April 14, 1936. J. LEFFERT 2,037,172

SNAP CAP CLOSURE

Filed May 20, 1935

Fig. 1.

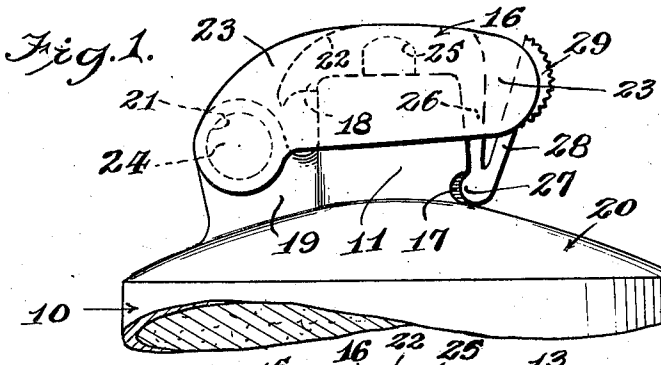


Fig. 2.

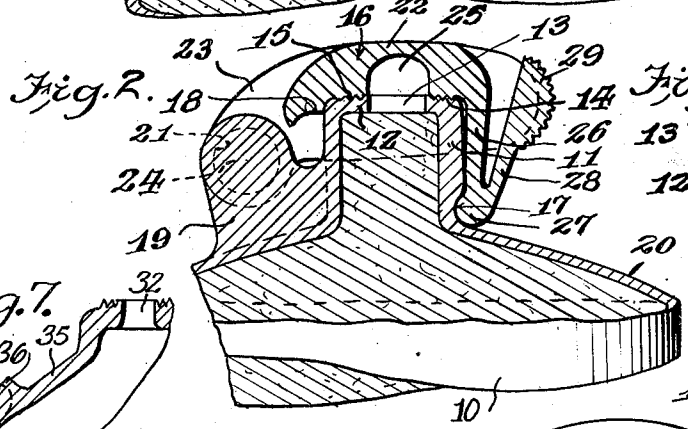


Fig. 5.

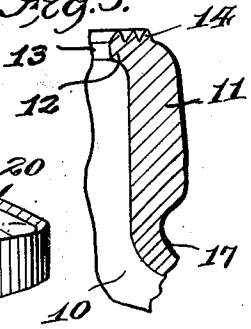


Fig. 7.

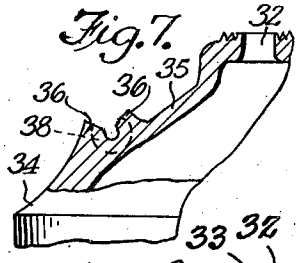


Fig. 3.

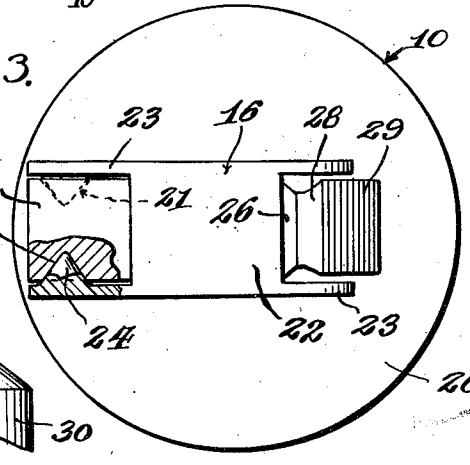


Fig. 6.

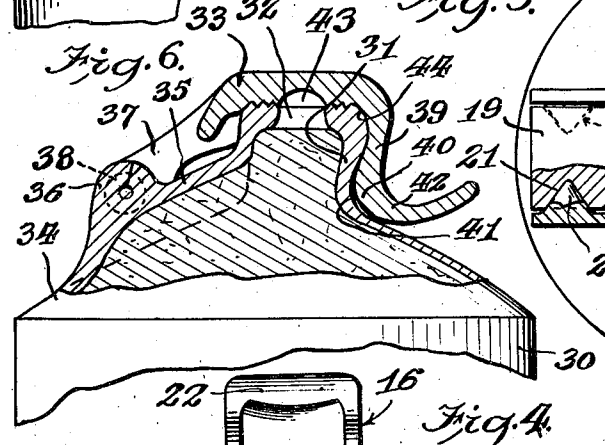
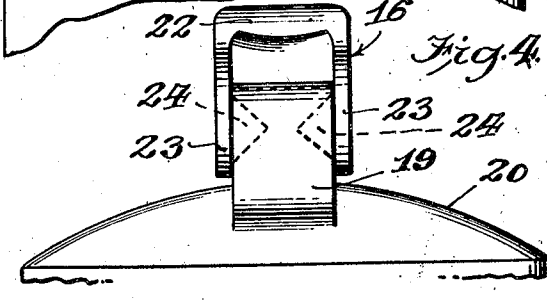


Fig. 4.



