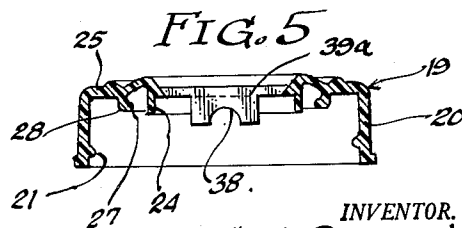
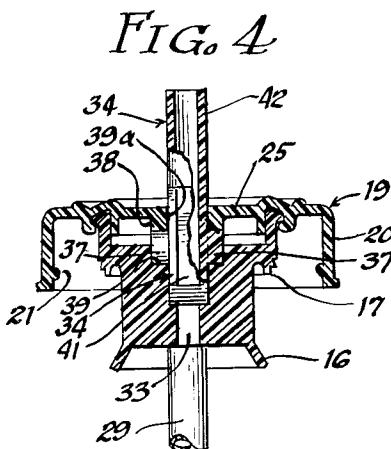
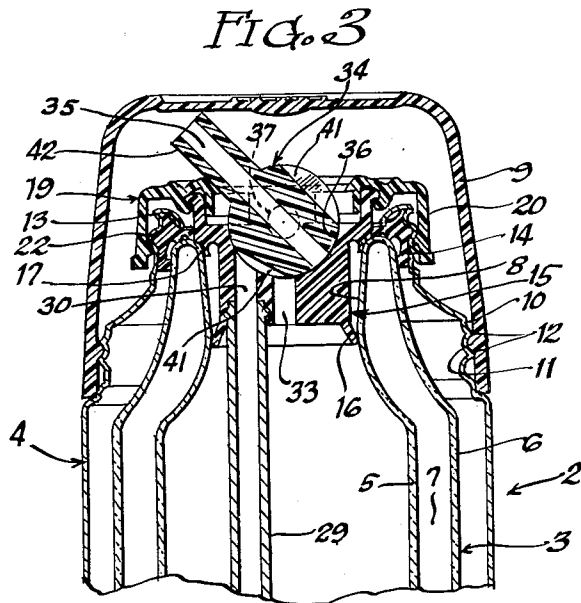
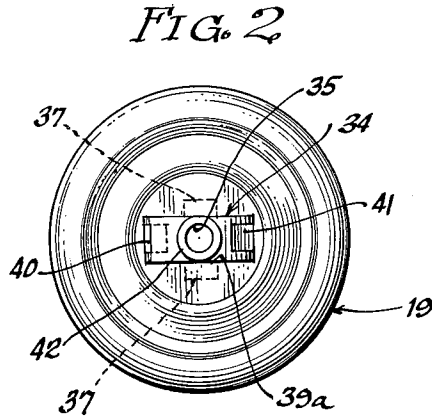
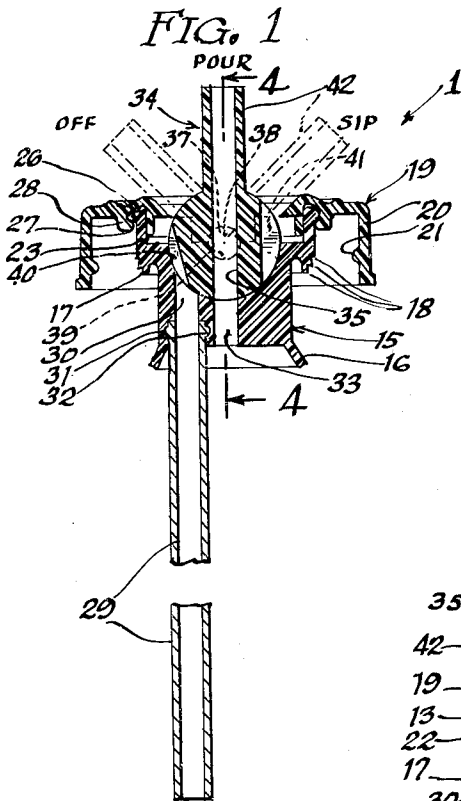


April 11, 1961

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SIP-THROUGH AND POUR-THROUGH CLOSURE FOR
VACUUM BOTTLES OR THE LIKE
Filed April 15, 1959

2,979,238



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SIP-THROUGH AND POUR-THROUGH CLOSURE FOR VACUUM BOTTLES OR THE LIKE

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Filed Apr. 15, 1959, Ser. No. 806,594

4 Claims. (Cl. 222-484)

This invention relates to closures for vacuum bottles or other receptacles.

One object of the present invention is to provide a closure having a straw or pipe extending downwardly therefrom, a spout extending upwardly for either sipping or pouring liquid out of the vacuum bottle, and a valve arrangement having sipping, pouring and closed positions.

