

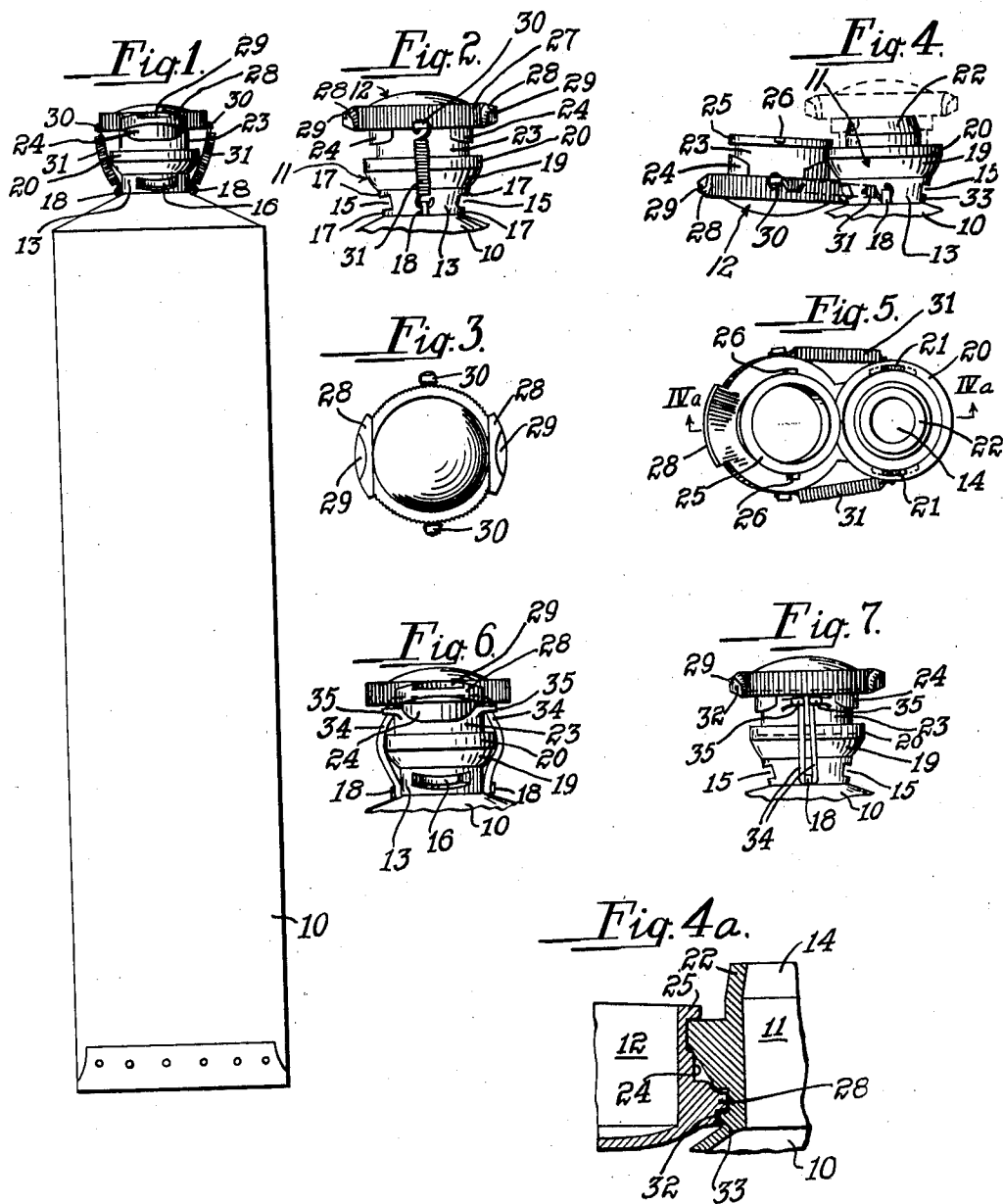
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CONTAINER CAP CONSTRUCTION

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## UNITED STATES PATENT OFFICE

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## CONTAINER CAP CONSTRUCTION

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My invention relates to a cap construction for containers, such as those commonly known as collapsible tubes, and more particularly to such a container cap construction which normally is not detached from the container and which is adapted to be locked on the container either in container-closing or container-opening position.

