

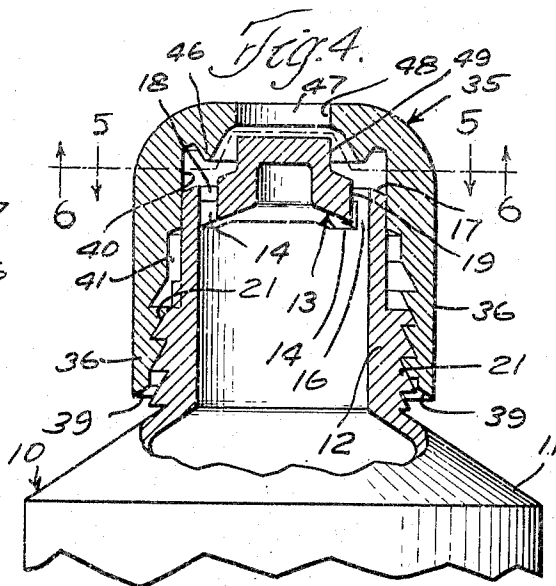
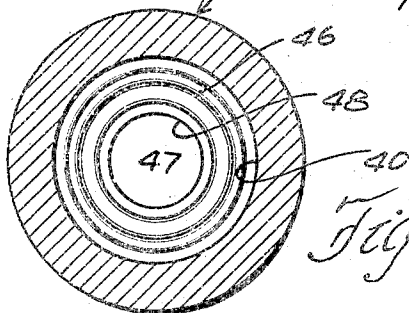
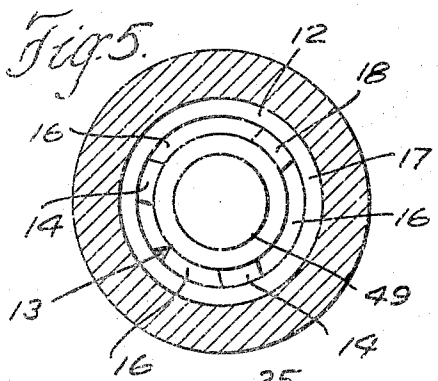
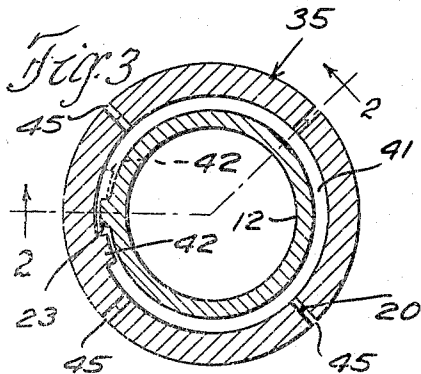
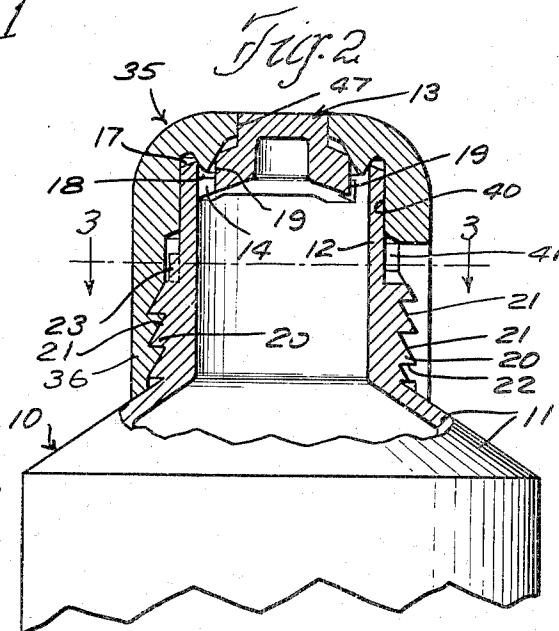
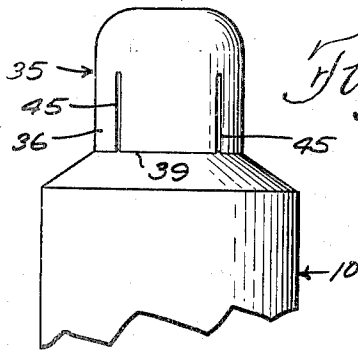
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SNAP-ON DISPENSING CLOSURE FOR COLLAPSIBLE TUBES

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SNAP-ON DISPENSING CLOSURE FOR
COLLAPSIBLE TUBES

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1 Claim. (Cl. 222-499)

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This invention relates to snap-on dispensing closures for collapsible tube containers and has for an object to provide a closure which is non-removable, but which may be assembled by the usual assembly methods.

Another object is to provide a closure of the above type having novel and improved operating characteristics.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

The novel features which are characteristic of this invention will be better understood by referring to the following description, taken in connection with the accompanying drawing in which a specific embodiment thereof has been set forth for purposes of illustration.

In the drawing:

Fig. 1 is a side elevation of a portion of a collapsible tube container showing my improved closure applied thereto;

Fig. 2 is a longitudinal section taken on the line 2-2 of Fig. 3 showing the tube and cap of Fig. 1 on a larger scale;

Fig. 3 is a transverse section taken on the line 3-3 of Fig. 2;

Fig. 4 is a longitudinal section similar to Fig. 2 showing the cap in open position; and

Figs. 5 and 6 are transverse sections taken on the line 5-5 and 6-6 of Fig. 4 and looking respectively in the directions of the arrows.

