Oct. 31, 1939. C. E. VOKE 2,177,758

CLOSURE

Filed Feb. 10, 1937

Fig. 1

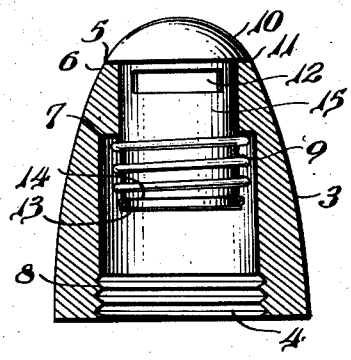


Fig. 2

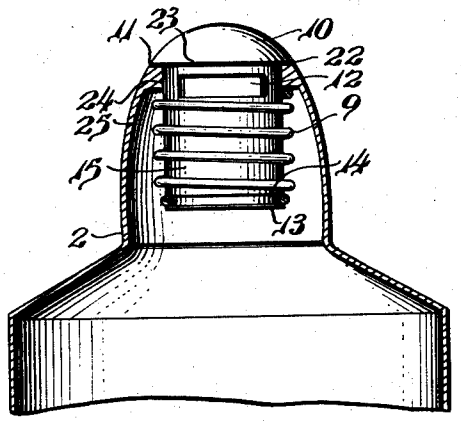


Fig. 3

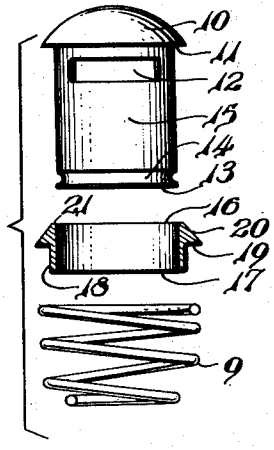
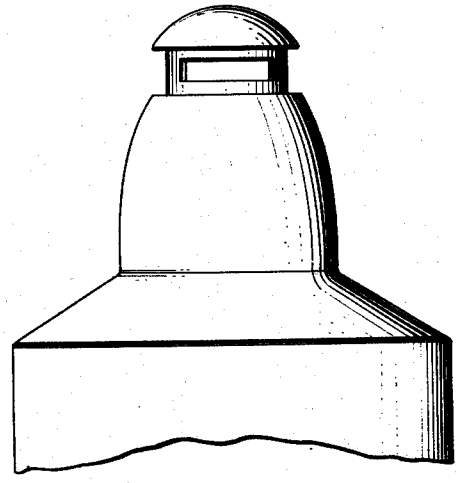


Fig. 4



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CLOSURE

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6 Claims. (Cl. 221—60)

The invention relates to closures. It has to do, more particularly, with automatic closures for use with containers of the collapsible type, such as those used for tooth pastes, shaving creams, ointments and similar products, although it is not necessarily limited thereto.

One of the objects of the invention is to provide a closure for containers of the type indicated which may either be made as a separate unit from the container and applied to it, or as a unit made as a permanent part of the container.

Another object of the invention is to provide a closure for containers of the type indicated which is made of a minimum number of simple parts, economical for production, efficient in operation and sanitary in use since there are no ridges or crevices on the outside surface for materials to collect and dry. Another object of the invention is to provide a closure for containers of the type indicated that will automatically open and dispense by pressure on the container and will automatically close when such pressure is removed.

Another object of the invention is to provide a closure for containers of the type indicated that will keep the container sealed at all times except when material is being dispensed.

In its preferred form, my invention contemplates the provision of a closure which is automatically operative to open or close the container. This closure preferably comprises a cylinder which acts as a plunger and which is adapted to fit freely slidable in the neck of the container, or either in a provided collar or shell which is mounted on the container. This cylinder is provided with an open lower end and a closed upper end. A discharge opening is formed in the side wall of the cylinder near its upper end. A spring is mounted in surrounding relation to the cylinder at its lower end and is adapted to return the cylinder to its lowermost and original position after the pressure which has caused it to move upwardly has been released. The preferred embodiment of my invention is shown in the accompanying drawing wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a view, partly in section, of the closure device with the plunger mounted in a screw shell which is adapted to be applied to the container.

Figure 2 is a cross section view of the closure mounted in the neck of a container.

Figure 3 is a cross section view of the closure showing the parts with the plunger to be mounted in a collar member.

Figure 4 shows a view of the closure in its open position.

With reference to the drawing, I have shown a container 1 which is of the collapsible type, provided with a neck portion 2 in which or on which the closure device is adapted to be mounted.

The closure device comprises a cylinder 15 which has an open lower end 13 and a closed upper end 10. A flange 11 is formed near the upper end of the cylinder and the cylinder is further provided with an opening 12 which is formed in one side thereof, near its upper end. At its lower end, the cylinder is provided with a groove or flange 14 formed thereon. Although I have shown the plunger to be cylindrical in shape, it is understood that the plunger may be oval, square or any other desired shape.

In reference to Figure 1, I have provided a shell unit 3 which has an open upper end 5 which forms a collar, in which the cylinder 15 is adapted to reciprocate and an open lower end 4. The lower inside periphery of the shell is provided with threads 8 for attaching the closure to the neck of the container. Although threads are shown as the means for attaching the closure to the container, it is understood that any other means may be employed. The shell is further provided with a shoulder 7 formed on the inside periphery near its upper end. A spring 9 is mounted in surrounding relation to the lower end of the cylinder and this spring has its lower end abutting the flange 14 and its upper end abutting shoulder 7. The flange 11 will seat on the top edge 6 of the shell when the cylinder is in its normal and lowermost position. In operation of this closure device, pressure is applied to the container which causes the material to flow up into the cylinder 15 and will exert a pressure on the under surface of the closed end 10. This will move the cylinder upwardly until the opening 12 has passed the upper end of shell 3 and will allow the material to be dispensed. As soon as the pressure on the container has been removed, the spring 9 which has been compressed by the upward movement of the cylinder will again expand and immediately return the cylinder 15 to its original position and will shut off the flow of material from the container.