A further object is to provide a closure which may be employed for either sipping or pouring liquid out of the vacuum bottle, without removing the closure from the vacuum bottle.

Another object is to provide a new and improved closure of the foregoing character which is easy to manipulate and low in cost.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

Fig. 1 is an elevational section of a sip-through and pour-through closure to be described as an illustrative embodiment of the present invention, the valve member of the closure being in its pouring position.

Fig. 2 is a top view of the closure.

Fig. 3 is an elevational section showing the closure mounted on a vacuum bottle, the valve member of the closure being in its closed position.

Fig. 4 is an elevational section taken generally along a line 4-4 in Fig. 1.

Fig. 5 is a sectional view taken through the upper component of the closure.

It will be seen that the drawings illustrate a closure 1, adapted to be used in connection with a vacuum bottle 2. Of course, the closure may actually be employed in connection with any suitable receptacle. The illustrated vacuum bottle 2 is of the usual type, having a vacuum insulated filler or receptacle 3, received with a protective jacket 4. As shown, the filler 3 has inner and outer walls 5 and 6, with an evacuated space 7 therebetween. An opening or mouth 8 is formed in the upper end of the filler 3.

An inverted cup 9 may be employed to cover the upper end of the vacuum bottle 2. Of course, the cup 9 is also useful in drinking the contents of the vacuum bottle. It will be seen that the jacket has a reduced upper portion 10 adapted to receive the cup 9. Internal threads 11 are formed on the cup 9 for screw engagement with external threads 12 on the jacket 4.

In this case, the upper end of the jacket 4 is formed into an outwardly projecting, annular pouring lip 13, which may be of the type disclosed and claimed in my Patent No. 2,832,392, issued April 29, 1958.

An annular sealing ring or gasket 14 is interposed between the upper end of the jacket 4 and the filler 3 to prevent any liquid from leaking between the filler and the jacket. The gasket 14 may be made of a soft resilient material, such as rubber or a suitable plastic.

Certain features of the closure 1 are disclosed and claimed in my co-pending application, Serial No. 715,025, filed February 13, 1958, now Patent No. 2,934,231.

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However, the closure 1 is specially constructed to provide for sipping or pouring out the liquid contents of the vacuum bottle.

In general, the closure 1 comprises a stopper 15 adapted to be inserted into the mouth 8 of the filler 3. At its lower end, the stopper 15 has an outwardly and downwardly slanting skirt-like flange 16 adapted to form a primary seal with the inside of mouth 8. Near its upper end, the stopper 15 has a depending flange 17 adapted to engage the mouth 8 near the top of the filler 3, to form a secondary seal. Annular serrations 18 are formed on the outside of the flange 17 to insure a perfect seal. The stopper 15 may be made of a soft resilient material, which may be rubber, but preferably is a tasteless, odorless plastic, such as polyethylene.

The upper end of the stopper 15 is connected to a ring or cap 19 which is employed to secure the closure 1 to the vacuum bottle.

Thus, the outer portion of the ring 19 takes the form of a depending flange or rim 20. Internal threads 21 are formed on the flange 20 and are adapted to be screwed onto external threads 22 formed on the jacket 3 near its upper end.

The stopper 15 is secured to the ring 19 in the manner disclosed and claimed in my co-pending application, Serial No. 715,025, filed February 13, 1958, now Patent No. 2,934,231. Thus, the upper end of the stopper 15 takes the form of a cylindrical flange 23. A depending flange 24 is formed on the ring 19 and is adapted to be snugly received within the flange 23. The ring 19 has an annular top wall 25 which extends between the flanges 20 and 24.

An outwardly projecting annular bead 26 is formed on the upper end of the cylindrical flange 23. It will be seen from Fig. 1 that the bead 26 is adapted to interlock with an inwardly projecting bead or flange 27 on the ring 19. The bead 27 projects inwardly from the lower end of a depending flange 28. The closure 1 is assembled by pushing the stopper 15 upwardly into the ring 19, until the bead 26 snaps past the bead 27. The interlocking beads retain the stopper 15 in the ring 19 and prevent any relative movement between the stopper and the ring.

It will be seen that a hollow pipe or tube 29 extends downwardly from the stopper 15. The pipe 29 may be made of any suitable material, such as aluminum or various plastics. The length of the tube 29 is such that it extends very nearly to the bottom of the filler 3. Thus, the tube 29 is adapted to serve as a straw, through which liquid may be sucked from the vacuum bottle.