Referring to the drawings more in detail, the invention is shown as applied to a tube 10 which represents a portion of a collapsible tube container of the type commonly used for toothpaste, shaving cream, etc. Such tubes are commonly made of a thin metal which is readily deformed by pressing for the extrusion of the material therefrom. As indicated in Figs. 2 and 4, the tube is provided with a head comprising a flared skirt 11 of relatively thick material so as to impart rigidity and a cylindrical neck 12 through which the contents are extruded. The neck 12 terminates in an end closure 13 which is joined thereto by means of spacers 14 to form a plurality of arcuate slots 16 extending around the closure 13. The top surfaces of the spacers 14 are depressed below the end 17 of the cylindrical neck portion 12 to form annular channels 18 between the inner surface of the cylindrical neck portion 12 and the outer surface 19 of the closure 13.

The cylindrical neck portion 12 is also provided near its base with external threads 20, which, as shown in Figs. 2 and 4, are saw-toothed in cross

section having sloping upper surfaces 21 and substantially horizontal lower surfaces 22. A lug 23 extends upwardly above the threads 20 adjacent the outer surface of the cylindrical neck portion 12.

The closure cap 35 is provided with a skirt 36 having saw-tooth teeth 37 conforming in shape to the teeth 20 of the cylindrical neck portion 12 and having inclined lower surfaces and substantially horizontal upper surfaces. The lower end of the skirt is provided with an inclined surface 39 adapted to bear against the skirt 11 of the tube when the cap is in closed position. The cap 35 is provided with a cylindrical inner surface 40 adapted to register with the outer surface of the cylindrical neck portion 12 and with an annular recess 41 above the upper thread 37 to provide clearance for receiving the lug 23 above mentioned. A positioning lug 42 (Fig. 3) is formed on the cap 35 in the recess 41 and is adapted to engage the lug 23 of the cylindrical neck portion 12 of the tube for limiting the turning movement of the cap 35 to slightly less than one revolution. The lower portion of the cap skirt is provided with a plurality of longitudinal slits 45 to provide resilience to permit the cap to be snapped in place over the threads 20. The upper portion of the cap is provided with a wedge-shaped annular flange 46 which is adapted to seat in the groove 18 and in the recesses 16 between the top of the cylindrical neck portion 12 and the inner surface 19 of the end closure 13 so as to seal the arcuate discharge openings 16 when the cap is seated. The cap is also provided with a central aperture 47 having a cylindrical wall 48 which fits over a cylindrical wall 49 of the end closure 13 for closing the tube when the cap is in closed position, as shown in Fig. 2. When the cap is elevated, however, as shown in Fig. 4, a sufficient space is provided between the under surface of the cap and the outer surface 49 of the end closure for the passage of material therethrough.

In the assembly of this device the cap is pushed axially onto the cylindrical neck portion 12 of the tube with a sufficient pressure to cause the inclined surfaces of the cap threads to cam out over the inclined surfaces 21 of the tube threads and thereby spread the cap skirt sufficiently to pass the threads, the slots 45 providing resilience for this purpose.

When the cap has been seated to within one thread of its ultimate closed position, it may be turned until completely closed. The cooperating lugs 23 and 42, however, prevent the cap from

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being unscrewed more than a complete turn and the cooperating horizontal surfaces of the respective threads eliminate any spreading force on the cap skirt due to the screwing up of the cap. Hence the cap may be tightly closed without any tendency to jump a thread. If desired the mating thread surfaces, instead of being horizontal, may be undercut so as to cause the pressure due to the screwing of the cap into position to cause the skirt to be drawn in toward the axis and to thereby grip the threads tightly.

The top edge of the lug 23 and the lower edge of the lug 42 may be tapered if desired for ease of assembly so that the cap will automatically be turned to bring the lugs out of alignment so that they can pass each other should the cap be initially positioned with the lugs in alignment. If in assembly it should happen that the lug 42 of the cap should engage the lug 23 of the tube to prevent the cap from being tightened sufficiently, it is only necessary to unscrew the cap a complete turn and then push the cap downwardly over an additional thread until it seats.

The above mentioned cap is preferably cast in a single piece from a plastic composition, although it may be made of metal if desired. Plastic is preferred, however, because of its moldability and pleasing appearance.

Although an embodiment of the invention has been shown for purposes of illustration, it is obvious that the invention may be applied to various uses and that changes and modifications may be made therein as will be apparent to a person skilled in the art.

What is claimed is:

In a collapsible tube container, a neck having a threaded exterior surface and an end closure member, a plurality of arcuate discharge openings in said end closure member, a cap having a skirt with internal threads to engage said first threads, said cap having a central axial discharge opening, said end closure member being adapted to enter said last opening for closing the

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same when the cap is screwed into place, and an annular wedge-shaped flange formed on the under surface of said cap adapted to close said arcuate discharge openings when said cap is in closed position, said thread having a pitch to open or close said last opening in response to less than 360° rotation of said cap and stop lugs formed on said neck and said cap to limit the rotation of the cap to less than 360°, the top surface of the neck lug and the bottom surface of the cap lug being tapered to prevent registration when the cap is snapped into place, said skirt being provided with vertical slits to provide resilience to permit the threaded skirt to be snapped into place over the threaded neck, said threads being saw-toothed in section and having inclined surfaces for camming the skirt over the threads when the cap is snapped into place and horizontal surfaces for resisting the removal of said cap, and eliminating any radial thrust due to the tightening of the cap on said neck.

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