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Patented Apr. 14, 1936 2,037,172

UNITED STATES PATENT OFFICE

2,037,172

SNAP CAP CLOSURE

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Application May 20, 1935, Serial No. 22,452

6 Claims. (Cl. 221—60)

My invention relates to collapsible tubes and closures therefor, and it consists in the constructions, arrangements and combinations herein described and claimed.

It is an object of the invention to provide a tube and closure structure which will provide an effective seal against leakage, without the use of a gasket.

It is also an object of the invention to provide a closure which will prevent loss of any of the contents of the tube upon closing of the closure cap.

It is a still further object of the invention to provide an anchorage means for the closure cap of such nature that the cap will retain its alignment with the tube nozzle, even after extended use.

Additional objects, advantages, and features of invention will be apparent from the following description and accompanying drawing, wherein

Figure 1 is a fragmentary portion of a tube and closure constructed in accordance with my invention.

Figure 2 is a vertical section thereof, a portion of the tube being shown in elevation.

Figure 3 is a top plan view of Figure 1, slightly reduced, a portion being broken away, illustrating the mounting of the closure cap.

Figure 4 is a rear elevation of Figure 1.

Figure 5 is a detail sectional view of the neck of the container.

Figure 6 is a view similar to Figure 2 illustrating a modified construction of cap and anchorage stud.

Figure 7 is a fragmentary sectional view illustrating one stage of formation anchorage stud shown in Figure 6.

Attention is first invited to Figures 1 to 5 of the drawing, wherein I have shown a collapsible tube 10 having an integrally formed neck 11. The neck 11 may have any desired shape and terminates in an inwardly turned annular flange 12 defining an axial dispensing orifice 13. The flange 12 is formed with a plurality of circumscribing ridges and valleys 14 upon its upper face, which cooperate with similar ridges and valleys 15 formed in the closure 16, these ridges and valleys functioning to effect a leak-proof closure, as will be described in greater detail hereinafter.

Adjacent the juncture of the neck 11 and the tube 10, a depression 17 is provided, extending a short distance around the neck, and may be formed in the neck by approved stamping operations. As shown, a lug 19 is formed at a point diametrically opposite the depression 17 and projects above the inclined wall 20 of the tube, and in opposed faces of the lug conically shaped sockets 21 are formed.

The closure 16 comprises a body 22 from which a pair of side plates 23 project forwardly and rearwardly, the function of which will be presently described. The body 22 stops short of the rear ends of the plates 23 to provide ample clearance for the anchorage lug 19, and the width of the body 22 is such that the plate members 23 will be spaced so as to snugly straddle the lug 19. Adjacent the rear ends of the plates 23 and upon their inner opposed faces, conical projections 24 are formed, adapted to seat in respective sockets 21.

Upon the under side of the body 22 a chamber 25 is formed, substantially the same size as the discharge orifice 13, and when the cap is in closed position the chamber is in alignment therewith, as may be seen in Figure 2. It will be noted that the ridges and valleys 15 circumscribe the chamber 25 and are adapted to register with the valleys and ridges 14 previously described. It should also be noted that the body 22 at a rear portion thereof is formed with a shoulder 18 spaced so as to snugly seat upon the side of the upper end of the neck 11.

The body 22 further includes a downwardly extended flexible leg 26 disposed between the forward ends of the plates 23, the lower end of the leg being inclined slightly with respect to the outer wall of the neck 11. The inner face of the leg 26 has formed thereon an enlargement or bill 27, adapted to engage with the groove 17 of the neck, and an arm 28 is integrally connected with the leg 26 adjacent the bill 27. The arm 28 is free at its upper end and is movable between the forward ends of the plates 23, and preferably the outer face of the arm is provided with a serrated head 29, thereby affording a suitable gripping surface.

With the cap in closed position, it will be seen that by virtue of the registered ridges and valleys an effective seal is provided against leakage of contents of the tube, and further, by provision of the chamber 25 an air space is established directly over the discharge orifice, so that liability of creating a suction through the discharge orifice 13, when opening the closure cap is avoided, thereby precluding waste of material from the tube. Also the chamber 25 will accommodate excess of the contents of the tube, if discharged from the orifice 13.