As shown, the upper end of the tube 29 is connected to a passage or opening 30 extending upwardly through the stopper 15. The lower end of the passage 30 may be enlarged to receive the tube 29. Any suitable means may be employed to secure the tube 29 to the stopper. In this case, the upper end of the tube 29 is formed with an outwardly projecting bead 31, to interlock with a groove 32 formed in the lower end of the passage 30.

A second passage 33 extends upwardly through the stopper 15 from the lower end thereof. For sipping and pouring, one of the passages 30 and 33 is employed to carry liquid out of the vacuum bottle, while the other passage carries air into the vacuum bottle to prevent a partial vacuum from developing therein.

To control the passage of liquid out of the vacuum bottle, a valve member 34 is movably mounted on the upper end of the stopper 15. In this case, the valve member 34 is movable to an off position, a pouring position, and a sipping position, indicated by appropriate legends in Fig. 1. A primary valve passage 35 extends through the valve member 34. In its off position as shown in Fig. 3, the valve member 34 closes the upper

ends of both passages 30 and 33, so that neither of them is in communication with the valve passage 35. In the pouring position, the valve passage 35 registers with the passage 33. When the valve member 34 is moved to the sipping position, the valve passage 35 registers with the passage 30 and thus is connected to the tube 29. In this case, the valve member 34 is rotatable, and hence is circular in cross-section. As shown, the valve member 34 is generally cylindrical in shape and is fitted into a cylindrically curved seat 36 formed in the upper end of the stopper 15. The upper ends of the passages 30 and 33 extend into the seat 36 for communication with the valve passage 35.

The opposite ends of the illustrated valve member 34 are formed with pivots 37, which are rotatably retained between upper and lower bearing blocks 38 and 39, formed integrally with the ring 19 and the stopper 15 respectively. As shown to best advantage in Figs. 4 and 5, the upper bearing blocks 38 project downwardly from the top wall 25 of the ring 19. The upper portion of the valve member 34 projects upwardly through a slot 39a formed in the top wall 25.

The valve member 34 is arranged to admit air to the filler 3 in both the pouring and sipping positions of the valve member. For this purpose, the valve member 34 is formed with channels or grooves 40 and 41 in its outer surface, on opposite sides of the valve passage 35. In the pouring position, as shown in Fig. 1, the channel 40 forms a connection between the upper end of the passage 30 and the atmosphere above the closure 1. In the sipping position, the channel 41 provides communication between the passage 33 and the atmosphere. In the off position, the channel 40 happens to be opposite both passages 30 and 33, but there is no communication between either of the passages and the atmosphere.

For use in both pouring and sipping, a hollow spout or mouthpiece 42 is connected to the valve passage 35. As shown, the mouthpiece 42 takes the form of a tube extending upwardly from the valve member 34. It will be apparent that the mouthpiece 42 forms a convenient handle or lever for swinging the valve member to any of its three positions. The length of the mouthpiece 42 is such that it may easily be placed in the mouth so that liquid may be sipped out of the vacuum bottle. However, the mouthpiece is short enough so that it will fit under the inverted cup 9, as shown in Fig. 3.

The vacuum bottle is filled by removing the entire closure 1, so that milk, coffee or other liquid may be poured into the vacuum bottle. The closure 1 is then inserted into the filler 3 and is secured to the vacuum bottle by screwing the threads 21 onto the jacket threads 22. The vacuum bottle is carried with the spout or mouthpiece 42 in its off position, so that no liquid can escape through the passages 30 and 33.

Liquid may be poured from the vacuum bottle by moving the spout 42 to its pouring position, shown in Fig. 1. The vacuum bottle is then inverted so that the liquid will flow outwardly through the passage 33, the valve passage 35, and the spout 42. Air enters the vacuum bottle through the channel 40, the passage 30, and the tube 29.

Liquid may be sipped or sucked out of the vacuum bottle by moving the spout 42 to its sipping position, placing the spout 42 in the mouth, and applying suction so as to draw liquid upwardly through the tube 29, the passage 30, the valve passage 35, and the spout 42. In this case, air is admitted to the filler 3 through the channel 41 and the passage 33.

It will be apparent that closure 1 is extremely easy to use, because liquid may be either sipped or poured out of the vacuum bottle without removing the closure. If the vacuum bottle is accidentally tipped over, little or no liquid will spill from the vacuum bottle, because of the small size of the valve passage. Thus, the closure is quite suitable for use by children, who are apt to tip over the vacuum bottle quite frequently.

Both the stopper and the rotatable valve member may be made of plastic materials, such as polyethylene, which are easily washed and which do not take up odors or flavors from liquids that may be carried in the vacuum bottle. Thus, the closure can easily be kept sanitary. Despite its high degree of usefulness and versatility, the sip-through closure may be easily manufactured and sold at low cost.

