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COMBINED DISPENSING CONTAINER AND CLOSURE

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Fig. 1

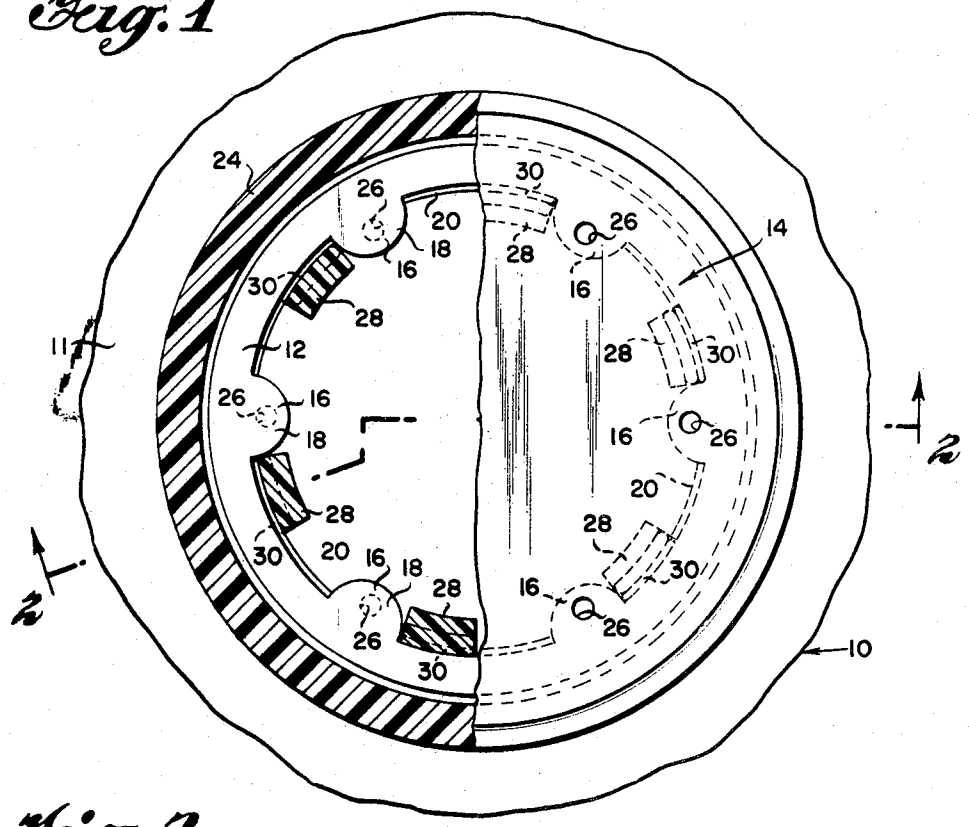
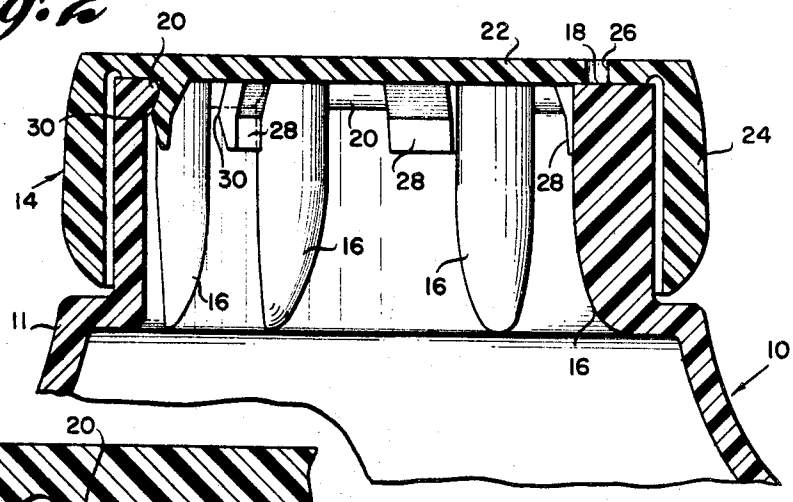


