

May 2, 1967

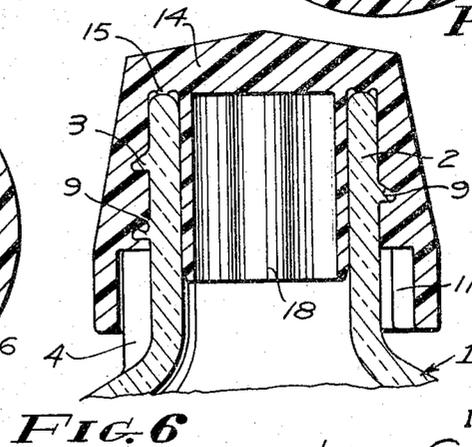
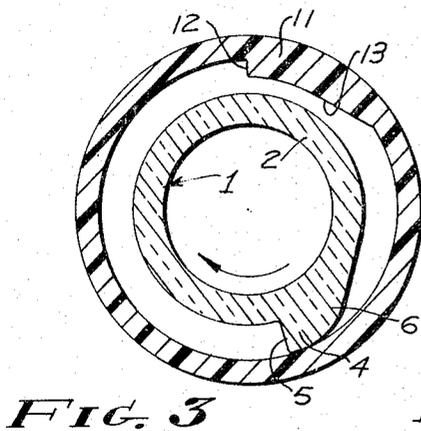
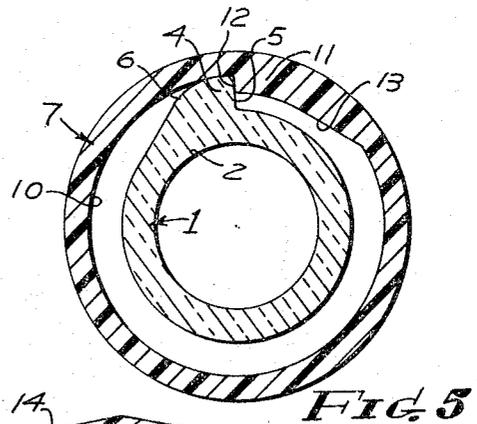
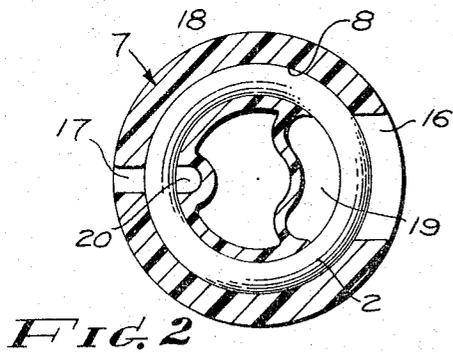
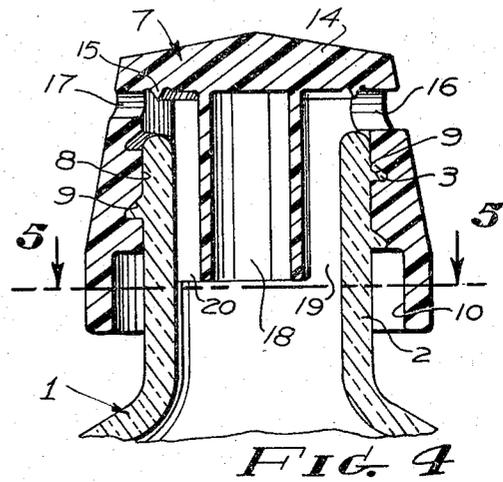
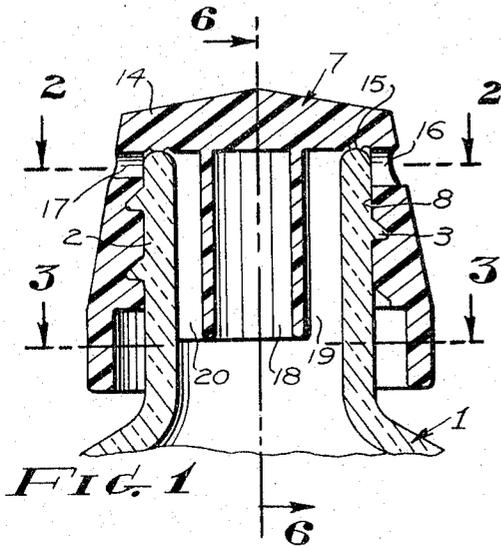
J. G. MORAN

