Feb. 13, 1968 R. S. WALLACE 3,368,722

TUBE FLUID DISPENSER APPARATUS

Original Filed July 23, 1965 2 Sheets-Sheet 1

FIG. 1.

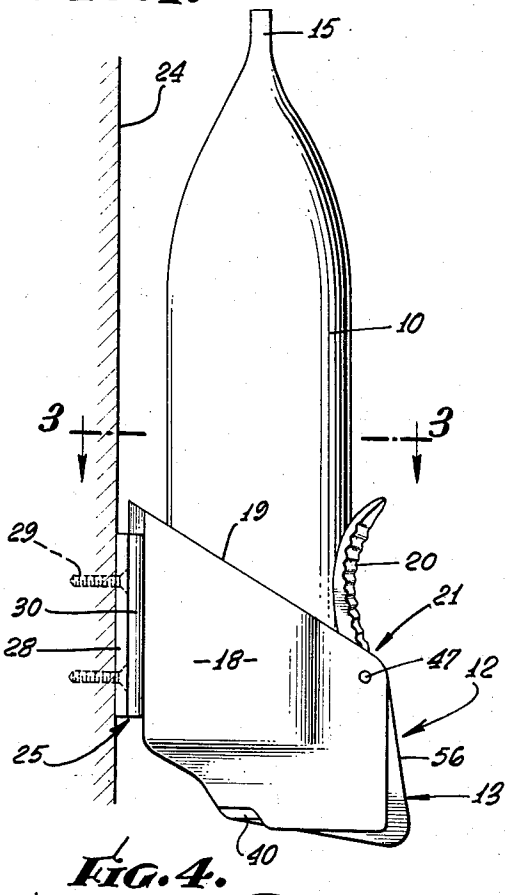


FIG. 2.

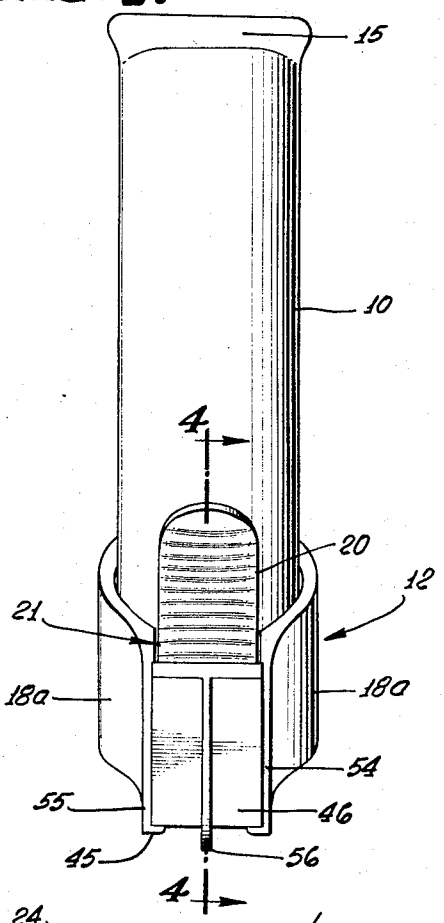


FIG. 4.

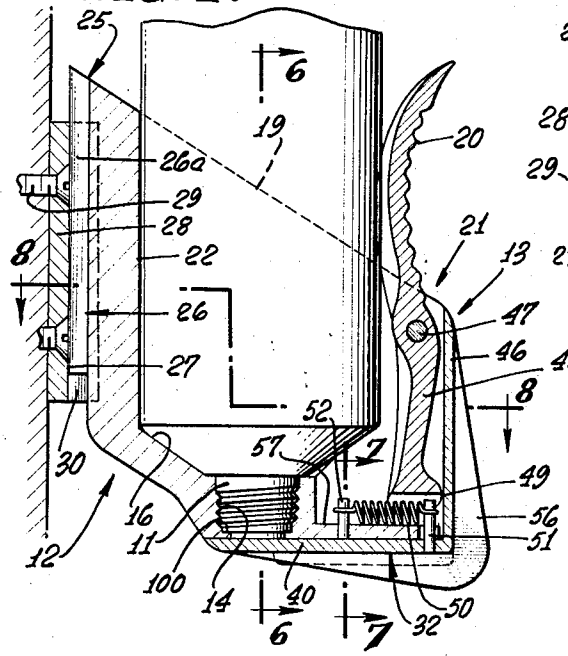
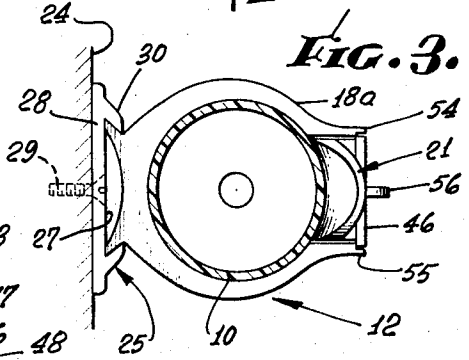