From the foregoing, it will be seen that a snap-

action closure is provided, the cap being held in closed position by virtue of engagement of the bill 27 with the groove 17, and to effect release of the bill 27 to open the closure, it is only necessary to exert an inward pressure upon the head 29 which will produce an outward flexing of the leg 26. To close the cap, it is only necessary to exert a downward pressure upon the body 22 until the bill snaps into the groove 17. The rearwardly extending portions of the plates 23 are laterally flexible, and as may be noted, during closing action of the closure, the bill 27 will first have bearing contact with the forward wall of the neck 11, exerting a pull in a horizontal plane tending to slide the projections a slight distance out of the conical socket 21 against the lateral tension of the plates 23, but as soon as the bill 27 has been seated in the recess 17, the projections 24 will be snugly forced into their respective sockets and retained therein by the resilient action of the plates 23. By the construction thus provided, the closure may readily adjust itself to the neck, and also wear between the projections 24 and sockets 21 will be automatically taken up, so that a snug fitting closure is provided, regardless of the length of usage.

In Figure 6 I have illustrated a modified construction of cap and its manner of mounting, and attention is now directed to this figure, wherein the tube is illustrated by the reference character 30 and with which there is integrally formed a neck 31, having a discharge orifice 32. The cap 33 and the upper planiform face of the neck 31 include registering ridges and valleys, as described in the first form of the device. The top wall 34 of the tube has a portion 35 raised approximately to a point intermediate the height of the neck 31, and at the rear of this raised portion 35, a split loop 36 is formed. The loop 36 is formed as a strap member, the ends of which may be readily bent toward and snugly contacting each other, and the outer side faces of which are formed to provide the conical sockets, as described in the first form of the device.

The cap 33 comprises a pair of plates 37, spaced and of a length so as to straddle the loop 36 with the cones 38 in seated engagement with respective sockets, and the opposite end of the cap has a downward extension 39 adjacent the base of which an enlarged bill 40 is formed so positioned as to have snap contact with a groove 41 formed at the base of the neck 31. The extension 39 terminates in a curved finger grip 42. This form of the device includes an air chamber 43 as previously described and preferably the neck 31 is formed with a rounded edge 44, and the under face of the cap is similarly formed so that a snug fit between the cap and neck is established.

While I have shown and described preferred constructions of my tube and cap, I am well aware that modifications may be readily made, and I therefore consider as my own, all such variations as fairly fall within the scope of the appended claims.

I claim:—

1. In a container and closure, a neck having an inturned flange defining a discharge orifice, said flange having upstanding ridges circumscribing the orifice, a closure cap hingedly mounted upon the container and swingable to a position over the discharge orifice, said cap having ridges complemental to the first named ridges, and releasable fastening means between the cap and the container.

2. In a container and closure, a neck having an inturned flange defining a discharge orifice, said flange having upstanding ridges circumscribing the orifice, a closure cap hingedly mounted upon the container and swingable to a position over the discharge orifice, an air space in the cap aligned with the discharge orifice when the cap is in closed position, said cap further having ridges complemental to the first named ridges, and releasable fastening means between the cap and container.

3. In a container and closure, a neck on the container having an inturned flange defining a discharge orifice, an upstanding lug on the container, said lug having oppositely disposed recesses, a closure hingedly mounted in the recesses and swingable to a position over the discharge orifice, an air space in the cap adapted to register with the discharge orifice, a groove formed in the neck of the container, a resilient leg member on the closure, said leg having a lip for locking engagement with the groove, and finger-actuated means for springing the leg to release the lip from the groove.

4. In a container and closure, said container having a neck including a discharge orifice, an upstanding recessed lug on the container, a closure for the discharge orifice, said closure comprising a pair of plate members spaced to receive the lug therebetween, a conical bearing member on each of the plates and journalled in the respective recesses of the lug, a body member formed between the plates, a recess in the body member adapted to align with the discharge orifice, said body having a downwardly extended resilient leg member and an upwardly and outwardly extended arm member, a groove formed in the neck of the container, and said leg member having a lip for snap engagement with the groove.

5. In a container and closure, said container having a neck including a discharge orifice, an upstanding recessed lug on the container, a closure for the discharge orifice, said closure comprising a pair of plate members spaced to receive the lug therebetween, a conical bearing member on each of the plates and journalled in the respective recesses of the lug, a body member formed between the plates, a recess in the body member adapted to align with the discharge orifice, said body having a downwardly extended resilient leg member and an upwardly and outwardly extended arm member, said arm member having a serrated head member, a groove formed in the neck of the container, said leg member having a lip for snap engagement with the groove, and said plate members substantially overlapping said leg and arm members.

6. In a container and closure, the container having a neck including a discharge orifice, a lug on the container having oppositely disposed conical sockets, a cap, said cap having seating engagement with the neck for closing the discharge orifice, a pair of laterally flexible plate members on the cap, said plates being of a length to straddle the lug, each plate having a conical-shaped bearing for seating engagement in the respective conical sockets, a leg member on the cap, said leg member having camming action with a portion of the neck, whereby to shift the cap to permit adjustment of the cap to the neck, said neck having a groove, and said leg having means engageable with the groove for holding the cap in closed position.

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