May 14, 1963 I. B. KUBILIUNAS 3,089,626

POURING SPOUT CONSTRUCTION

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Fig. 1.

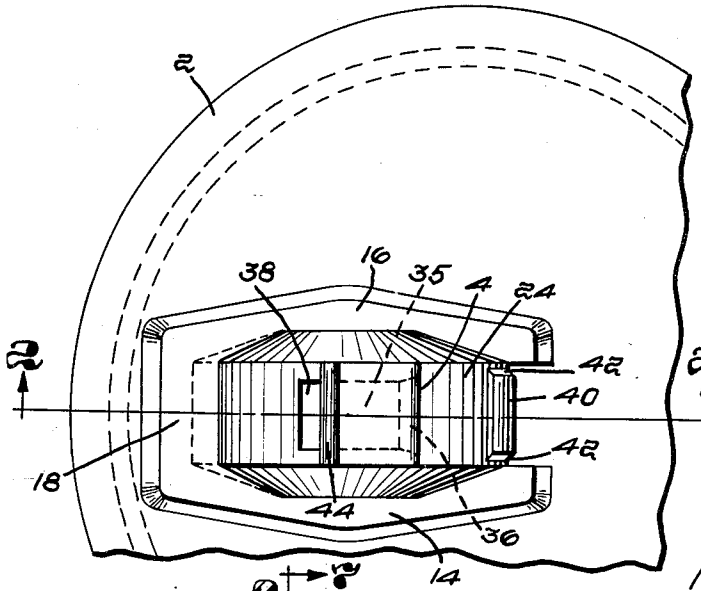
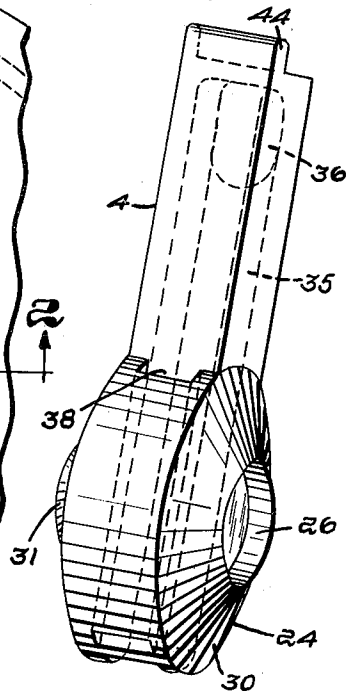


Fig. 3.



