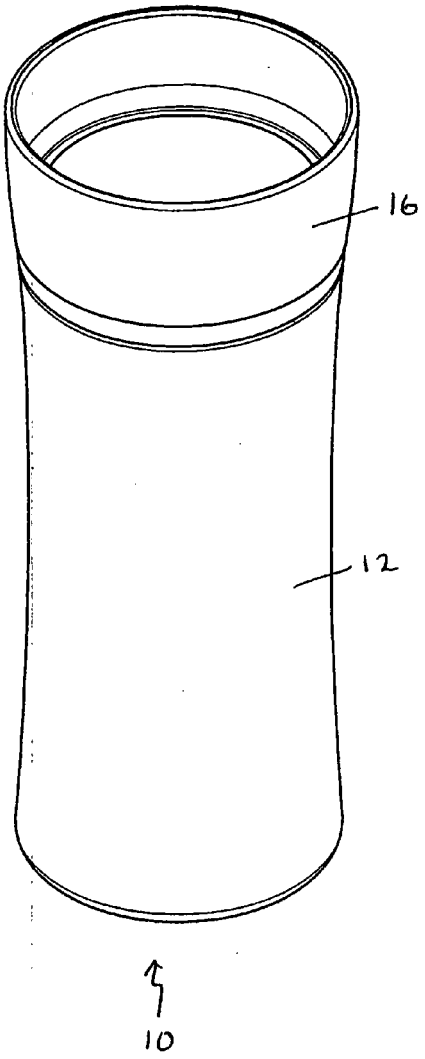
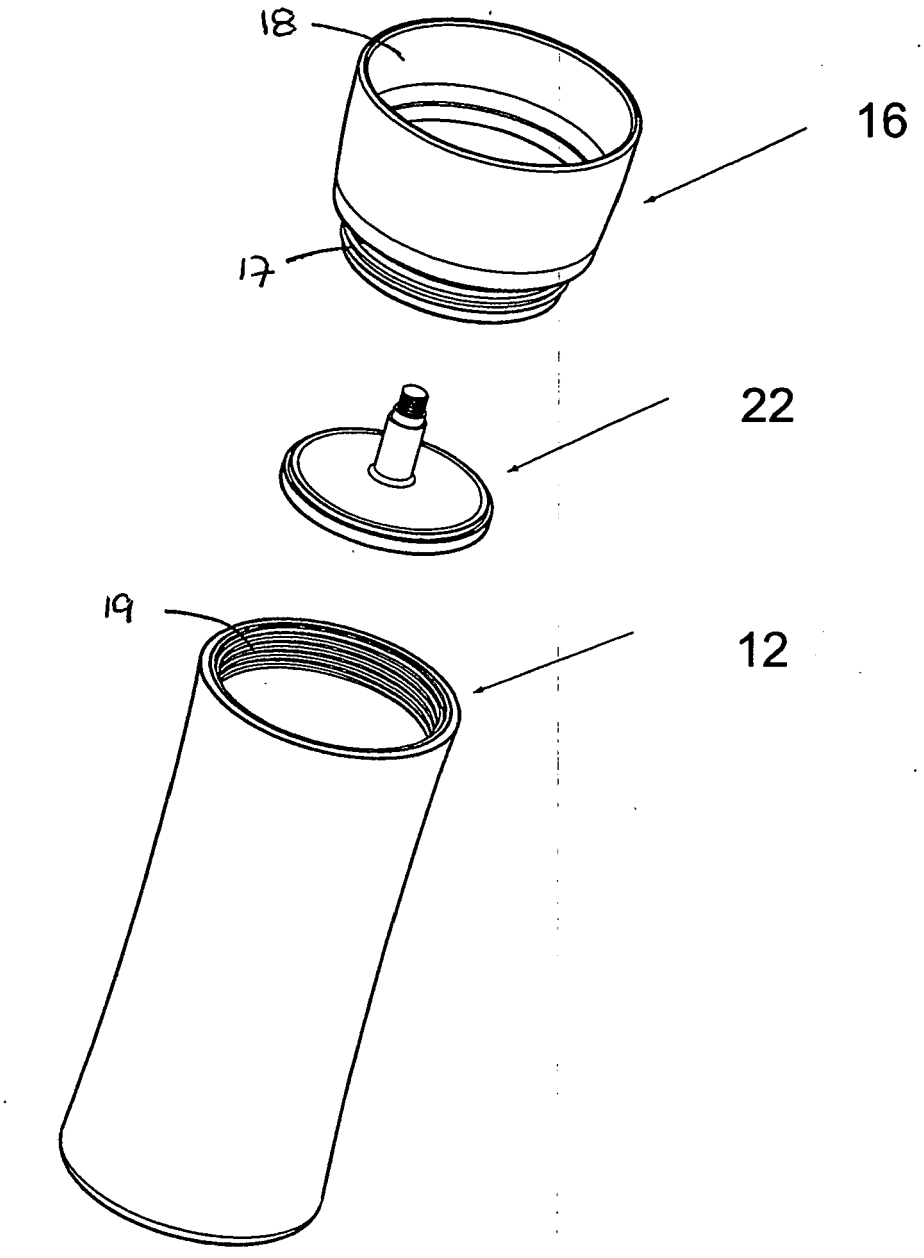