FIG. 3.



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FIG. 5.

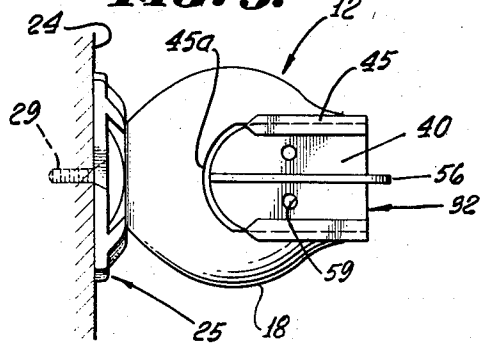


FIG. 6.

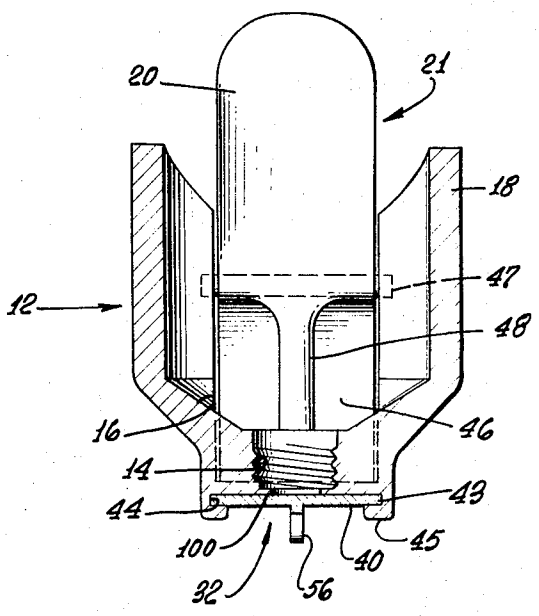


FIG. 7.

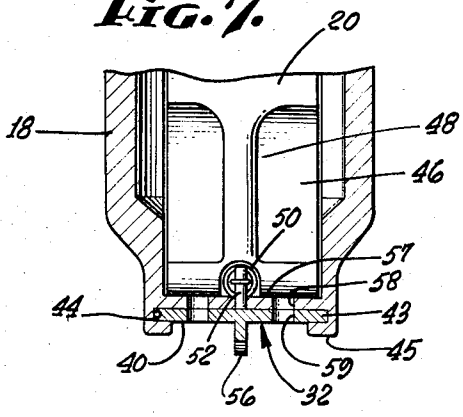


FIG. 8.

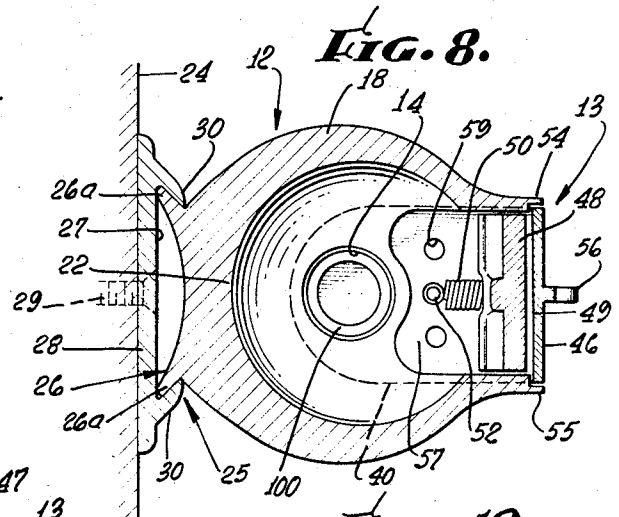


FIG. 9.