Fig. 2



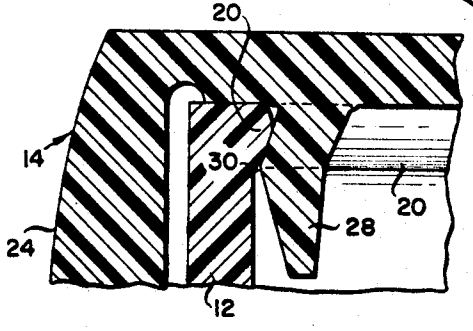


Fig. 3

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COMBINED DISPENSING CONTAINER AND CLOSURE

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ABSTRACT OF THE DISCLOSURE

The present invention relates to a closure assembly for a container provided with spaced lug means formed on an assembly which serve the dual purpose of limiting the rotation of the closure member on the upper end of the neck of the container and which further serve to secure the closure member to the neck by means of a locking bead means formed along the outer circumferential surface of the lug means.

This invention relates to dispensing containers and closures therefor and more particularly to a combined container and closure assembly in which the neck of the container and a one-piece closure cap therefor cooperate to form an effective non-sifting dispensing closure assembly, and in which the closure is held in place on the neck of the container by a novel snap-on construction.

It is an object of this invention to provide a closure assembly for a container in which the upper end or neck portion of the container is so constructed as to cooperate with a relatively movable one-piece dispensing closure cap so as to permit selective opening or closing of the dispensing holes or passages in the closure cap, and in which the closure cap is secured to the neck of the container by a novel snap-on construction.

It is another object of the invention to provide a dispensing container including stop elements or stop lugs carried by the cap member which serve the dual function of limiting the opening and closing movement of the cap member relative to the neck member of the container and also of functioning as locking beads which cooperate with the neck of the container to secure the closure member in position.

It is another object of the invention to provide a new and improved combined container and closure assembly which minimizes any leakage of the contents of the container, particularly during shipment of the container, and which provides a substantially non-sifting leak-proof construction.

In achievement of these objectives, there is provided in accordance with an embodiment of this invention a dispensing container assembly including a container such as a bottle having a special neck finish provided with a plurality of normally vertical circumferentially spaced axial ribs or lugs projecting radially inwardly from the inner surface of the container neck. The closure cap has a plurality of dispensing holes or passages in the top wall thereof, the holes being equal in number to the axial ribs or lugs on the inside of the container neck. The closure cap may be selectively rotated into a dispensing position in which the dispensing holes of the closure cap lie between adjacent axial ribs or lugs of the container neck, or into non-dispensing position in which the dispensing holes of the closure cap lie in superposed frictionally engaged relation to the top surface of the respective axial ribs or lugs of the container neck. In accordance with an important feature of the construction, a plurality of stop lug members depend downwardly from the under surface of the closure cap, the respective stop lugs being positioned in the spaces between adjacent axial ribs of the container neck, the stop lugs serving to limit the

movement of the cap relative to the container neck in opening and closing directions of movement. An important feature of the construction is the fact that the stop lugs which depend downwardly from the under surface of the closure cap are formed to provide locking beads along the outer circumferential surface of the stop lugs, which locking beads cooperate with a locking ring or bead along the inner circumference of the neck finish to secure the closure to the container by means of a snap action.

Further objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a top plan view partially broken away, of a container and closure assembly in accordance with the invention;

FIG. 2 is a view in vertical section taken along line 2—2 of FIG. 1; and

FIG. 3 is a fragmentary enlarged view in vertical section showing the engagement of the closure cap with the container neck.

Referring now to the drawing, there is shown a container generally indicated at **10** such as a bottle, having a main body portion **11** with a hollow interior adapted to be filled with powder or liquid contents. Main body portion **11** of the container terminates in an open upper end defined by an integral upstanding hollow neck generally indicated at **12** which communicates with the hollow interior of the main body portion **11** of the container. A closure cap generally indicated at **14** is adapted to be positioned around and in relatively rotatable relation to neck **12**. The container **10** and the closure cap **14** may be formed of a suitable plastic material or materials or of other suitable material or materials.

The material of either the container **10** or of the closure cap **14** or of both should have some flexibility to facilitate the snap-on sealing engagement between the closure cap and the container neck, as will be hereinafter described. If the container and closure are made of plastic material, the container may be made, for example, of a medium impact polystyrene, while the closure cap may be made of more flexible material such as polypropylene. These materials are merely cited as examples of suitable materials which might be used.

