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3,263,874

CONTAINER CAP HAVING FRANGIBLE SEALING MEANS

Filed Sept. 14, 1964

3 Sheets-Sheet 2

Fig. 6

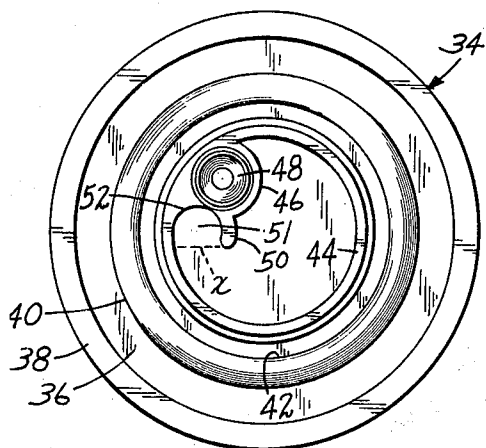


Fig. 7

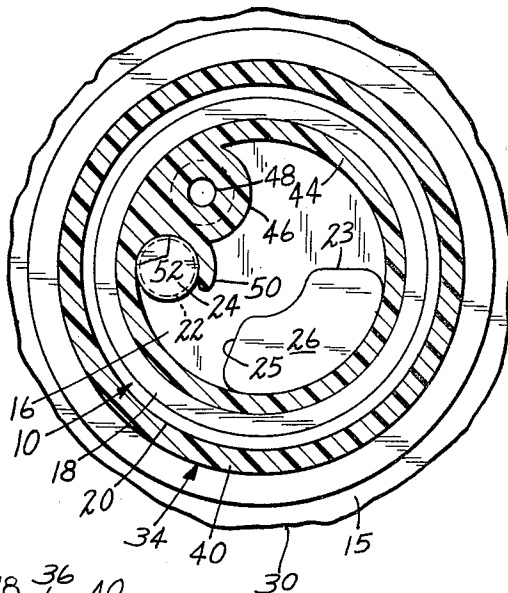


Fig. 8

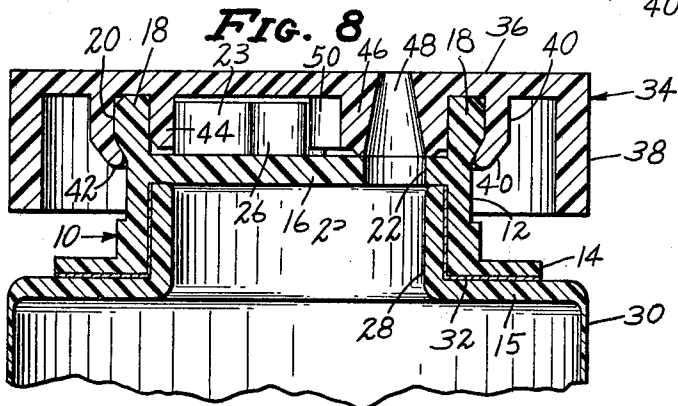
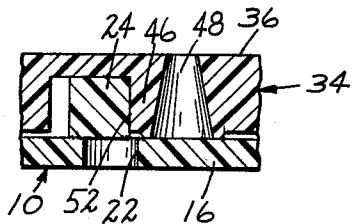