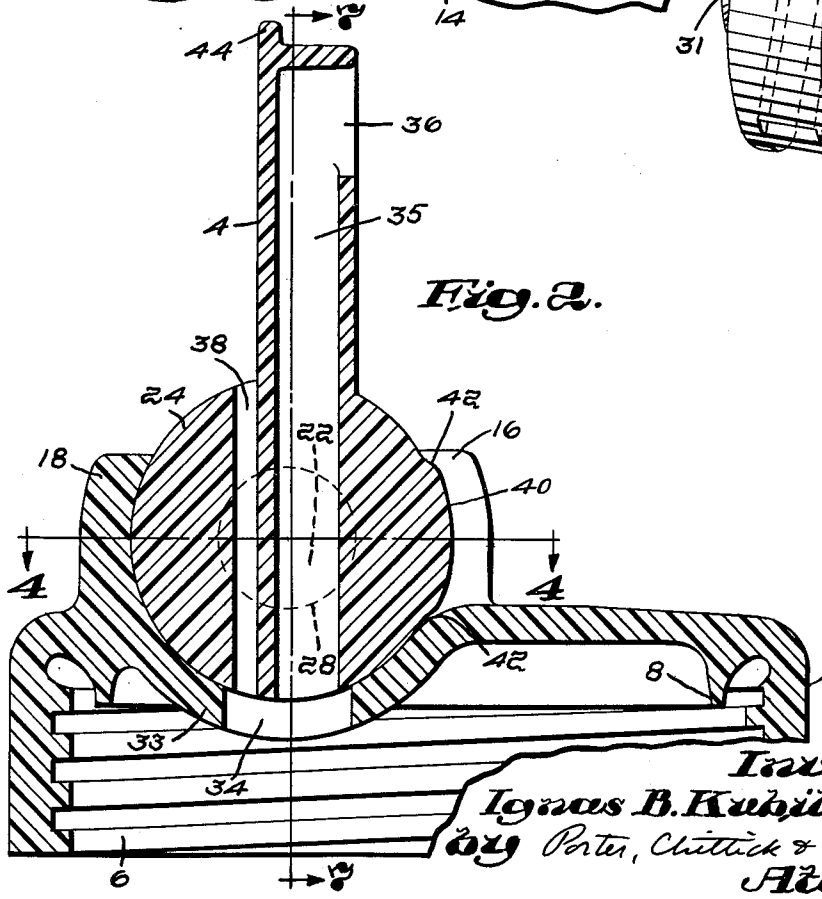


Fig. 2.

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Fig. 4.

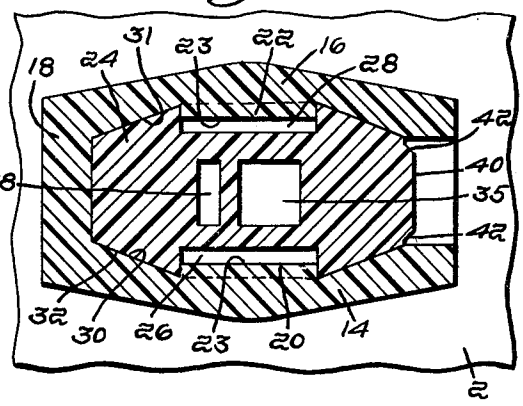

Fig. 5.

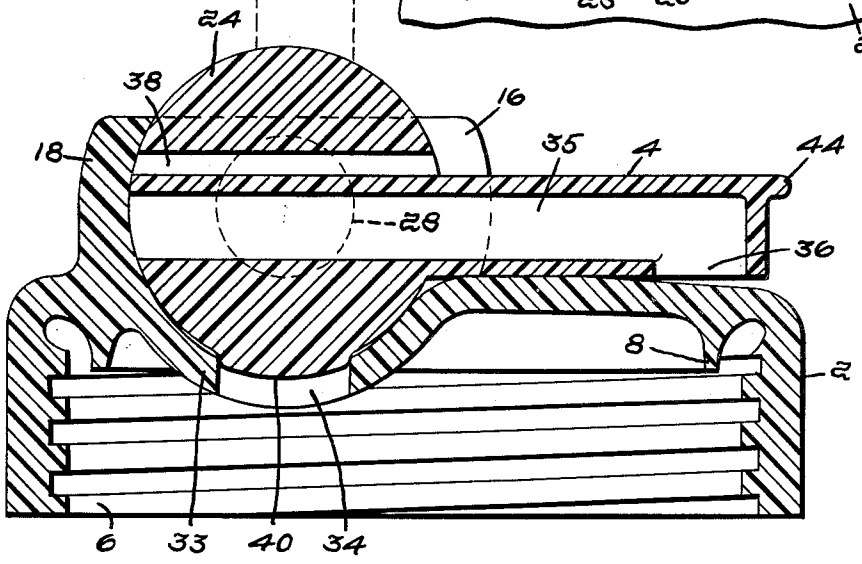

Fig. 6.

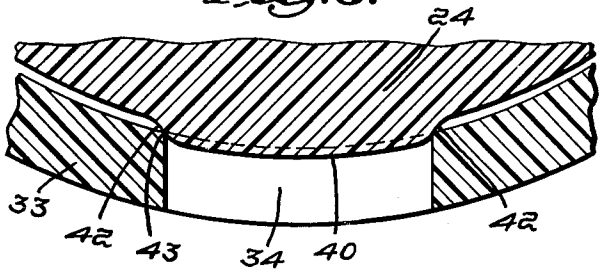

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Fig. 7.