Containers such as tubes for holding tooth-pastes, creams, and various other toilet preparations are commonly provided with caps which merely screw on and off. The defects and disadvantages of such caps are too well known to require particular discussion. Some attempts have been made to provide caps which are inseparable under conditions of usage from the container but such have proved to be either too expensive or too unsatisfactory or complicated with the result that the industry has gone back to the ordinary screw cap type with minor variations in size, material and configuration. The fact that the art has reverted in general to the ordinary screw cap indicates clearly that the proposed non-detachable caps were unsatisfactory for general usage, but it is well known that the art has long desired a simple, inexpensive and fool-proof non-detachable cap which will overcome the defects and disadvantages hitherto accepted of necessity.

It is an object of the present invention to provide a container cap having the above indicated advantages without the concomitant disadvantages of complexity, undue expense or inconvenience.

Another object of my invention is to provide so-called collapsible tubes with a new and superior cap construction which is adapted to be locked in either tube-closing or tube-opening position and which can not become separated from the container accidentally.

Another object of my invention is the provision of a container cap for collapsible tubes which cannot be inadvertently or accidentally opened by contact with various objects as when one or more of the tubes are packed away for traveling purposes.

A still further object of my invention resides in providing a cap for collapsible tubes and the like which is swingable from tube-closing to tube-opening position and vice versa without danger of the cap becoming detached from the tube and while constantly subjecting the cap to a force urging it always toward the container.

A still further object of my invention comprises a container cap which so cooperates with the underlying container portion that it can be locked in either open or closed position by a simple move-

ment requiring no appreciable amount of force.

Other and further objects and advantages reside in the specific details of construction to be hereinafter pointed out where they are not apparent.

In the accompanying drawing:

Figure 1 illustrates a vertical elevation of a collapsible container provided with a preferred embodiment of the present invention;

Fig. 2 is a view of the present invention at right angles to Fig. 1, but on a larger scale and showing only a fragmentary portion of the associated container;

Fig. 3 is a plan view of Fig. 2;

Fig. 4 is a view of Fig. 2 with the container cap in open position, the closed position of the cap being indicated by the dotted line construction;

Fig. 4a is a fragmentary vertical sectional view taken on the line IVa—IVa of Fig. 5;

Fig. 5 is a plan view of Fig. 4;

Fig. 6 is a vertical elevational view similar to Fig. 1, but illustrating another embodiment of the invention; and

Fig. 7 is a view at right angles to Fig. 6 and bearing the same relationship thereto as Fig. 2 bears to Fig. 1.

Similar numerals identify corresponding parts throughout the various views of the drawing.

The numeral 10 indicates a collapsible container or tube of any preferred or desired type. This container per se is so well known that it requires no particular description. In general it consists of some relatively bendable metal which can be readily collapsed to discharge the desired amount of the contents thereof and is ordinarily collapsed from the bottom upward, the material of the container being rolled as the material is displaced from the tube. Instead, however, of providing such a tube with the ordinary screw-threaded base for the reception of a threaded cap, I provide an entirely different construction as will now be pointed out in detail.

My invention comprises in general a lower portion 11 which is suitably associated with the conical upper end of the container and a cap portion proper 12 adapted to close the lower portion or to be moved to a position which opens the lower portion for displacement of material from the container. Hereinafter I will refer to the position in which the cap closes the container, as in Figs. 1 and 2, as the closed or closing position, and the position in which the container is open for displacement of material, as in Figs. 4 and 5, as the open or opening position. The two portions, that is, lower portion 11 and cap portion

proper 12 are preferably made of castings of any suitable metal or other material which is available for the present purposes, for example, hard rubber, bakelite, lead, aluminum, steel, iron, or any combination thereof.

It will be observed that the lower portion 11 is provided with a more or less straight or slightly tapered collar portion 13 adjacent to and connecting with the interior of the container. The portion 11 has a central aperture 14 giving communication to the interior of the container and the collar portion 13 is provided with diametrically opposite recesses 15 of the approximate shape and configuration clearly shown in Figs. 1 and 2. These recesses are preferably disposed at a slightly acute angle to the horizontal and are arcuate as is apparent. The recesses, of course, do not extend entirely through the thickness of the collar portion as will be apparent from Figs. 1 and 6, wherein the numeral 16 indicates the metal at the bottom of the recess.

It will be noted further that these recesses are provided with sharp shoulders 17 the purpose of which will become apparent hereinafter. Said collar portion is also provided with suitable lugs or hooks 18 diametrically oppositely disposed. Above said collar portion is the upwardly flaring portion 19 which may terminate in an annular portion 20. The portion 20 is provided on its upper surface with diametrically opposite cut-away portions or cutouts 21 as will be clearly understood from Fig. 5 and these cutouts are extended for a distance into the portion 20 but below the surface thereof on either side of the cutouts 21 thereby forming short arcuate channels at those points. Above the annular portion 20 the lower portion 11 terminates in a discharge orifice 22 which may be of the shape shown or other suitable shape and from which the material contained in the tube is expelled.