Figure 5



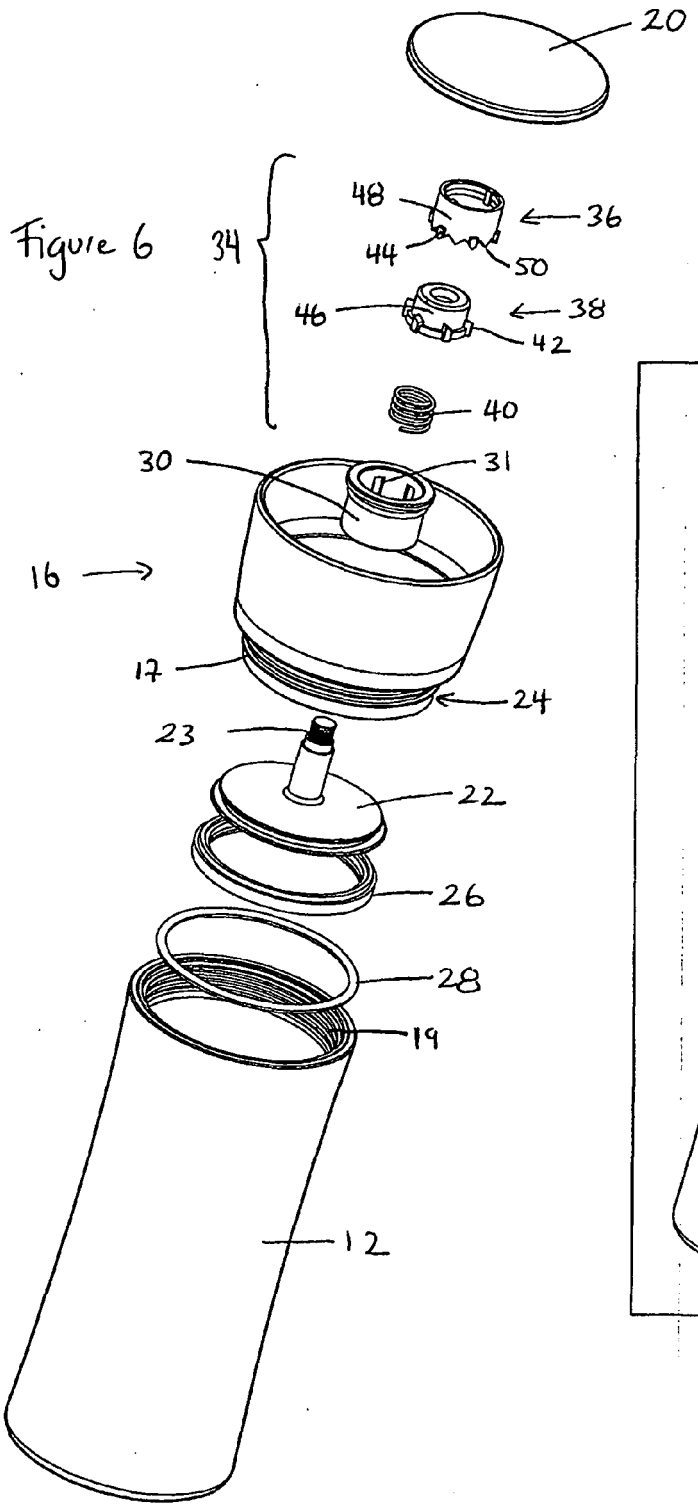


Figure 6

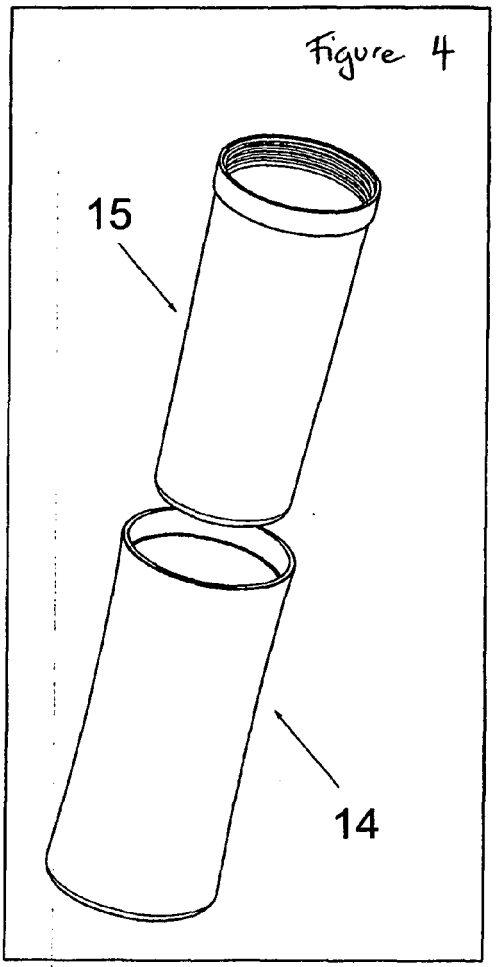