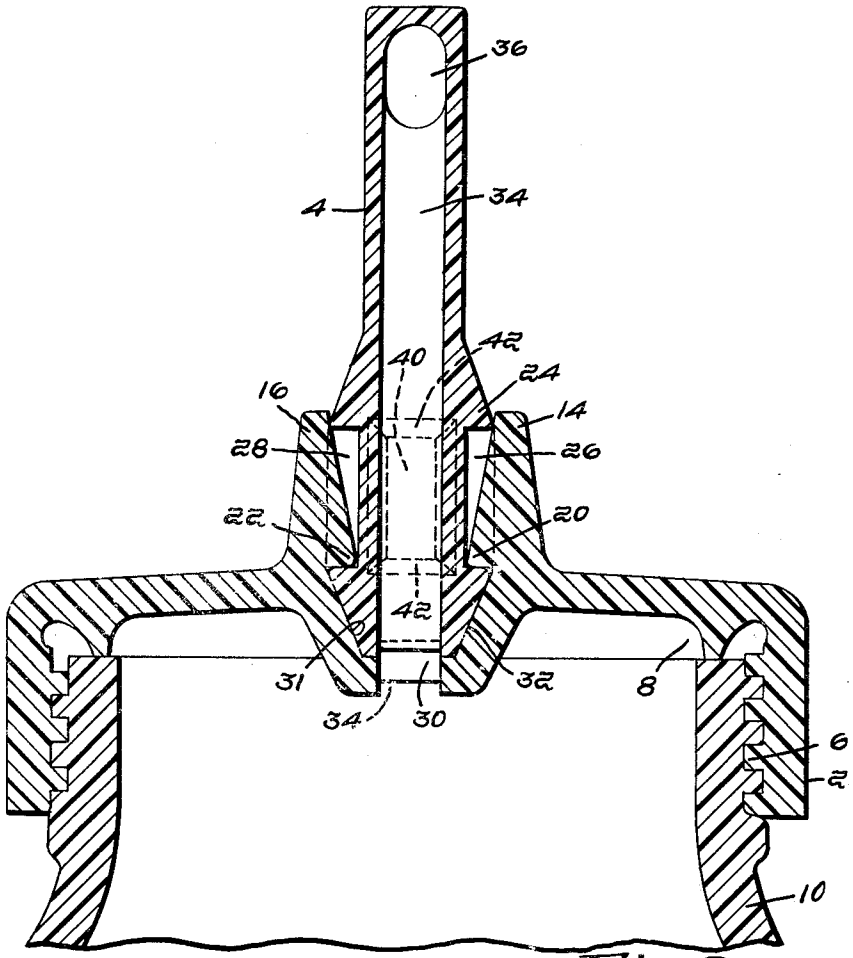


Fig. 8.

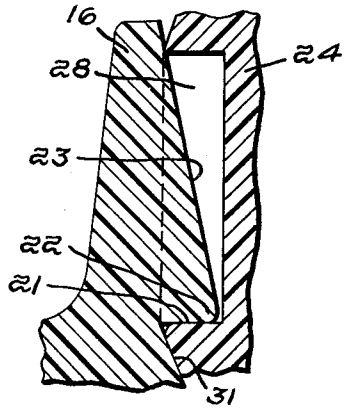
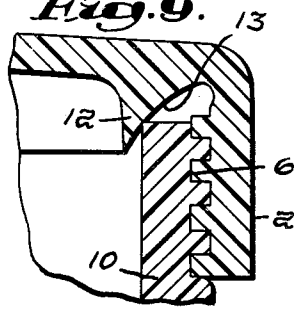


Fig. 9.



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United States Patent Office

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POURING SPOUT CONSTRUCTION

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Filed May 25, 1960, Ser. No. 31,613
5 Claims. (Cl. 222—484)

This invention relates to pouring spouts generally made of polyethylene designed for application to bottles by screwing threads or snapping thereon. The cap of the present invention may be used with rigid bottles, as a vent opening is provided enabling air to enter the bottle as the liquid flows out.

In caps of the general type disclosed herein, it is necessary first that the cap, when screwed to the bottle, be liquid tight at the major threads. Secondly, the swinging spout must be so related to the cap that, when in closed position, it will be liquid tight and, when in open position, liquid will flow readily therethrough without leaking at the joints. Thirdly, the cap must be of such construction as to lend itself to quantity production by molding in a manner which permits easy and inexpensive assembly of the moving parts.