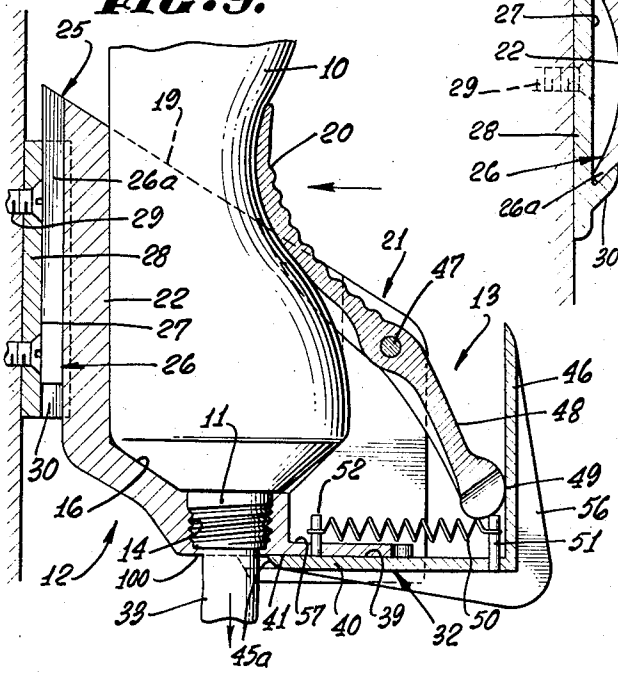
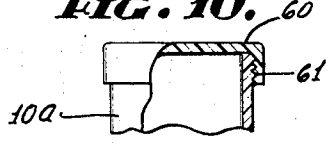


FIG. 10.



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TUBE FLUID DISPENSER APPARATUS

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Continuation of application Ser. No. 474,293, July 23, 1965. This application Jan. 16, 1967, Ser. No. 609,689
3 Claims. (Cl. 222—214)

ABSTRACT OF THE DISCLOSURE

The disclosure concerns a dispenser assembly for dispensing fluid from a tube inserted into the dispenser receptacle. A pusher lever is swingable to push against the side of the tube, and also to displace the upright arm of an L-shaped closure for unblocking a dispensing bore in the receptacle, the tube at all times being firmly shouldered in the receptacle.

This application is a continuation of Ser. No. 474,293, filed July 23, 1965, now abandoned.

This invention relates generally to dispensers and more particularly concerns apparatus for dispensing fluid in tubes.

While dispensers as a class are many and varied, they have not to my knowledge provided the unusual combinations and sub-combinations of structural elements, functions and results which characterize the present invention. The latter include the provision of a resilient tube having a neck and a liquid dispenser assembly having an upwardly opening receptacle into which the lower portion of the tube and the neck are downwardly received, the dispenser having a bore receiving the tube neck, the tube typically containing a viscous liquid tending to gravitate toward the neck so that the tube interior above the liquid fills with air as the tube resiliently expands following downward dispensing of liquid from the tube neck, and the dispenser including means having a bore closure and a tube pusher operable in conjunction to urge the closure from closing relation to the bore as the tube is squeezed between the pusher and the receptacle portion of the tube side opposite the pusher to exert compression on the air and liquid in the tube for effecting dispensing of liquid through the bore. The tube liquid may typically consist of viscous detergent or soap substance such as the commercial shampoo product of the Procter & Gamble Company known as Prell Concentrate. It is found that the dispenser cooperation with the resilient tube provides for bubbling of air into the tube after each dispensing stroke of the pusher, the latter creating air pressure in the tube above the liquid, which aids the liquid dispensing function; as to the latter, all of the liquid in the tube may be dispensed even though the pusher does not completely collapse the entire tube.

