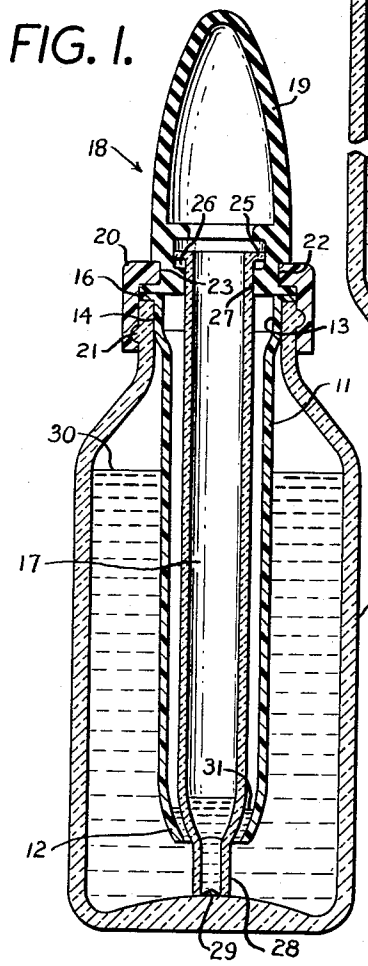
Aug. 5, 1958 E. A. ZACKHEIM 2,845,963

DISPENSING BOTTLES

Filed April 16, 1956

FIG. 1.



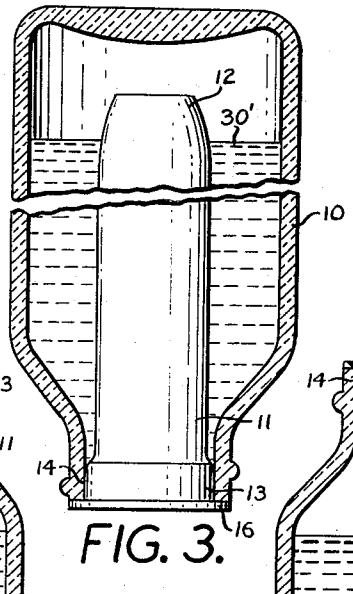


FIG. 3.

FIG. 2.

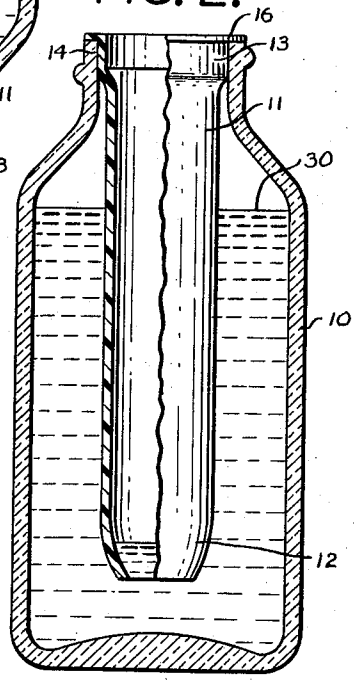


FIG. 5.

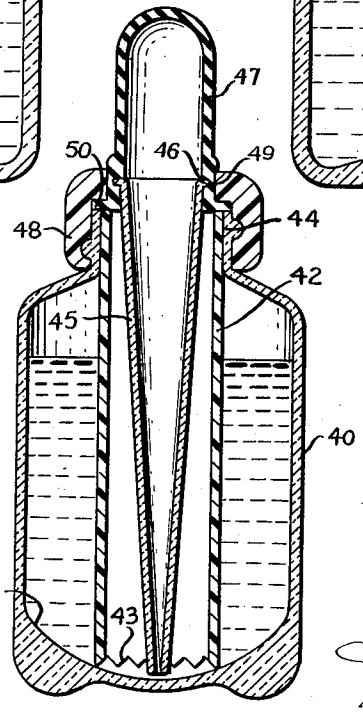


FIG. 6.

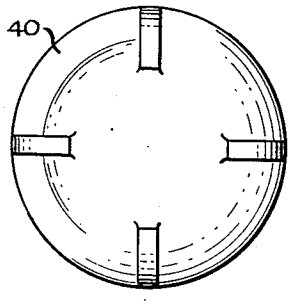
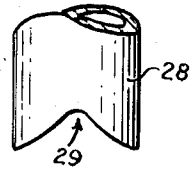


FIG. 4.



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United States Patent Office 2,845,963 Patented Aug. 5, 1958

2,845,963

DISPENSING BOTTLES

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Application April 16, 1956, Serial No. 578,297

14 Claims. (Cl. 141—24)

This invention relates to improvements in dispensing bottles.

The general object of the invention is to provide a dispensing bottle equipped with, or usable with, a dropper in which loss due to spillage, when the bottle is accidentally overturned, is minimized, as also danger of drinking of the contents by small children.