The cap portion proper designated by the numeral 12 is provided with a central cylindrical portion 23 on which are diametrically oppositely provided the projections 24, the under edges of which are curved cam-like. At the lower end of the cylindrical portion 12 is the annular shoulder or ridge 25 which is of rectangular cross section, and diametrically oppositely extending from said shoulder or ridge are the hooks or lugs 26. Above the cylindrical portion 23 is the milled head 27 of the cap and this milled head is provided with diametrically opposite arcuate extensions 28 as shown. These extensions are in general convex on their peripheries and concavo-convex when viewed horizontally as is clearly apparent from Figs. 1, 2 and 3, but the upper surfaces of the extensions are provided with reverse arcuate cutouts 29 which extend for only a portion of the thickness of the extensions as is clearly indicated in Fig. 3 wherein the bottom surface bounding the cutouts 29 indicates metal. The milled head portion is also provided with diametrically opposite hooks or lugs 30 similar to those numbered 18 described in connection with the lower portion 11. A suitable cork or other sealing disk (not shown) may be disposed in the cap in known manner.

As is apparent from Figs. 1 to 5, inclusive, spring members 31 are disposed between the lugs 18 and the lugs 30 of such a size and strength as to exert a suitable constant force on the cap urging it toward the lower portion and this is true whether the cap is in open or in closed position. Such springs may be made of brass, stainless steel, or other suitable metal or alloy.

It is, therefore, apparent that the cap portion 12 may be swung to and from open and closed position and in either position is relatively rigidly maintained in relation to the lower portion 11. For example, when the cap is closed as in Figs. 1 and 2 the annular shoulder or ridge 25 fits within the annular portion 20 of the lower portion 11 and the lugs 26 on such shoulder or ridge pass into the cutouts 21 in the portion 20. The cap may then be twisted slightly either clockwise or counter-clockwise until the lugs 26 pass into the under-cut arcuate channels adjoining cutouts 21 thereby locking the cap in closed position.

Again when the cap is moved from the position of Fig. 2 to the position of Fig. 4, the reverse angular movement is carried out and then the cap is swung over either to the left or to the right indiscriminately through an arc of about 90° in which position annular shoulder or ridge 25 hangs upon annular portion 20, which is held between members 24 and 25, and the adjacent extension 28 on the cap fits into the contiguous recess 15 in the lower portion as is shown in Fig. 4. Due to the cutouts 29 in the extensions 28 and due to the sharp shoulders 17 bounding the recesses 15 the cap member is securely and relatively rigidly maintained in a locked condition in open position. The relationship is more clearly apparent from Fig. 4a and abutting surfaces 32 and 33 enhance the stabilizing effect of the positioning of the parts. The construction and arrangement are such that only slight forces need be exerted upon the cap either to open or to close the container and the springs always exert a force upon the cap urging it toward the lower portion 11.

As shown in Figs. 6 and 7, I may modify the construction above described somewhat so as to enable the use of an elastic holding element such as a suitable rubber band 34 in place of the springs 31. When this is done I provide on the cylindrical portion 23 of the cap the opposed sets of diametrically oppositely disposed hooks or lugs 35 in place of the lugs 30 on the milled head. I use a continuous elastic band of suitable length and strength which passes around under the milled head of the cap over one of the opposed sets of hooks or lugs 35, down to and around the lug or hook 18 on the lower portion 11 and then up parallel with the downwardly extending portion over the other of the opposed hooks 35 and around to the other side, which is provided with the same construction and arrangement as will be clearly apparent by a comparison of Figs. 6 and 7.

I have thus provided a container cap which cannot be accidentally displaced either in open or in closed position and which is characterized by a high degree of flexibility of operation so as not to hamper to any appreciable extent the convenient and rapid use of the container or tube.

Other and further modifications and variations which will occur to those skilled in this art are intended to be included within the above description which is accordingly presented as illustrative rather than limitative, the scope thereof being determinable by the subjoined claims. I may, for example, make portions 11 and 12 of suitable non-metallic materials such as those well known for ordinary screw caps now in use. I may, moreover, apply the present invention to other types or kinds of containers wherever the principles of the present invention find advantageous application. I am not, consequently, limited to collapsible tubes or containers which have been

used for purposes of illustration and explanation.