The above mentioned combinations and sub-combinations may also include the provision of a pusher which comprises a side portion of the receptacle; the provision for free projection of the tube upper portion from the receptacle so that the tube may be grasped for manual turning to effect easy replacement, as by unthreading of the neck of a used tube from the bore and threading into the latter of a new tube neck; the provision of a resilient tube having a removable cap at the upper portion thereof to facilitate refilling of dispensing liquid into the tube; the provision for sealing of the closure against the lower face of the receptacle to block unwanted leakage of liquid from the tube; and certain unusually advantageous features of construction of the pusher and closure, as will appear.

These and other objects and advantages of the invention, as well as the details of an illustrative embodiment,

will be more fully understood from the following detailed description of the drawings, in which:

FIG. 1 is a side elevational view of the tube and dispenser;

FIG. 2 is a frontal view of the tube and dispenser;

FIG. 3 is a horizontal section taken on line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary vertical section showing the dispenser construction;

FIG. 5 is a bottom plan view of the FIG. 1 dispenser;

FIG. 6 is a vertical section taken on line 6—6 of FIG. 4;

FIG. 7 is a vertical section taken on line 7—7 of FIG. 4;

FIG. 8 is a horizontal section taken on line 8—8 of FIG. 4;

FIG. 9 is a view like FIG. 4 but showing the tube compressed by the dispenser pusher; and

FIG. 10 shows a view showing a modified tube having a removable cap.

In FIGS. 1–9 an inverted resilient tube is seen at **10** having a lower neck **11** that is typically externally threaded. The tube may consist of resilient plastic material such as polyethylene or the like, and it typically contains a viscous liquid such as household detergent or soap, as for example the commercial shampoo product of the Procter & Gamble Company known as Prell.

Constructed to cooperate with the particular tube shown and described is a liquid dispenser assembly indicated generally at **12**. The latter includes an upwardly opening receptacle **13** into which the lower portion of the tube including neck **11** is downwardly received, the assembly **12** having a bore **14**, typically internally threaded, to receive the neck **11**. In this regard, the free extent of the tube projecting upwardly from the receptacle facilitates ease of manual unscrewing and upward removal of a spent tube, as well as downward insertion and threading in of a new tube. The tube upper end **15** is typically sealed.

The dispenser receptacle **13** may be internally downwardly tapered at **16** for helping to vertically orient the tube **10** upon tightening of the neck **11** into bore **14**. In this regard, the lower lip of the neck bottoms at bore annular ledge **100**. The receptacle side wall **18** is generally cylindrical to snugly confine the tube **10**, and the top rim **19** of the receptacle may slope downwardly and frontwardly toward the user, thereby to expose an upwardly projecting handle **20** of a tube pusher **21**. The handle may be convex toward the tube **10** as seen in FIG. 9 for compressing the tube laterally and rearwardly toward the rear portion **22** of the dispenser wall. In this regard, one unusually advantageous way of mounting the receptacle to a wall **24** as for example in a shower stall includes the downwardly tapered dovetail connection indicated at **25**. The latter includes a tongue **26** integral with the rear portion **22** of the receptacle wall **18**, and a groove **27** formed in body **28** attached at **29** to the wall **24**. Such attachment may be by fasteners as shown or a suitable adhesive. Tongue wings **26***a* interengage the groove forming wings **30**, and both tongue and groove taper downwardly as seen in FIG. 5 to limit downward seating of the dispenser as well as facilitating upward detachment thereof from the body **28**.

As will be seen, the dispenser includes means having a bore closure such as **32** and a tube pusher such as **21** operable in conjunction to urge the closure from closing relation to the bore **14** as the tube **10** is squeezed between the pusher and the receptacle portion **22** at the tube side opposite the pusher, to exert compression on the air and liquid in the tube for effecting downward dispensing of liquid through the bore, as is seen at **33** in FIG. 9. In this regard, the tube interior above the liquid remaining

in the tube fills with air as the tube resiliently expands following a dispensing stroke of the pusher **21**, air bubbles entering through the tube neck and rising through the remaining liquid in the tube.

An important feature of the invention concerns the use of the pusher **21** as constituting a side portion of the container. FIGS. 2 and 3 indicate this function of the pusher, with the receptacle wall portions **18***a* at opposite sides of the pusher acting to hold the tube **10** in upright position.