In Figure 2, I have shown the cylinder mounted in the especially constructed neck 2 of collapsible tube 1. This neck is provided with an opening 23 formed in its upper end and walls 24 of the opening are relatively thick, to form a guide for the cylinder 15. A shoulder 25 is formed immediately below said opening. The cylinder 15 is adapted to fit freely slidable in the opening 23 so that when the cylinder is in its lowermost and normal position, the flange 11 will seat on the top edge 22 of the neck 2. A spring 9 is mounted in surrounding relation to the bottom portion of the cylinder having its upper end abutting against the shoulder 25 and its lower end abutting against the flange 14 of the cylinder. It can be readily seen that this form of

closure operates in the same manner as described of Figure 1.

In Figure 3, I have shown a collar 20 with an open upper end 16 and an open lower end 17. This collar is further provided with its lower outside periphery 18 of slightly less diameter than the neck opening of the tube so that the collar may be positioned inside the neck of a tube. It is understood that in as much as collapsible tubes are made of soft metal, a friction tight fit is sufficient to hold the collar 20 sufficiently attached to the inside of the tube. However, if necessary, it is understood that grooves or threads may be used for attaching the collar in place. A shoulder 19 is also formed on the outside periphery of the collar so that when it is in position in the neck of a tube, the shoulder 19 will rest on the top edge of the neck to prevent the collar from receding into the neck. The cylinder 15 is adapted to be mounted in the collar 20 in such a manner that it is freely slidable therein. When the cylinder is in its original and lowermost position, the flange 11 will rest on the top edge 21 of the collar. A spring 9 is mounted in surrounding relation to the lower portion of cylinder 15 and has its upper end abutting against the base of collar 20 and its lower end abutting against the flange 14. It can also be readily seen that this form of closure operates in the same manner as described above. It can further be seen that this form of closure eliminates the process of threading the neck of the tube.

From the description above, it will be readily seen that I have produced a novel form of closure. It will further be seen that the closure may either be made as a separate unit from the container or as a permanent part of the container. It will further be seen that the closure is made with a minimum number of parts, economical for production, efficient in operation and sanitary. It will be further seen that the closure is automatically operative and that the container will be sealed at all times except when material is being dispensed.

Having thus described my invention, what I claim is:

1. A closure for collapsible tubes and the like, comprising a plunger having an open lower end and a closed top, a collar having a flange formed on its upper outside periphery, means for yieldingly holding said plunger in its lowermost position and for returning said plunger to said lowermost position after pressure on the tube which caused it to move upwardly has been released, the closure being made and assembled independently from the tube and adapted to fit in the neck portion of the tube.

2. A closure for collapsible tubes and the like, comprising a hollow plunger having a closed top, an opening formed in one of the walls of said plunger, a collar having a flange formed on its upper outside periphery, means for yieldingly holding said plunger in its lowermost and normal position and for returning said plunger to said lowermost position after pressure on the tube which caused it to move upwardly has been released, the closure being made and assembled independently from the tube and adapted to fit on the neck portion of the tube.

3. A closure for collapsible tubes and the like, comprising a hollow cylinder having a closed top, a flange formed near the upper end of said cylinder, a collar in which the cylinder is slidably fitted, said collar having a flange formed on its outside periphery, said flange on the collar being adapted to rest on the top edge of the neck of an associated tube, the lower outside surface of said collar being adapted to fit tightly within the neck of the tube, said cylinder having an opening formed in its wall below the said flange, said opening serving as a discharge opening when the top thereof is disposed above the top of said collar, an indenture formed with said cylinder adjacent to its base, and a spring seated at its lower end on said indenture, the top of said spring abutting against the lower surface of said collar, the entire closure being made and assembled independently from the tube.

4. A closure for collapsible containers or the like comprising a collar member, a hollow plunger mounted in said collar member in such a manner that it may reciprocate therein, said hollow plunger having an open lower end and a closed upper end, an opening formed in one side of said plunger, means for limiting the lowermost position of said plunger, a spring member adapted to normally maintain said plunger in its lowermost position, all of the parts of said closure being combined as a separate unit which is placed as a whole on the neck of said container, means for securing said closure to the neck of said container, said plunger being movable upwardly to dispose the said opening above the upper edge of said collar to allow the contents of said container to discharge from said opening when pressure is applied to said collapsible container, and said spring being adapted to return said plunger to its normal position with the opening disposed within said collar when such pressure on the walls of said container is released to stop discharge of the contents of said container.

5. In a self contained closure unit for a tube, a collar; a plunger adapted to reciprocate in the collar, said plunger having an opening formed therethrough, said opening being closed by the wall of the collar when the plunger is in its lowermost position and opened when the plunger is raised from said lowermost position; and resilient means disposed between the collar and plunger for biasing the plunger to the said one position, said collar being adapted to be frictionally engaged inside the neck portion of the tube.

6. A self contained closure for a tube comprising a collar adapted for attachment to a tube, the upper surface of said collar forming a seat, a plunger in the collar and having a flange at the top thereof adapted to rest on said seat, said plunger being open at the bottom and closed at the top and having an opening in the side thereof, said opening being closed by the wall of the collar when the plunger is in its lowermost position and open when the plunger is raised, the interior wall of the collar providing the sole guide for the plunger, the bottom of the plunger having a groove providing a shoulder, and a spring interposed between a lower part of the collar and the shoulder in the plunger and biased to force the upper flange upon the seat.

CARL EDWARD VOKE.