3,317,093

SEALABLE POURING CAP

Filed Dec. 24, 1964

2 Sheets-Sheet 1



INVENTOR.  
JAMES G. MORAN  
BY *Lyon Lyon*  
ATTORNEYS

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2 Sheets-Sheet 2

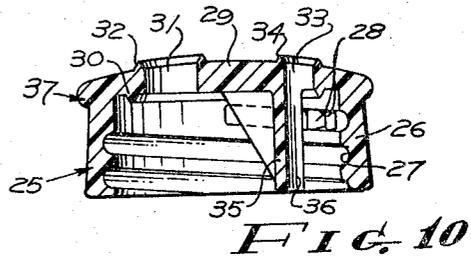
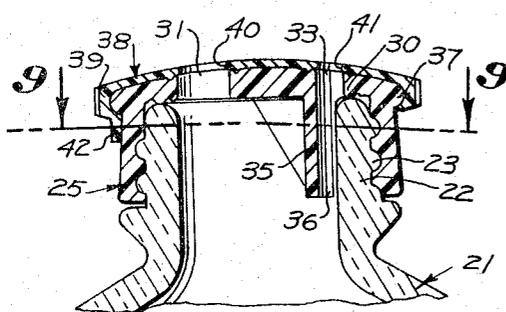
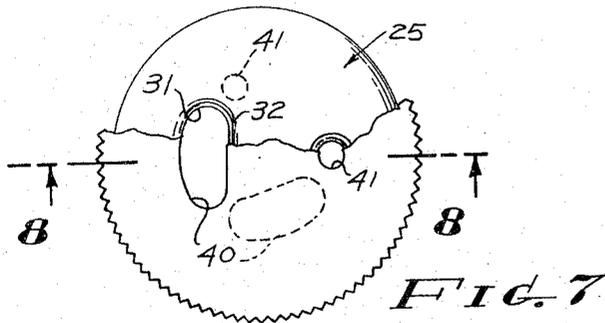


FIG. 8

FIG. 10

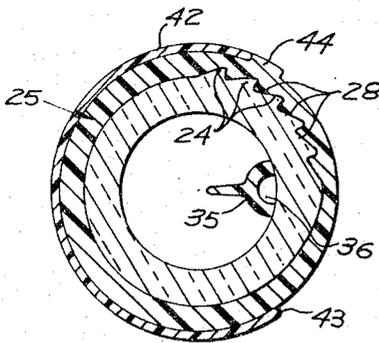


FIG. 9

INVENTOR.  
JAMES G. MORAN  
BY *Lyon & Lyon*  
ATTORNEYS

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3,317,093

## SEALABLE POURING CAP

James G. Moran, 122 N. Rose St., Burbank, Calif. 91505  
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6 Claims. (Cl. 222-484)

This invention relates to sealable pouring caps and included in the objects of this invention are:

First, to provide a sealable pouring cap which is particularly adapted for use on rigid containers, but may also be used on flexible containers.

Second, to provide a sealable pouring cap which incorporates a novel means of separating the flow of liquid from the bottle and the flow of replacement air into the bottle.

Third, to provide a sealable pouring cap, one embodiment of which is a single piece molded member.

Fourth, to provide a sealable pouring cap, another embodiment of which utilizes two members, one of which is adapted to be locked on the container and the other one of which has limited arcuate movement to open and close ports in the first member.

Fifth, to provide a sealable pouring cap which is yieldable so that on assembly it may be forced axially over the screwthreads on a mating bottle to aid assembly by automatic machines.

With the above and other objects in view, as may appear hereinafter, reference is directed to the accompanying drawings in which:

FIGURE 1 is an enlarged fragmentary sectional view showing the neck portion of the container and showing one embodiment of the sealable pouring cap mounted thereon and in its closed position.

FIGURE 2 is a transverse sectional view taken through 2-2 of FIGURE 1.

FIGURE 3 is a transverse sectional view taken through 3-3 of FIGURE 1.

FIGURE 4 is a fragmentary sectional view similar to FIGURE 1 showing the pouring cap in its open position.