The neck **12** of the container is provided with a plurality of integral, radially inwardly extending normally vertical lugs or ribs **16** which extend in the axial direction of the container in equally circumferentially spaced relation to each other along the inner surface of the container neck. In the illustrated embodiment, six of the ribs **16** are provided, with a spacing apart from each other of 60 degrees between centers. In the illustrated embodiment, each of the ribs **16** is of substantially semi-circular shape in transverse or horizontal cross section, as best seen in the view of FIG. 1. Each rib **16** extends for substantially the entire height of the neck **12** of the container and terminates at its upper end in a flat upper end surface **18**. Although not illustrated in the drawing, if desired a small integral annular sealing bead may extend upwardly from the upper surface of each lug **16** at the same radial distance from the vertical center line of the container assembly as the dispensing holes in the closure cap to be described to provide a frictional sealing engagement around each respective dispensing hole of the closure cap when the closure cap is in closed position.

The container neck in the regions between adjacent vertical ribs **16** is provided at the upper inside edge portion thereof with circumferential bead or locking ring portions or sections **20** which are adapted to be engaged by the downwardly depending stop lugs of the closure cap with a snap-on engagement as will be hereinafter described. The closure cap generally indicated at **14** in-

cludes a top wall 22 and a downwardly depending side wall or skirt 24.

Top wall 22 of closure cap 14 is provided with a plurality of circumferentially spaced dispensing holes 26, the number of dispensing holes 26 being equal in number to the number of ribs 16 on the inner surface of the container neck.

In accordance with an important feature of the construction, closure cap 14 is provided with a plurality of stop lugs each generally indicated at 28 which extend downwardly from the under surface of the top wall 22 of the closure cap. In the illustrated embodiment, a stop lug 28 is provided for the space between each pair of adjacent ribs 16 of the container neck. Thus, since there are six spaces between the six ribs 16 of the container neck in the illustrated embodiment, there are six downwardly depending stop lugs 28. The lugs 28 are positioned at substantially the same radial distance from the center of the cap as are the dispensing holes 26. One function of the stop lugs 28 is to limit the movement of cap 14 in either a closing or an opening direction, the lugs being movable circumferentially in the space between each pair of adjacent lugs on the container neck. The lugs 28 are so located that when the closure cap 14 is moved in an opening direction, the leading edge in the direction of opening movement of each stop lug will abut against a contiguous rib 16 of the container neck at a position in which the dispensing holes 26 are in over-lying relation to the spaces between the adjacent ribs 16 and are thus free to dispense; and in the limiting position in the closing direction of movement of the cap, the leading edge in the closing direction of movement of each stop lug 28 will abut against a contiguous rib 16 of the container neck so that in the limiting position in the closing direction each dispensing hole 26 will be located in overlying relation to the flat upper end surface 18 of one of the ribs 16.

A further important function of the stop lugs 28 is that they are so contoured as to cooperate with the locking ring sections 20 on the inner surface of the container neck to provide a snap action which holds the closure cap in closed position. Thus, as best seen in the views of FIGS. 2 and 3, each stop lug 28 is provided on its radially outer surface with sloping surface contours which define a bead 30. The bead 30 is so dimensioned as to have an outer diameter greater than the inner diameter of the internal circumferential beads 20 of the container neck, thus requiring that the bead 30 defined by the contour of each stop lug 28 be snapped past the corresponding bead section 20 of the container when the closure cap is being placed in position on the container neck.

In using the dispensing container and closure assembly hereinbefore described, after the container 10 has been filled with the desired liquid or powder contents, closure cap 14 is pushed downwardly onto neck 12 of the container, with the beads 30 formed on the stop lugs 28 snapping downwardly past the circumferential bead sections 20 formed on the inner surface of the container neck. The parts are so dimensioned that when the closure cap has been snapped into engagement with the container neck as just described, the under surface of the top wall 22 of the closure cap is drawn down under tension into engagement with the upper surface of the container so that when the closure cap is in closed position the regions around the dispensing holes 26 of the closure cap bear against the upper surfaces 18 of the ribs 16 with sufficient frictional engagement to provide an effective sealing action for holes 26 which prevents leakage of the contents of the container therefrom.