Caps with swinging spouts are now well known in the art. One of the commonest forms in use is that shown in the patent to Wilson et al., 2,793,795. In this type of construction, the swinging spout has thereon a pair of trunnions which are snapped into corresponding engaging seats in the cap proper. The present construction seeks to eliminate the use of the trunnions which, due to their length and flexiblity, do not hold the elements as tightly together as desired. Another object of the present invention is to provide a construction in which the length of the spout is materially increased, thereby facilitating opening and closing of the spout, as well as making it possible to direct the end of the spout closer to a desired objective.

Accordingly, the structure herein disclosed contemplates what might be said to be a reversal of conventional practice in that the trunnions instead of being on the spout are on the cap, with corresponding receiving cavities on either side of the spout into which the facing trunnions may be snapped. The opening through the cap is located off center as much as possible, thus allowing an increase in the length of the spout while still keeping it within the confines of the cap diameter when in closed position.

These and other objects of the invention will be more clearly understood as the description proceeds with the aid of the accompanying drawings in which:

FIG. 1 is a plan view of the cap broken away in part with the spout in open position.

FIG. 2 is a vertical section taken on the line 2—2 of FIG. 1.

FIG. 3 is a prospective view of the spout prior to its application to the cap.

FIG. 4 is a horizontal section taken on the line 4—4 of FIG. 2.

FIG. 5 is a view similar to FIG. 2 but with the spout in closed position.

FIG. 6 is an enlarged detail of the sealing element on the spout showing its engagement with the seat at the upper end of the opening through the cap.

FIG. 7 is a vertical section taken on the line 7—7 of FIG. 2 and showing the cap screwed to a bottle.

FIG. 8 is an enlarged detail showing one of the cap trunnions in position in one of the circular side openings of the spout.

FIG. 9 shows a modified form of means for sealing the cap to the bottle top.

Referring to FIGS. 1, 2 and 5, the cap is indicated at 2, the spout at 4, the cap threads at 6, and the sealing flange at 8. When the cap 2 is screwed on the bottle 10, as illustrated in FIG. 7, the flange 8 rests evenly and tightly on the top thereof to make to secure seal. In a modified construction, the seal 8 may take another form, as shown at 12 in FIG. 9. In this case, the seal 12 is designed to rest partly within the bottle neck with the sloping portion 13 engaging the inner edge to make a liquid tight connection.

Integral with the cap 2 are a pair of upstanding opposed conically shaped walls 14 and 16 connected at the rear by the wall 18 which has an arcuate cylindrical inner surface. Extending inwardly from the walls 14 and 16 are a pair of oppositely disposed hooks 20 and 22 having circular bottom areas 21 and sloping opposed faces 23 so designed to facilitate the entrance therebetween of the main body portion 24 carrying the spout 4. The opposite faces of the main body 24 are conically shaped to match the interior of walls 14 and 16. These faces have therein two circular depressions 26 and 28 into which the hooks 20 and 22 snap (permitted by the flexible material of which the parts are made) as the main body portion 24 is forced down to the position best shown in FIGS. 4, 7 and 8. When the body portion is in this position, the flat opposed conical portions 30 and 31 of the spout body are in tight nested engagement with the corresponding sides of recess 32 in the cap. Similarly the cylindrical outer wall of body portion 24 rests against the cylindrical inner wall of the cap.

From the description thus far, it is believed clear that the spout 4, when in open position as shown in FIGS. 2 and 7, may be readily swung downwardly to the position shown in FIG. 5, with the hooks 20 and 22 providing the axes of rotation about which the circular walls of the depressions 26 and 28 turn.

The end 18 of the upstanding wall continues forward under the body of the spout as at 33 in FIG. 2, and in this wall is a rectangular opening 34 which constitutes the outlet through the cap body. The spout 4 has a discharge passage 35 which terminates in a laterally disposed opening 36. Adjacent this passage is a vent opening 38 which permits air to enter the bottle as the liquid leaves it. When the spout is in vertical position, as shown in FIGS. 1, 2 and 7, both discharge and vent passages 34 and 38 are in direct connection with the opening 34. When the bottle is tilted, with the opening 36 in down position, liquid will escape through discharge passages 35 and 36 and air will enter the bottle through vent passage 38.