Fig. 9



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FIG. 10

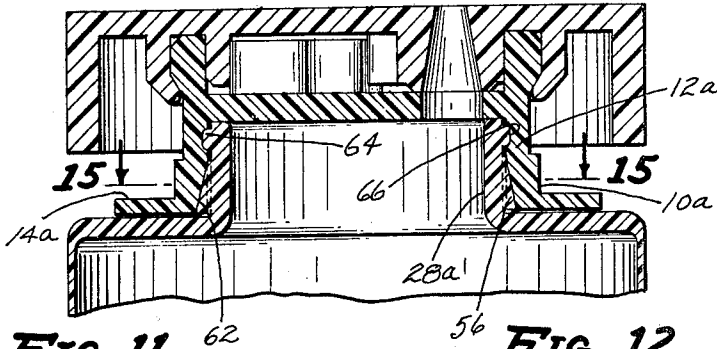


FIG. 11

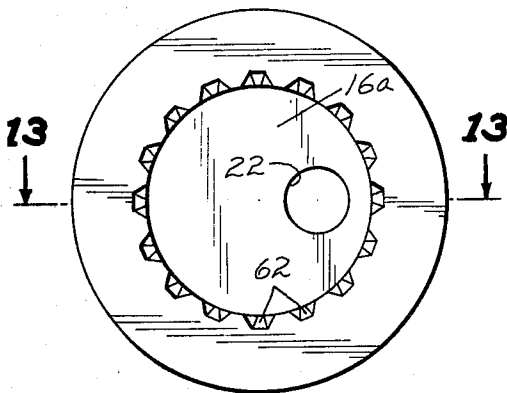


FIG. 12

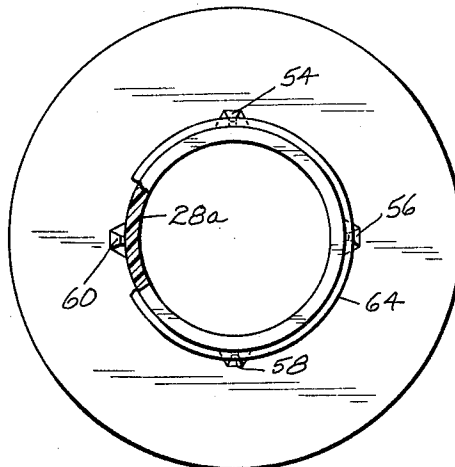


FIG. 13

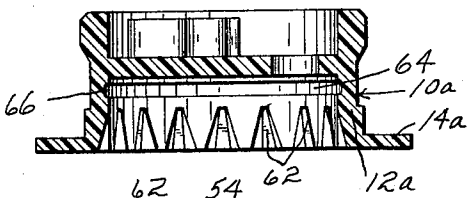


FIG. 14

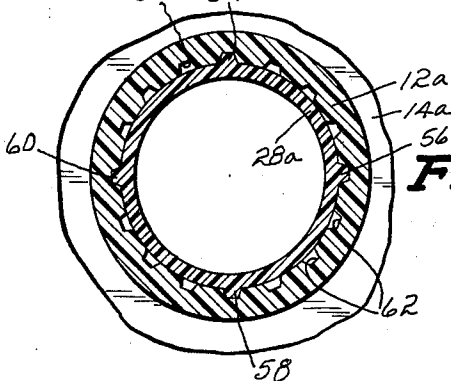
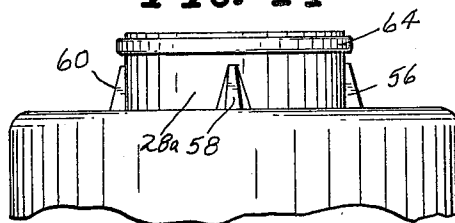


FIG. 15

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3,263,874 CONTAINER CAP HAVING FRANGIBLE SEALING MEANS

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8 Claims. (Cl. 222-498)

The invention relates to an improvement in caps for containers used for the dispensing of liquids therefrom. It is an object of the invention to provide a cap for a container which has a fixed frangible member which provides a positive sealing of the outlet passageway of the cap together with means carried by the cap for severing the frangible sealing member by a simple rotation of the cap, the cap placed in either an "open" or "closed" position by a rotation of the cap after the sealing member has been severed.

It is a further object to provide a new and novel construction for securing a cap member to the neck of a container which adequately secures the cap and does not require orientation of the cap relative to the neck.

It will not be here attempted to set forth and indicate all of the various objects and advantages incident to the invention, but other objects and advantages will be referred to in or else will become apparent from that which follows.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of example a preferred embodiment of the inventive idea wherein like numerals refer to like parts throughout.

In the drawings forming part of this application:

FIGURE 1 is a perspective view of the cap mounted on a container, a portion of the container being shown.

FIGURE 2 is a perspective view of the cap in closed sealed position, portions of which are in section, other portions being broken away.

FIGURE 3 is a top plan view of the base member.

FIGURE 4 is a side elevational view of the base member.

FIGURE 5 is a sectional view on the line 5-5 of FIGURE 3 showing the sealing plug in sealing position.