A dispensing bottle embodying the invention in a preferred form will now first be described with reference to the accompanying drawing and the features forming the invention will then be pointed out in the appended claims.

In the drawing:

Fig. 1 is a central or axial section of a bottle embodying the invention in a preferred form;

Fig. 2 is a view similar to Fig. 1, but with a stopper and dropper element removed;

Fig. 3 is a view similar to Fig. 2, but showing the bottle inverted;

Fig. 4 is an enlarged fragmentary elevational view of a part of Fig. 1;

Fig. 5 is a view similar to Fig. 1, but showing a modification; and

Fig. 6 is a bottom elevational view of the bottle of Fig. 5.

The bottle 10 of Fig. 1 may be of glass and otherwise of usual construction and shape. Fitted in the neck and in sealing relation thereto is a well tube 11 which may have a narrowed tip 12 and enlarged upper end 13, the upper end 13 fitting in the bottle neck, as indicated. The well tube 11 is conveniently made of polyethylene or other somewhat resilient material, at least as to the upper end 13, so that the upper end forms a plug or stopper effectively sealing to the bottle neck by pressure contact along the engaging or abutting surface 14. The tip 11 may have a flange 16 to limit its downward or inward movement and seating on the top of the bottle 10, as indicated.

Fitting comfortably within the tube 11 is a barrel or body portion 17 of the dropper and cap assembly 18, which body portion may be of glass, polyethylene or any other suitable material. The uper end of the dropper assembly 18 comprises an elastic bulb 19 secured to a bottle cap element 20, which may be a screw cap, as shown, being internally threaded to fit the usual thread 21 molded in the bottle neck. The bulb 19 may be of rubber and the cap 20 of suitable comparatively rigid material, these two elements being assembled together by molding a groove 22 in the bulb within which the top of the cap 20 surrounding a simple aperture 23 is accommodated, the bulb 19 having sufficient elasticity to permit snapping the parts together. The dropper barrel 17 is formed with an outwardly extending rim or flange 25 received within an internal groove 26 of the bulb 19, the bulb element 19 below the groove fitting the barrel 17 at 27, as indicated. As will be understood, the material of the bulb element 19 is sufficiently elastic to permit insertion of the barrel 17 through the opening at 27.

The groove 26 is preferably elongated in the axial direction, as shown, and fits the rim or flange of the barrel 17. In the initial assembly, the dropper element 18 is assembled together with the bottle 10, with the rim 25 in a downward position in the groove 26, so that when the tip 28 of the barrel 17 engages the bottom of the bottle, further screwing on of the cap 20 will locate the rim 25 at the proper position along the groove 26 for positioning the barrel tip 28 in contact with the bottom of the bottle when the cap is screwed on the bottle. In this way, the tip of each dropper may be brought to the bottom of the bottle, despite variation in the vertical dimensions of normally available bottles. To permit liquid access, the tip 28 is notched as indicated at 29.

When the bottle is full or substantially so, the level 30 around the well tube 11 may be about as indicated in Fig. 1, while the level 31 within the well tube 11 may be much lower and may also be about as indicated. Since any rise in the level 31 involves a drop in the level 30 and a corresponding increase in volume in the trapped air space above this level within the bottle 10 and around the well tube 11, the well tube 11 may be practically empty while the bottle around the well tube is practically full.

The removal of the stopper or dropper element 18, as indicated in Fig. 2, does not essentially change conditions, the liquid levels remaining about the same. If now the bottle is inverted, as indicated in Fig. 3, a small amount of liquid within the well tube 11 will be discharged, plus such small amount as may enter this tube during the tipping movement. However, once the bottle is inverted, the liquid level 30' (Fig. 3) will now be below the open end of the tube 11, so that there would be no further escape of the contents. As will be apparent, loss of liquid due to tipping as well as danger of drinking an excess and dangerous dose by children or others from the bottle is minimized.

In the modified construction shown in Figs. 5 and 6, a bottle 40 having a rounded inside bottom 41 is utilized to permit even more complete dispensing by means of the dropper of the contents. In this case, well tube 42 goes to the bottom of the bottle and is notched as at 43 to permit flow of liquid, from the space outside the well tube into its interior. The tube 42 has a pressure fit forming a sealing engagement with the inside of the bottle neck along the surface 44. In this case, the upper end of the well tube 42 may serve to determine the depth to which the tube of the dropper barrel 45 goes within the bottle. The dropper is shown as of a conical shape, terminating as before in an upper flange 46 which snaps into a groove formed in the inner wall of the resilient bulb element 47. The latter has a snug fit within the cap 48 engaging the inner wall 49 of the top aperture therein, and is held in position vertically with respect to the cap by means of a lower flange 50, as indicated. The cap and bottle are correspondingly threaded, as before.