Various modifications, alternative constructions and equivalents may be employed without departing from the spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claims.

I claim:

1. In a closure for vacuum bottles or the like, the combination comprising a stopper adapted to be received in the mouth of a vacuum bottle, said stopper having first and second passages extending between the top and bottom thereof, an elongated tube connected to the lower end of said first passage and adapted to extend downwardly into the liquid contained in the vacuum bottle, a generally cylindrical valve member rotatably mounted in the upper end of said stopper, said stopper having a cylindrically curved seat for receiving said valve member, said first and second passages being connected at the upper ends to first and second ports spaced along said cylindrically curved seat, said valve member having an upwardly extending stem thereon with a valve passage extending therethrough, said valve member being rotatable between a first position with said valve passage connected to said first port, a second position with said valve passage connected to said second port, and a third position with said valve passage closed off at its lower end by the blind wall of said seat, said valve member having first and second channels thereon, said first channel being disposed to afford communication between said first port and the atmosphere above said stopper when said valve member is in said second position, so as to admit air to said first port and thereby provide for pouring out the contents of the vacuum bottle through said second passage and said valve passage, said second channel being disposed to afford communication between said second port and the atmosphere when said valve member is in said first position, so as to admit air to the vacuum bottle through said second passage when the contents of the vacuum bottle is sipped out of the vacuum bottle through said first passage and said valve passage by the application of suction to said stem.

2. In a closure, the combination comprising a stopper, a hollow pipe extending downwardly from said stopper, a first opening extending upwardly in said stopper from the upper end of said pipe, a second opening extending upwardly in said stopper from the lower end thereof, a valve member movable in said stopper between sipping, pouring and closed positions, said valve member having a valve passage therein registering with said first opening in said sipping position and with said second opening in said pouring position, a hollow spout connected to said valve passage for carrying liquid outwardly through said second opening and said spout when said valve member is in said pouring position, said spout being usable as a mouthpiece to draw liquid upwardly by suction through said pipe when said valve member is in said sipping position, said first and second openings being closed to the atmosphere by said valve member when said member is in its closed position, valve passage means on said valve member and movable into registration with said second opening for connecting said second opening to the atmosphere to admit air when said valve member is in said sipping position, and valve passage means on said valve member and movable into registration with said first opening for connecting said first opening to the atmosphere to admit air when said member is in said pouring position.

3. In a closure, the combination comprising a stopper, a hollow pipe extending downwardly from said stopper,

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a first opening extending upwardly in said stopper from the upper end of said pipe, a second opening extending upwardly in said stopper from the lower end thereof, a valve member movable in said stopper between sipping, pouring and closed positions, said valve member having a valve passage therein registering with said first opening in said sipping position and with said second opening in said pouring position, a hollow spout connected to said valve passage for carrying liquid outwardly through said second opening and said spout when said valve member is in said pouring position, said spout being usable as a mouthpiece to draw liquid upwardly by suction through said pipe when said valve member is in said sipping position, said first and second openings being closed to the atmosphere by said valve member when said member is in its closed position, a channel in said valve member for connecting said second opening to the atmosphere to admit air when said valve member is in said sipping position, and a channel in said valve member for connecting said first opening to the atmosphere to admit air when said valve member is in said pouring position.

4. In a closure for vacuum bottles or the like, the combination comprising a stopper adapted to be received in the mouth of a vacuum bottle, said stopper having first and second passages extending between the top and bottom thereof, an elongated tube connected to the lower end of said first passage and adapted to extend downwardly into the liquid contained in the vacuum bottle, a generally cylindrical valve member rotatably mounted in the upper end of said stopper, said stopper having a cylindrically curved seat for receiving said valve member,

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said first and second passages being connected at their upper ends to spaced points along said cylindrically curved seat, said valve member having an upwardly extending stem thereon with a valve passage extending therethrough, said valve member being rotatable between a first position with said valve passage connected to said first passage, a second position with said valve passage connected to said second passage, and a third position with said first and second passages closed off by said valve member, said valve member having first and second channels thereon, said first channel being disposed to afford communication between said first passage and the atmosphere above said stopper when said valve member is in said second position, so as to admit air to said first passage and thereby provide for pouring out the contents of the vacuum bottle through said second passage and said valve passage, said second channel being disposed to afford communication between said second passage and the atmosphere when said valve member is in said first position, so as to admit air to the vacuum bottle through said second passage when liquid is sipped out of the vacuum bottle through said first passage and said valve passage by the application of suction to said stem.

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