When the spout 4 is swung to closed position, as shown in FIG. 5, the cap opening 34 is closed. This closure is made leak-proof by the provision on the side of the spout body 24 of a raised surface 40 having four beveled edges 42 extending about the four sides. These beveled edges make tight sealing engagement with the peripheral upper edge 43 of opening 34. This is best shown in FIG. 6. Since the raised portion 40 is of slightly greater radius than the balance of the spout body, it follows that when it is positioned in opening 34 with the spout closed the body 24 immediately adjacent the beveled edges 42 will be forced upwardly as in FIGS. 5 and 6. This extra pressure against edge 43 insures a tight seal.

As can be seen in FIGS. 1, 2 and 5, the cap opening 34 is substantially off center. This makes it possible for spout 4 to be of greater length without overhanging the side of cap 2 than would be the case if the opening 34 were directly in the center.

To facilitate opening of the spout, there is a small lip 44 on the end thereof which may be readily engaged by the user's finger.

It is my intention to cover all changes and modifica-

tions of the examples of the invention herein chosen for purposes of the disclosure which do not constitute departures from the spirit and scope of the invention.

I claim:

1. A dispensing closure, said closure comprising a screw threaded cap, an opening through the top of said cap, a pair of upstanding opposed walls on opposite sides of said opening and having at their lower parts opposed areas which constitute portions of conical surfaces, an arcuate cylindrical inner wall integral with said cap top and connecting said opposed walls, said arcuate inner wall commencing at said opening and extending upwardly therefrom, a pair of opposed hooks attached to said opposed walls and having circular outer surfaces with aligned axes coincident with the axes of said portions of conical surfaces, said axes being generally normal to said upstanding opposed walls, a rotatable discharge element comprising a body portion with a cylindrical outer walls and having opposed truncated conical surfaces similar to the conical surfaces of said opposed walls and with axially disposed shallow depressions therein, said depressions having cylindrical inner faces, said inner faces coaxial with said opposed truncated conical surfaces and having their axes generally normal to said body portion, a spout extending from said body, a passage commencing in said cylindrical outer wall and extending through said body portion and spout, said body portion nested in sliding engagement with the said corresponding opposed walls and cylindrical inner wall of said cap, said hooks being disposed in said shallow depressions with said circular outer surfaces of said hooks in sliding engagement with said cylindrical inner faces of said openings whereby said spout may be swung from vertical to horizontal position with the said body portion firmly locked within said cap walls and whereby the said passage through said body and spout may be moved from alignment with the opening through said cap to a position out of alignment with said opening and with a part of said cylindrical outer wall of said body portion closing said opening.

2. A dispensing closure, said closure comprising a screw threaded cap having a depending circumferential flange at the top interior of said cap, said flange adapted to sealingly engage the upper end of a bottle neck on which said cap may be screwed, an opening through the top of said cap, a pair of upstanding opposed walls on opposite sides of said opening and having at their lower part opposed areas which constitute portions of conical surfaces, an arcuate cylindrical inner wall integral with said cap top and connecting said opposed walls, said opening being in said inner wall at the bottom section thereof, a pair of opposed hooks attached to said opposed walls and having outer circular surfaces with aligned axes coincident with the axes of said portions of conical surfaces, said axes being generally normal to said opposed walls, a rotatable discharge element comprising a body portion with a cylindrical outer wall and having opposed truncated conical surfaces similar to the conical surfaces of said opposed walls and with axially disposed circular depressions therein, a spout extending from said body portion, a passage commencing in said cylindrical outer wall and extending through said body portion and spout, said body portion being nested within said opposed walls with said hooks being disposed in said circular depressions and the conical and cylindrical surfaces of said body portion being in sliding engagement with the said conical surfaces and cylindrical inner wall of said cap whereby said spout may be swung from vertical to horizontal position and whereby the said passage through said body and spout may be moved from alignment with the opening through the arcuate inner wall of said cap to a position out of alignment with said opening and said opening will be closed by said cylindrical outer wall of said body portion.