FIGURE 6 is a bottom plan view of the overcap.

FIGURE 7 is a sectional view on the line 7-7 of FIGURE 2.

FIGURE 8 is a sectional view on the line 8-8 of FIGURE 1 showing the sealing plug in a removed condition and the cap in an "open" condition.

FIGURE 9 is a sectional view on the line 9-9 of FIGURE 1 with the sealing plug shown in a slightly removed condition.

FIGURE 10 is a section through a cap similar to FIGURE 8 but showing the connection construction between the container neck and cap base member.

FIGURE 11 is a bottom plan view of the cap base member.

FIGURE 12 is a top plan view of the neck of the container.

FIGURE 13 is a section on the line 13-13 of FIGURE 11.

FIGURE 14 is a side elevational view of the neck of the container with only a portion of the container being shown.

FIGURE 15 is a horizontal section through the cap member and neck on the line 15-15 of FIGURE 10.

Referring to the drawings in particular, the cap A includes the base member 10 including the vertical hollow cylindrical portion 12 which terminates at its lower edge in the horizontal flange 14 and at its upper edge in the circular wall 16. Extending upwardly from the wall 16

at the periphery thereof is the upstanding annular flange portion 18 coterminous with the hollow cylindrical portion 12, the flange 18 and cylindrical portion 12 forming a collar. The numeral 20 designates an annular bead formed on the outer surface of the upstanding flange portion 18. The wall 16 has formed therethrough the outlet passage hole 22 which is offset from the center of the wall 16. The passage hole 22 is sealed off at the top thereof by the cylindrical plug 24 which may be molded integrally at its edge with the wall 16, the diameter of the plug 24 being slightly greater than the diameter of the outlet passage hole 22. The connection of the edge of the plug 24 with the top of the wall 16 is a light connection and therefore makes the same frangible upon sidewise pressure applied to the plug as hereinafter described.

The numeral 26 designates an arcuate stop having the shoulder ends 23 and 25. The stop 26 is formed on a radius upon the wall 16 and removed from the axis of the top 16. The hollow cylindrical portion 12 of the base 10 may be secured upon the neck 28 of the bottle 30 by means of adhesive 32 with the flange 14 cemented upon the container top wall 15, or a threaded or friction connection may be made between the collar 12 and neck 28 which is not shown. In addition, the connection between collar 12 may be made as disclosed in FIGURES 10-15 as hereinafter described.

Further provided is the overcap 34 which includes the circular top 36 which is coaxial with the base member 10. Depending from the outer edge of the top 36 is the annular wall portion 38. The overcap 34 also includes the collar 40 which depends from the underside of the top 36 concentric with and spaced from the annular wall 38. The collar 40 has formed on the lower edge thereof the intumed annular bead edge 42 which engages the annular bead 20 of the base 10 when the cap is mounted on the base, particularly as shown in FIGURES 2 and 8. The overcap 34 is further formed with the annular flange 44 which depends from the underside of the top 36 and which is concentric with and spaced inwardly from the collar 40.

Extending inwardly from the annular flange 44 and downwardly from the top 36 is the projection 46, and extending through the projection 46 is the outlet hole 48. The outlet hole 48 is offset, i.e. spaced from the center of the overcap 34 and is on the same radius as the outlet passage hole 22 of the base 10.

Extending from the cylindrical projection 46 and as part thereof is the arcuate ear formation 50 which terminates in the arcuate recess 52 formed in the projection 46. The arcuate recess 52 and the arcuate ear formation 50 have the same radius, and the two together form a pocket 51 with an arc slightly greater than 180° thereby forming a mouth at "x" having a dimension slightly less than the diameter of the cylindrical plug 24. The radius of the pocket 51 is substantially that of the plug 24 whereby the plug may be caused to fit into the pocket 51 as hereinafter described.

The center axis of the arcuate recess 52 and the center axis of the outlet hole 48 are the same radius with respect to the center of the circular top 36. Further, the center axis of the passageway 22 is on the same radius as the center axis of the outlet hole 48 with respect to the common axis of cap and base member whereby the outlet hole 48 may be brought into alignment with the passageway 22 as hereinafter described. In addition, the center axis of the arcuate recess 52 is on the same radius as the plug 24 whereby the plug may be severed by the edge of the recess 52 as the overcap 34 is rotated as hereinafter described.