FIGURE 5 is a transverse sectional view taken through 5-5 of FIGURE 4.

FIGURE 6 is a fragmentary sectional view taken through 6-6 of FIGURE 1.

FIGURE 7 is a top view of a modified form of the pouring cap with the valve cover partially broken away.

FIGURE 8 is a sectional view taken through 8-8 of FIGURE 7 and showing the neck portion of the container fragmentarily.

FIGURE 9 is a transverse sectional view taken through 9-9 of FIGURE 8 showing particularly the interlocking means between the container and the fixed cap member.

FIGURE 10 is a transverse sectional view of the cap member taken in the same plane as FIGURE 8.

Reference is first directed to FIGURES 1 through 6. The pouring cap here illustrated is adapted to be mounted on a container or bottle 1 which may be molded of glass or of rigid plastic material, although the container need not be limited to such materials. The container includes a neck 2 which is essentially cylindrical in form and of uniform internal diameter. Externally the neck is provided with a screwthread 3 preferably of the buttress type. Below the screwthread the neck is provided with a stop 4 having a radial shoulder 5 and a sloping cam face 6.

The neck of the container is adapted to receive a cap member 7 which includes an essentially cylindrical portion 8 having an internal screwthread 9 mating the screwthread 3. At its lower extremity, the cylindrical portion forms a skirt 10 which clears the stop 4 and is provided internally with a mating stop 11 having a radial shoulder 12 and a sloping cam face 13.

The upper end of the cylindrical portion 8 is closed by a cap portion 14 having an annular seal rib 15 adapted to engage and seal against the extremity of the neck 2.

The cylindrical portion 8 is provided with a discharge slot or outlet 16 and a diametrically disposed air inlet 17 both located contiguous to the capping portion 14.

Extending downward from the capping portion 14 is an internal sleeve 18 which conforms to the inside surface of the neck 2 except that at one side the sleeve forms a discharge channel 19 and at its opposite side an air inlet channel 20.

Operation of the pouring cap shown in FIGURES 1 through 6 is as follows:

The cap member 7 is formed of yieldable plastic material so that if desired, it may be forced axially over the screwthreads to facilitate assembly. As the cap member 7 is screwthreaded into place, the cam faces 6 and 13 interengage to spread the skirt 10 so that the stop shoulders may pass each other. After this is accomplished, the cap member is prevented from unscrewing beyond a predetermined distance.

When the cap member is screwed downward on the container, the seal rib 15 seals against the extremity of the neck 2 so as to seal both the outlet 16 and the inlet 17. When the cap member is partially unscrewed from the container, until limited by engagement by the shoulders 5 and 12 as shown in FIGURE 5, the outlet 16 and the inlet 17 are both opened, as shown in FIGURE 4. When the cap member is in its open position, the interior surface of the neck 2 cooperates with the discharge channel 19 to form a discharge passage communicating with the outlet 16 and similarly, cooperates with the inlet channel 20 to form an inlet passage also communicating with the air inlet 17. By reason of these passages, the contents of the container flow freely and steadily and do not gurgle from the container as the air also flows without interruption into the container.

Reference is now directed to FIGURES 7 through 10. The pouring cap here illustrated is adapted to fit on a container 21 which, as in the first described structure, may be formed of glass or rigid plastic, but not necessarily formed of these materials. The container 21 includes a neck 22 having an external screwthread 23. A portion of the screwthread 23, preferably at the beginning thereof, is provided with a series of serrations 24.

The neck 22 receives a fixed cap member 25 which includes an essentially cylindrical portion 26 having an internal screwthread 27 mating the screwthread 23. The internal screwthread 27 is provided with serrations 28 which mate with the serrations 24 to lock the fixed cap member against movement in a direction to unscrew it from the container. The upper end of the cylindrical portion 26 is closed by a capping portion 29 which is provided internally with a peripheral sealing rib 30 adapted to engage the extremity of the neck 22 when the cap member is forced its full distance of travel onto the container 21.

The capping portion 29 is provided with an outlet slot 31, the external end of which is surrounded by a peripheral bead 32. Diametrically opposite from the outlet slot 31 is an air inlet opening 33 also surrounded by a peripheral bead 34. Depending from the capping portion 29 in alignment with the inlet 33 is a tongue 35 having an air inlet channel 36 cooperating with the adjacent portion of the neck 22 to form an air inlet passage continuing from the inlet 33.