Figure 4

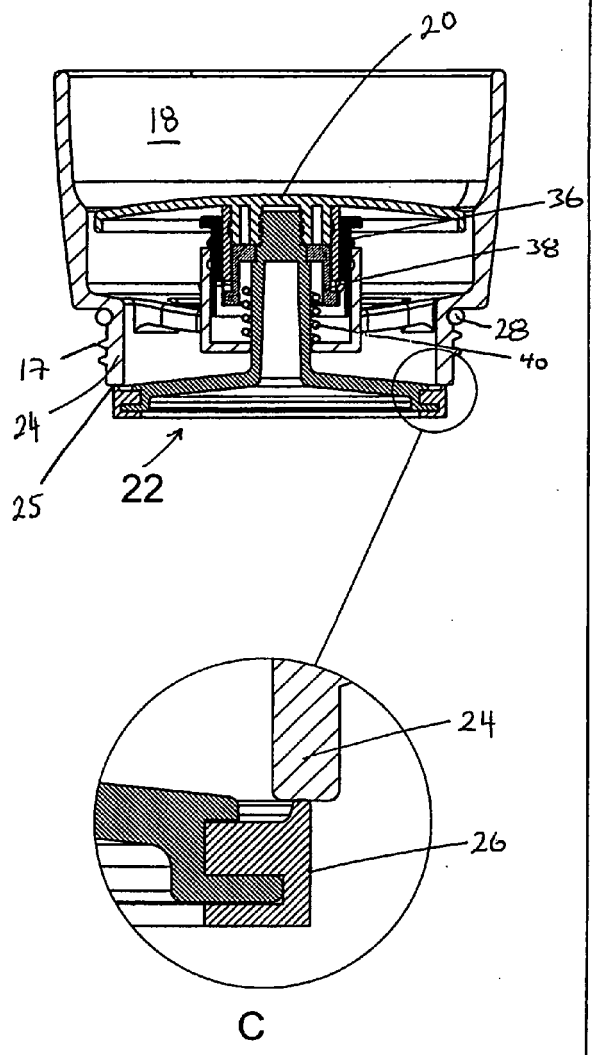


Figure 7