The cap A is assembled and operated as follows. The overcap 34 is placed coaxially upon the base member 10 by forcing the same upon the base whereby the annular bead edge 42 snaps over and engages the annular

bead 20 of the base member with the annular flange 44 adjacent the upstanding flange portion 18. The overcap is thus connected to the base 10 and rotatable thereon. As the overcap 34 is rotated, the vertical wall of recess 52 is forced against the plug 24, and due to the pressure, the plug is severed from the circular top wall 16 thus opening passage 22 and forced into the pocket 51 wherein the plug tends to be retained due to the fact that the distance at "x," FIGURE 6, is slightly less than the diameter of the plug. The cap 34 is then rotated further until the outlet hole 48 thereof is in alignment with the passage 22 whereby the cap A is in full "open" position. To close the cap A, the overcap 34 is rotated in the opposite direction until the outlet hole 48 is out of alignment with the passage 22 and such misalignment is assured when the projection 46 abuts the shoulder 23 of the stop 26. As indicated above, the pocket 51 tends to carry the severed plug 24 as the overcap is rotated to an "open" or "closed" position. When the cap is in an "open" position with the outlet hole 48 in alignment with the passage 22, the plug 24, when held in the pocket 51, abuts the shoulder 25 of stop 26. Thus the "open" position of the cap A is determined with a positive stop position.

With regard to FIGURES 10-15, the cap illustrated is substantially that found in FIGURES 1-9; however, in FIGURES 10-15 the connection of the cap base member 10a to the neck 28a is made by means of a different construction which follows. The neck 28a has formed on the outer peripheral surface thereof the equally spaced tapered splines 54, 56, 58 and 60. The inner surface of the hollow cylindrical portion 12 of the base cap member 10a is formed with equally spaced tapered grooves 62. The splines 54-60 of the neck 28a engage in the grooves 62 of the base member 10a, and with an even number of splines and an even number of grooves 62 the cap base member 10a is easily positioned on the neck 28a without orientation of the neck of the container relative to the cap base member in an assembly line for assembly of cap and container.

Adjacent the upper end of the neck 28a is an extension in the form of the annular bead 64 and formed on the inner surface of the cylindrical wall portion 12a is an annular groove 66. As the base member 10a is forced upon the neck 28a the splines 54-60 engage in the grooves 62 of the cap base member and the annular bead 64 of the neck engages in the annular recess 66 of the cap base member 28a.

As a result, the base member 10a is held against rotative movement on the neck by means of the splines 54-60 within the grooves 62 and simultaneously held against axial movement by means of the bead 64 in the groove 66. The number of grooves 62 must have a minimum number equal to the number of splines such as 54 or be in multiples thereof. With four splines such as 54-60, there is no trouble in mold removal and with, for example, sixteen grooves such as 62, there need be no orientation between the cap base and the container in an assembly line.

The splines 54-60 may be formed on the inner surface of the cylindrical portion 12a of the base member 10a instead of on the neck 28a, and the grooves 62 may be formed on the neck 28a instead of the cylindrical portion 12a. In addition, the annular bead 64 may be formed on the inner surface of the cylindrical portion 12a of the base member 10a instead of the neck 28a and the annular recess 66 of the cylindrical portion 12a of the base 10a may be formed on the neck 28a instead of the base.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. A cap for a container comprising:

- (a) a base member having
- (b) a collar portion for connection with the neck of a container,
- (c) said collar portion having a circular wall formed internally thereof and
- (d) an annular bead on the outer surface thereof,
- (e) said circular wall having an outlet passage extending therethrough offset from the axis thereof,
- (f) a plug connected to the upper surface of said circular wall and sealing off said outlet passage,
- (g) an overcap including
- (h) a circular top wall having
- (i) a collar depending from the underside thereof,
- (j) said collar having an interned flange for gripping engagement with said bead of said base collar portion thereby mounting said overcap axially rotatable and captive on said base,
- (k) said top wall of said overcap having a projection depending from the underside thereof,
- (l) said projection and top wall having an outlet hole extending therethrough which is offset from the axis of said overcap and said base,
- (m) said outlet hole and said passage being equidistant from the axis of said overcap and said base member,
- (n) the initial rotation of said overcap causing said projection to contact said plug and sever it from said circular wall of said base member thereby exposing said outlet passage hole for alignment with said outlet hole of said overcap by further rotation of said overcap, said outlet passage hole being closed by additional rotation of said overcap whereby said outlet hole is out of alignment with said outlet passage.