The upper margin of the cylindrical portion 26 is provided with an external flange 37. The outer surface of the capping portion 29 and the flange 37 receives a valve cover 38 having a rim 39 which fits over the flange 37 so as to retain the valve cover on the cap member 25. The valve cover fits snugly over the outer surface of the

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capping portion 29 and sealingly engages the peripheral beads 32 and 34. The valve cover is provided with an outlet opening 40 and an air inlet opening 41 so positioned that they may be moved into and out of registry with the outlet 31 and inlet 33 as indicated by solid lines and dotted lines in FIGURE 7.

The valve cover extends downwardly beyond the flange 37 to form a skirt 42. The skirt 42 is provided with a slot 43 and the cylindrical portion 26 is provided with a stop lug 44 to limit arcuate movement of the valve cover 38 to the extent indicated in FIGURE 9.

The modified pouring cap is employed as follows:

The cap member is forced tightly onto the container bringing the seal rib 30 into engagement with the neck 22 and the serrations into interengagement so that the cap member can only be removed with difficulty. It should be noted that the cap member is formed of plastic material so that it may be distorted in order to accommodate the configuration of the screwthread 23 and serrations 24.

When the valve cover 38 is in its open position, the contents of the container flow uniformly from the outlet 31 and air flows uniformly and without interruption into the inlet 33.

While particular embodiments of this invention have been shown and described, it is not intended to limit the same to the details of the constructions set forth, but instead, the invention embraces such changes, modifications and equivalents of the various parts and their relationships as come within the purview of the appended claims.

I claim:

1. A pouring cap structure for a container having a pouring neck, said cap structure comprising:

(a) a cap member including an essentially cylindrical portion fitted over the neck of a container and a capping portion covering the open end thereof, said cap member having a fluid discharge port and an air inlet port;

(b) a divider member member integral with said capping portion and extending into said pouring neck, said divider member having circumferentially spaced peripheral surfaces in intimate contact with the inner surface of said pouring neck and at least one wall extending between said contacting surfaces, said wall being spaced from and defining with the confronting surface of said pouring neck a passage communicating between at least one of said ports and a point inwardly from said capping portion;

(c) and means for opening and closing said ports.

2. A pouring cap structure as set forth in claim 1, wherein:

(a) said outlet and inlet ports are disposed in said cylindrical portion adjacent said capping portion;

(b) and said opening and closing means includes an annular seal forming a part of said capping portion, and means for moving said cap member axially with respect to said container.

3. A pouring cap structure as set forth in claim 1, wherein:

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(a) said outlet and inlet ports extend axially through said capping portion;

(b) and said opening and closing means in a sealing cover fitted over said capping portion for arcuate movement to uncover and cover said outlet and inlet.

4. A pouring cap structure as set forth in claim 1, wherein:

(a) said contacting surfaces are separated by two walls, and said walls and the confronting surfaces of said cylindrical neck form a pair of passages communicating individually with said ports, said walls isolating said ports from each other.

5. A pouring cap structure as set forth in claim 1, wherein:

(a) said contacting surfaces are separated by a single wall, and one side of said wall forms with the confronting surface of said cylindrical neck, a first passage communicating with one of said ports and the other side of said wall forms with the confronting surface of said cylindrical neck a second passage communicating with the other of said ports, whereby said wall isolates said ports from each other.

6. A pouring cap structure for a container having a pouring neck provided with external attachment means, said cap structure, comprising:

(a) a cap member having an essentially cylindrical portion including means for cooperating with said external attachment means to secure said cap member on said container, and permit limited axial movement of said cap member, and a capping portion overlying the end of said pouring neck;

(b) said cap member having a diametrically disposed outlet and inlet and a peripheral sealing element for engagement with the extremity of said neck, thereby to simultaneously open and close said outlet and inlet on movement of said cap member;

(c) and an internal sleeve depending from said capping portion and having diametrically disposed channels in its outer peripheral surface confronting portions of the inner surface of said pouring neck whereby said portions of the pouring neck form with said channels passages continuing from outlet and inlet.

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ROBERT B. REEVES, *Primary Examiner*.

CHARLES R. CARTER, *Examiner*.