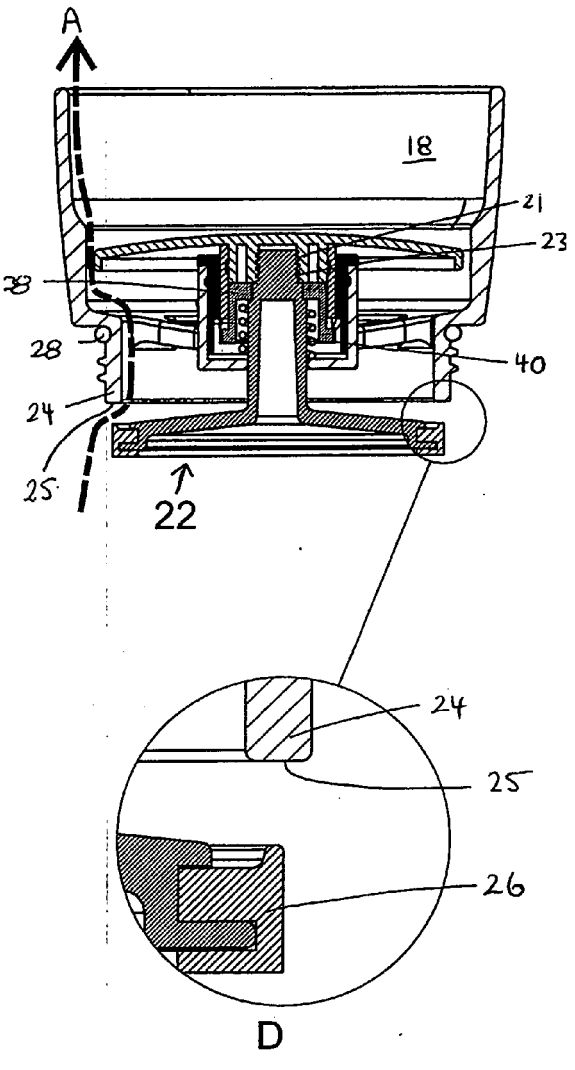


Figure 8

Figure 9

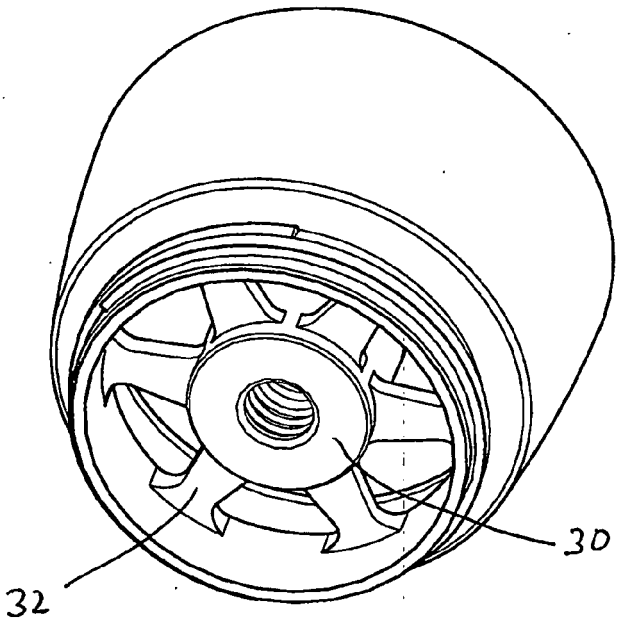


Figure 10