Closure cap 14 is moved to non-dispensing position by rotating the cap in a closing direction to the position shown in FIGS. 1 and 2 in which the dispensing passages 26 of the closure cap are in overlying relation to the vertical ribs of the container neck. The movement of closure cap 14 in the closing direction is limited by the engagement of the leading edge of the respective downwardly depending stop lugs 28 into abutting engagement with the axial ribs 16. The positions of the dispensing holes 26 of the closure cap and of the downwardly depending lugs 28 on the closure cap are so related to each other that when cap 14 has been rotated a sufficient distance to move the stop lugs 28 into stopped engagement with the adjacent neck ribs 16 upon movement of the cap in a closing direction, the dispensing holes will be in overlying relation to the top surfaces 18 of vertical ribs 16.

When it is desired to move the closure cap to dispensing position, the cap is rotated in an opening direction. The maximum opening movement is limited by the engagement of the leading edges of the downwardly depending stop lugs in the opening direction with the contiguous surfaces of the ribs 16, in which position the dispensing holes 26 are located in overlying relation to the spaces between adjacent ribs 16 and are thus free to dispense. With the closure cap in open or dispensing position, the product may be dispensed by inverting the container and shaking.

It can be seen from the foregoing that there is provided in accordance with this invention a container and closure assembly having a new and novel relation between the closure cap and the container neck, in accordance with which the stop lugs carried by the container cap not only serve to limit the movement of the closure cap in opening and closing directions, but further are so contoured as to cooperate with locking bead or ring sections 20 provided on the inner surface of the container neck to provide a snap-on connection of the closure cap to the container neck.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention and, therefore, it is aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What we claim as our invention is:

1. A container and closure assembly comprising a container including an open upper end, a closure cap positioned on said container for movement relative to said open upper end, said open upper end having at least two peripherally spaced lugs extending radially inwardly from the inner surface thereof, said closure cap having at least one dispensing outlet positioned therein, said closure cap being selectively movable in one direction to cause said dispensing outlet to overlie one of said lugs to prevent dispensing of the contents of the container or in the opposite direction to cause said dispensing outlet to lie between adjacent lugs whereby to permit dispensing of the contents of the container, a stop member carried by said closure cap and selectively engageable with one or the other of said peripherally spaced lugs to limit the movement of said closure cap in opening and closing directions of movement, first bead means carried by said stop member formed on the radially outer surface of said stop member, second bead means carried by said container adjacent said open upper end thereof formed on the inner periphery of said open upper end, said first bead means being movable with a snap movement past said second bead means when said closure cap is positioned on said container whereby to hold said closure cap in snapped-on engagement with said container.

2. A container and closure assembly as defined in claim 1 in which said closure cap is rotatably movable relative to said container.

3. A container and closure assembly as defined in claim 1 comprising a container member and a closure member in which at least one of said members is formed of flexible material.

4. A container and closure assembly comprising a container including an open upper end, a closure cap positioned on said container for movement relative to

said open upper end, said open upper end having a plurality of peripherally spaced lugs extending radially inwardly from the inner surface of said open upper end, said closure cap having at least one dispensing outlet positioned therein, said closure cap being selectively movable in one direction to cause said dispensing outlet to overlie one of said lugs to prevent dispensing of the contents of the container or in the opposite direction to cause said dispensing outlet to lie between adjacent lugs whereby to permit dispensing of the contents of the container, a plurality of stop members carried by the under surface of said closure cap, each stop member lying between an adjacent pair of peripherally spaced lugs and selectively engageable with one or the other of said peripherally spaced lugs to limit the movement of said closure cap in opening and closing directions of movement, first bead means formed on the radially outer surface

of said stop members, second bead means formed on the inner periphery of and adjacent said open upper end of said container, said first bead means being movable with a snap movement past said second bead means when said closure cap is positioned on said container whereby to hold said closure cap in snapped-on engagement with said container.

References Cited

UNITED STATES PATENTS

2,985,343	5/1961	Nask	222—555 X
3,186,608	6/1965	Grimsley	222—565 X
3,255,937	6/1966	Jarrett	222—548 X
3,297,214	1/1967	Allen	222—548

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