The above mentioned closure **32** has an upper face **39** that may be formed on plate **40**, and it is carried to slide adjacent the receptacle lower face **41** through which bore **14** opens. Such sliding occurs as the closure is displaced into and out of closing relation to the bore, as for example between the closed position of FIG. 4 and the open position of FIG. 9. Faces **39** and **41** extend sufficiently about the bore opening in FIG. 4 as to establish a seal against leakage from the dispenser of the liquid contents of the tube **10**. In this regard, the side edges **43** of plate **40** are guided in grooves **44** of the receptacle boss **45** outwardly of the seal, to maintain faces **39** and **41** in close proximity. Edge **45***a* of the plate acts as a knife to cut off the outward flow of dispensed liquid upon release of the handle **20** from FIG. 9 configuration.

The closure **32** may be formed as a bracket one arm of which is formed by plate **40** and the other right angular arm **46** of which extends upwardly at the pusher side of the receptacle. The pusher **21** may have fulcrum pivot mounting **47** to the receptacle so that lever extent **48** of the pusher is provided to displace the closure bracket arm **46** to FIG. 9 position as the pusher is urged into squeezing relation to the tube. Sliding and pushing contact of the lever with the arm **46** is had at **49**. A return spring **50** concealed within the receptacle is connected to post **51** on the closure **32** and post **52** on the receptacle body to return the closure into closing relation with the bore **14**. Thus, the complete dispenser need include only three molded plastic parts (receptacle **13**, pusher **21** and closure **32**). Arm **46** is received between wall extensions **54** and **55** as seen in FIG. 8. Closure reinforcement ribbing is seen at **56**.

The receptacle contains interior hollowness at **57** which is vertically perforated at **58** for draining any shower stall water that may enter the receptacle. The plate **40** contains matching perforations **59** for draining the water, as indicated in FIG. 7.

FIG. 10 shows an alternate form of tube **10***a* having a removable cap **60**. Thus, refill liquid may be poured into the tube without requiring its replacement. The cap may be attached to the tube as by threads **61** to prevent internal air pressure lifting of the cap off the tube during dispensing.

I claim:

1. For combination with a resilient plastic tube having a threaded neck and a frusto-conical shoulder proximate said neck, an improved dispenser assembly for dispensing liquid from said tube comprising

(a) an upwardly opening receptacle having a reduced through bore that is internally threaded to receive

said neck, an enlarged upright bore sized to closely receive said tube and an internal taper to locate said tube shoulder, the receptacle having a front opening interrupting said enlarged bore at the front side thereof,

(b) a closure including a plate carried by the receptacle for frontward and rearward movement directly beneath said reduced bore to control escape of tube liquid therethrough,

(c) a pusher lever having operative connection with said closure at the front side of the enlarged bore and being pivotally carried by the receptacle to swing about a horizontal axis and between retracted position in which the lever has an upper portion projecting above the frontal top level of the receptacle and adjacent the tube, and advanced position in which said lever upper portion is displaced into said tube and toward the rear side of said enlarged bore which also projects above the frontal top level of the receptacle, the closure plate blocking said reduced bore in lever retracted position, and unblocking said bore in lever advanced position, and

(d) the receptacle having a lower face through which said reduced bore opens, the closure having an upper face carried to slide adjacent said lower face, the closure being L-shaped to define an upright arm integral with said plate and extending at the front side of the receptacle, the lever upper portion being convex toward said tube to collapse the tube side inwardly and downwardly in said advanced position, the lever having a lower portion projecting at the bore side of said arm for upward sliding engagement with the inner upright side of said arm to displace the closure frontwardly upon lever swinging toward advanced position, the lower terminal of the lever remaining above said plate, and a return spring concealed by said closure proximate the lower terminal of said lever and connected to urge the closure toward said retracted position.

2. The combination of claim **1** including said tube received in the receptacle and having an upper portion freely projecting upwardly from within the receptacle, and viscous liquid detergent in the tube.

3. The combination of claim **2** including a removable cap carried by said upper portion of the tube.

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N. L. STACK, *Assistant Examiner.*