2. The device of claim 1 further characterized by stop means formed on said circular wall of said base member to limit the rotative movement of said overcap on said base member.

3. A cap for a container comprising:

- (a) a base member having
- (b) a collar portion for connection with the neck of a container,
- (c) said collar portion having a circular wall formed therein,
- (d) said circular wall having an outlet passage extending therethrough,
- (e) a plug connected to the upper surface of said circular wall and sealing off said outlet passage,
- (f) an overcap including
- (g) a circular top wall having
- (h) a collar depending from the underside thereof for rotative engagement with said collar portion of said base member,
- (i) said circular top wall having a projection depending from the underside thereof,
- (j) said projection and circular top wall having an outlet hole extending therethrough which is offset from the axis of said overcap and said base,
- (k) said outlet hole and said outlet passage of said circular wall of said base being equidistant from the axis of said overcap and said base member,
- (l) the initial rotation of said overcap causing said projection to contact said plug and sever it from said circular wall of said base member thereby exposing said outlet passage for alignment with said outlet hole by further rotation of said overcap, said outlet passage hole being closed by additional rotation of said overcap whereby said outlet hole is out of alignment with said outlet passage.

4. The device of claim 3 further characterized by stop means formed on said circular wall of said base member to limit the rotative movement of said overcap on said base.

5. A cap for a container:

- (a) a base member having

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- (b) a collar portion for connection with the neck of a container,
 - (c) said collar portion having a circular wall formed therein,
 - (d) said circular wall having an outlet passage extending therethrough and 5
 - (e) frangible means sealing off said outlet passage,
 - (f) an overcap including
 - (g) a circular top wall having
 - (h) a collar depending from the underside thereof for rotative engagement with said collar portion of said base member, 10
 - (i) said circular top wall having a projection depending from the underside thereof,
 - (j) said projection and circular top wall having an outlet hole extending therethrough which is offset from the axis of said overcap and said base, 15
 - (k) said outlet hole and said outlet passage of said circular wall of said base being equidistant from the axis of said overcap and said base member, 20
 - (l) the initial rotation of said overcap causing said projection to contact said frangible sealing means and sever the same from said circular wall of said base member thereby exposing said outlet passage hole for alignment with said outlet hole by further rotation of said overcap, said outlet passage hole being closed by additional rotation of said overcap whereby said outlet hole is out of alignment with said outlet passage. 25
6. The device of claim 5 further characterized by stop means formed on said circular wall of said base member to limit the rotative movement of said overcap on said base. 30
7. A cap for a container comprising:
- (a) a base member, 35
 - (b) an overcap rotatively mounted on said base member,
 - (c) said base member having an outlet passage covered by frangible sealing means,
 - (d) said overcap having an outlet hole, 40
 - (e) means carried by said overcap for severing said

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- sealing means upon initial rotation of said overcap on said base member, said outlet passage of said base member brought into alignment with said outlet hole by further rotation of said overcap, said outlet passage being closed by additional rotation of said overcap whereby said outlet hole is out of alignment with said outlet passage.
8. A cap for a container comprising:
- (a) a base member,
 - (b) an overcap rotatively mounted on said base member,
 - (c) said base member having an outlet passage covered by frangible sealing means,
 - (d) said overcap having an outlet hole,
 - (e) means carried by said overcap for severing said sealing means upon initial rotation of said overcap on said base member, said outlet passage of said base member brought into alignment with said outlet hole by further rotation of said overcap, said outlet passage being closed by rotation of said overcap in the opposite direction,
 - (f) said base member having stop means formed thereon to limit the rotative movement of said overcap on said base member.

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