What I claim as new and desire to secure by Letters Patent is:

1. A container cap construction comprising a lower portion associated with the container and a cap-portion proper, said cap-portion proper being swingable in either direction between a position opening said container and a position closing said container, said portions being provided with one set of interengaging means to releasably hold them in container-closing position and with an additional set of interengaging means to releasably hold them in container-opening position.
2. A container cap construction comprising a lower portion associated with the container and a cap-portion proper, said cap-portion proper being swingable between a position opening said container and a position closing said container, said portions being provided with interengaging means to releasably hold them in container-closing position and with additional interengaging means to releasably hold them in container-opening position, said first interengaging means including lugs on said cap portion and undercut arcuate cutouts on said lower portion.
3. A container cap construction comprising a lower portion associated with the container and a cap-portion proper, said cap-portion proper being swingable between a position opening said container and a position closing said container, said portions being provided with interengaging means to releasably hold them in container-closing position and with additional interengaging means to releasably hold them in container-opening position, said second interengaging means including projections on said cap portion and recesses in said lower portion.
4. A container cap construction comprising a lower portion associated with the container and a cap-portion proper, said cap-portion proper being swingable between a position opening said container and a position closing said container, said portions being provided with interengaging means to releasably hold them in container-closing position and with additional interengaging means to releasably hold them in container-opening position, said first interengaging means including lugs on said cap portion and undercut arcuate cutouts on said lower portion, said second interengaging means including projections on said cap portion and recesses in said lower portion, and resilient means always urging said cap portion toward said lower portion regardless of the relative positions of the two.
5. A container cap construction comprising a lower portion associated with the container and a cap portion proper, each of said portions being formed with a plurality of sets of interengaging means so constructed and arranged that the said portions are releasably securable to each other in container-opening position and container-closing position, said cap portion being always under the influence of means urging it toward said lower portion.
6. In a structure of the class described, a container, a portion associated with the discharge end thereof, said portion comprising a collar portion, provided with diametrically opposite recesses, lugs on said collar portion diametrically disposed intermediate said recesses, an upwardly flaring portion superjacent said collar portion and terminating in an annular portion, which is provided on its upper surface with diametrically opposite channels, and a discharge orifice superjacent said upwardly flaring portion and communicating with said container.
7. In a structure of the class described, a cap portion, said cap portion comprising a central cylindrical portion, cam-like projections diametrically oppositely disposed on said central cylindrical portion at the upper end thereof, an annular shoulder of rectangular cross-section subjacent said central cylindrical portion and provided with lugs diametrically oppositely disposed, and a milled head superjacent said central cylindrical portion which is provided with diametrically oppositely disposed pairs of extensions and lugs.
8. In a structure of the class described, a container, a portion associated with the discharge end thereof, said portion comprising a collar portion, provided with diametrically opposite recesses, lugs on said collar portion diametrically disposed intermediate said recesses, an upwardly flaring portion superjacent said collar portion and terminating in an annular portion, which is provided on its upper surface with diametrically opposite channels, and a discharge orifice superjacent said upwardly flaring portion and communicating with said container, a cap portion, said cap portion comprising a central cylindrical portion, cam-like projections diametrically oppositely disposed on said central cylindrical portion at the upper end thereof, an annular shoulder of rectangular cross-section subjacent said central cylindrical portion and provided with lugs diametrically oppositely disposed, and a milled head superjacent said central cylindrical portion which is provided with diametrically oppositely disposed pairs of extensions and lugs, a resilient member connected between the lugs on the collar and milled head portions aforesaid always urging said cap portion toward the portion associated with said container, the lugs on the annular portion of the cap being cooperable with the channels in the annular portion of the portion associated with the discharge end of the tube to releasably maintain the cap in tube-closing position, and the extensions on said milled head being cooperable with the recesses on the collar portion to releasably maintain the cap in tube-opening position.
9. A container cap construction comprising a lower portion associated with the container and a cap-portion proper, said lower and cap-portions each being provided with cooperating means for releasably locking them in container-closing position and with other and mechanically independent means for releasably locking them in container-opening position, said cap-portion being also swingable in either direction from container-closing position to container-opening position and being always urged toward said lower portion regardless of its position.
10. A container cap construction comprising a stationary lower portion and a cap-portion proper which is swingable in either direction from container-closing position to container-opening position, each portion being provided with registrable diametrically opposite cooperating means for releasably locking said cap-portion in container-closing position and with registrable diametrically opposite sets of cooperating means mechanically independent of said first means to releasably lock said cap-portion, whichever way it is swung, in container-opening position.

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