What is claimed is:

1. A dispensing liquid container comprising, in combination, a bottle having a neck opening, a well tube fitting in the neck opening in sealed relation thereto and extending downwardly to a point adjacent the bottom of the bottle so as to separate the interior of the bottle generally into a space within the well tube and a space outside it, a cap fitting the bottle in sealing relation thereto and comprising a dropper having a barrel accommodated within the well tube, the tip of the dropper barrel being also adjacent the bottom of the bottle when the cap is in position on the bottle.

2. A dispensing liquid container comprising, in combination, a bottle having a neck opening, a well tube fitting in the neck opening in sealed relation thereto and

extending downwardly to a point adjacent the bottom of the bottle so as to separate the interior of the bottle generally into a space within the well tube and a space outside it, a cap fitting the bottle in sealing relation thereto and comprising a dropper having a barrel accommodated within the well tube, the tip of the dropper barrel extending closer to the bottom of the bottle than the well tube when the cap is in position on the bottle.

3. A dispensing liquid container comprising, in combination, a bottle having a neck opening, a well tube fitting in the neck opening in sealed relation thereto and extending downwardly to a point adjacent the bottom of the bottle so as to separate the interior of the bottle generally into a space within the well tube and a space outside it, while leaving space for flow between said spaces below a predetermined level, a cap fitting the bottle in sealing relation thereto and comprising a dropper having a barrel accommodated within the well tube, the tip of the dropper barrel being below the said level when the cap is in position on the bottle.

4. A dispensing liquid container according to claim 3, in which the bottom of the well tube has a configuration different from the bottom of the bottle, whereby the well tube may abut against the bottom of the bottle while leaving said space for flow.

5. A dispensing liquid container according to claim 3, in which the lower end of the well tube is notched so as to provide said space for flow.

6. A dispensing liquid container according to claim 3, in which the tip of the dropper barrel is notched to permit flow into the dropper barrel when it is in contact with the bottom of the bottle.

7. A dispensing liquid container comprising, in combination, a bottle having a neck opening, a well tube fitting in the neck opening in sealed relation thereto and extending downwardly to a point adjacent the bottom of the bottle so as to separate the interior of the bottle generally into a space within the well tube and a space outside it, a dropper having a barrel accommodated within the well tube and abutment means engaging the neck of the bottle to limit the insertion of the dropper, the tip of the dropper barrel being also adjacent the bottom of the bottle when the abutment means is in engagement with the bottle neck.

8. A dispensing liquid container comprising, in combination, a bottle having a neck opening and having a concave bottom, a well tube fitting in the neck opening in sealed relation thereto and extending downwardly to a point adjacent the deepest part of the bottom of the bottle so as to separate the interior of the bottle generally into a space within the well tube and a space outside it, a cap fitting the bottle and comprising a dropper having a barrel accommodated within the well tube, the tip of the dropper barrel being also adjacent the bottom of the bottle when the cap is in position on the bottle.

9. A dispensing liquid container comprising, in combination, a bottle having a neck opening, a well tube fitting in the neck opening in sealed relation thereto and extending downwardly to a point adjacent the bottom of the bottle so as to separate the interior of the bottle generally into a space within the well tube and a space outside it, while leaving space for flow between said spaces below a predetermined level, a cap fitting the bottle and comprising a dropper having a barrel accommodated within the well tube, the dropper comprising a bulb and barrel holding elements receiving and frictionally holding the upper end of the barrel, whereby the barrel position in the bottle may be adjusted to bring its tip in contact with the bottom of the bottle when the cap is in position thereon.

10. A dispensing liquid container according to claim 9, in which the tip of the dropper barrel has a configuration different from the bottom of the bottle, whereby the said tip may abut against the bottom of the bottle while leaving space for flow into the barrel.

11. A dispensing liquid container according to claim 9, in which the tip of the dropper barrel is notched to permit flow into the dropper barrel when it is in contact with the bottom of the bottle.

12. A dispensing liquid container according to claim 9, in which the barrel holding element has an internal groove and the barrel has an upper flange frictionally fitting therein and slidable axially thereof.

13. A dispensing liquid container comprising, in combination, a bottle having a neck opening, a cap fitting the bottle and comprising a dropper having a barrel extending within the bottle, the dropper comprising a bulb and means for holding the barrel in operative relation thereto, the last said means comprising a member having an internal groove and a flange on the barrel frictionally fitting therein and slidably axially thereof, whereby the barrel position in the bottle may be adjusted to bring its tip in predetermined relation to the bottom of the bottle when the cap is in position thereon.

14. A dispening liquid container according to claim 13, in which the barrel length from tip to flange exceeds the distance from the bottom of the bottle to the said groove, whereby placing the cap in position on the bottle will force the barrel upwardly so as to locate the said flange in the groove at the proper position for bringing the tip of the barrel into contact with the bottom of the bottle.

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