3. A dispensing closure, said closure comprising a screw threaded cap, an opening through the top of said

cap, a pair of upstanding opposed walls having at their lower part opposed areas which constitute portions of conical surfaces, a cylindrical inner wall integral with said cap top and connecting said opposed walls, an opening through said cap and passing through the lower part of said inner wall and between said opposed walls, a pair of opposed hooks attached to said opposed walls and having circular outer surfaces with aligned axes coincident with the axes of said portions of conical surfaces, a rotatable discharge element comprising a body portion having an outer cylindrical wall and opposed truncated conical surfaces similar to the cylindrical inner wall and the conical surfaces of said opposed walls and with axially disposed depressions therein, said depressions having cylindrical inner faces, said body portion nesting within and slidably resting on the corresponding walls of said cap, a spout extending from said body portion, a passage commencing in the outer cylindrical wall and extending through said body portion and spout, said hooks being disposed in said circular depressions with the outer surfaces of the hooks engaging the inner faces of the depressions whereby said spout and body portion may be rotated from vertical position in which said opening and passage are in alignment to horizontal position in which said passage is out of alignment with said opening and with part of said body portion cylindrical wall closing said opening, said cap having a circumferential flange extending downwardly from the top of said cap and of less radius than the threads, said flange having an inwardly sloping outer surface terminating in a thin edge, the diameter of said thin edge being slightly less than the interior diameter of the neck of the bottle with which said cap is to be used whereby when said cap is screwed on the neck of the bottle the inner edge of the end of the bottle will engage the outer sloping periphery of said flange to bend said flange inwardly to cause a tight seal between said flange and the neck of said bottle.

4. A dispensing closure, said closure comprising a screw threaded cap, an eccentrically disposed opening through the top of said cap, a pair of upstanding opposed walls on opposite sides of said opening and having at their lower part opposed areas which constitute portions of conical surfaces, a cylindrical inner wall integral with said cap top and connecting said opposed walls, said opening passing through the bottom part of said inner wall, a pair of opposed hooks attached to said opposed walls and having circular outer surfaces with aligned axes coincident with the axes of said portions of conical surfaces, a rotatable discharge element comprising a body portion with a cylindrical outer wall and having opposed truncated conical surfaces similar to the conical surfaces of said opposed walls and with axially disposed depressions therein, said depressions having cylindrical inner faces coaxial with said truncated conical surfaces, a spout extending from said body portion, a passage through said body portion and said spout, said body portion nesting within and in sliding engagement with the corresponding walls of said cap, said hooks being disposed in said circular depressions with the cylindrical inner surfaces of said circular depressions in sliding engagement with the circular outer surfaces of said hooks whereby said spout and body portion may be rotated from vertical to horizontal position and the said passage through said body portion and spout may be moved from alignment with the opening through said cap to a position out of alignment with said opening and said opening will be closed by a part of the cylindrical wall of said body portion.

5. The combination of a screw threaded cap and a cooperating rotatable element mounted therein, said cap comprising spaced opposed concave conically shaped walls and a circular inner wall joining said spaced walls, an opening through said circular inner wall at the lowest part thereof, opposed hooks extending toward each other from said spaced walls and having circular outer surfaces

concentric with the axes of said spaced walls, said element mounted in nested relation between said spaced walls and comprising a body portion having opposed truncated conical surfaces and a cylindrical outer wall therebetween matching said spaced walls and circular inner wall, an axially disposed depression in each of said conical surfaces and having one of said hooks therein, each of said depressions having a cylindrical inner face for slidably engaging the circular outer surface of the cooperating hook, a spout extending from said body portion, a passage commencing in said outer wall and extending through said body portion and spout, an air vent through said body portion and spout paralleling said passage, said passage and air vent alignable in open position with said cap opening by suitable rotation of said body portion and spout, a raised area on the outer wall of said body portion approximately 90° from the

entrance to said passage, said raised area having beveled edges about its periphery, which beveled edges are shaped to engage the periphery of said opening through said circular inner wall of said cap when said body portion and spout have been rotated 90° from aligned to closed position.

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