

Dec. 23, 1947.

J. SHAW

2,433,242

COMBINATION SEAL, DRIP TUBE, AND DISPENSING UNIT

Filed Dec. 3, 1945

2 Sheets-Sheet 1

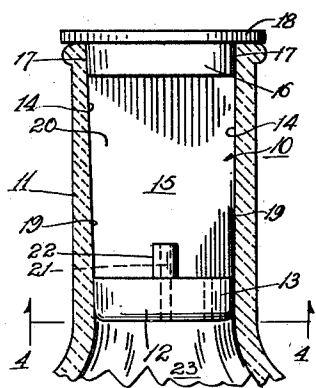


Fig. 1.

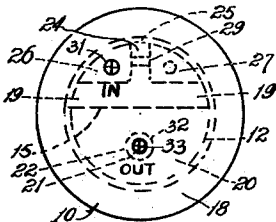


Fig. 3.

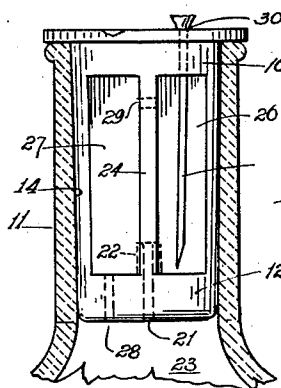


Fig. 2.

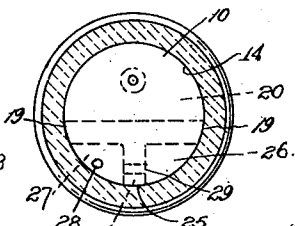


Fig. 4.

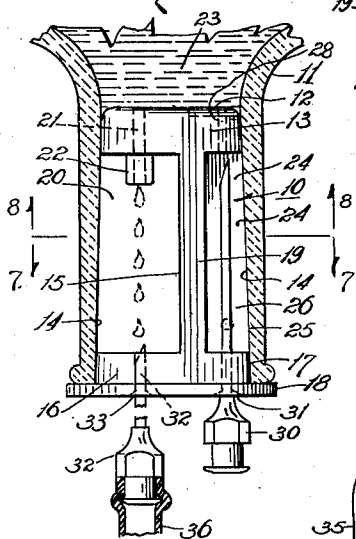
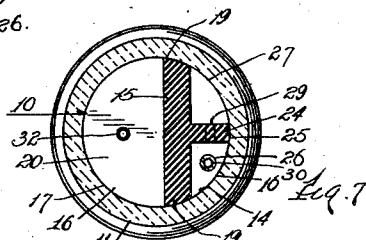


Fig. 5.



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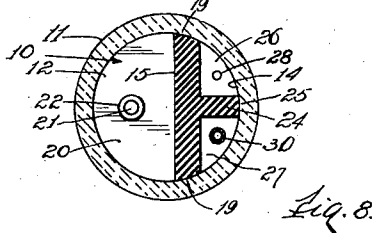


Fig. 8.

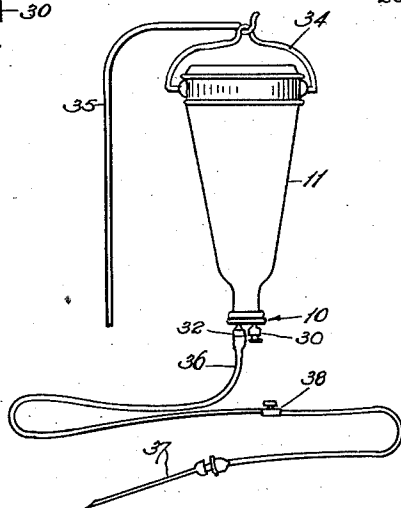


Fig. 6.

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2 Sheets-Sheet 2

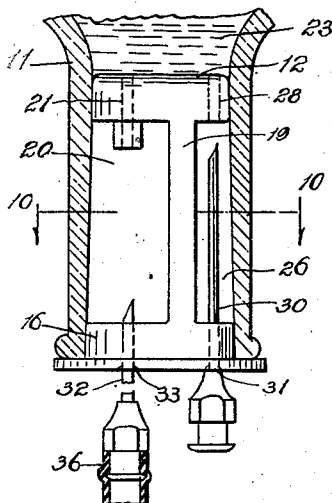


Fig. 9.

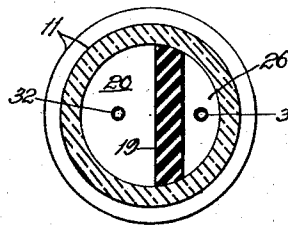


Fig. 10.

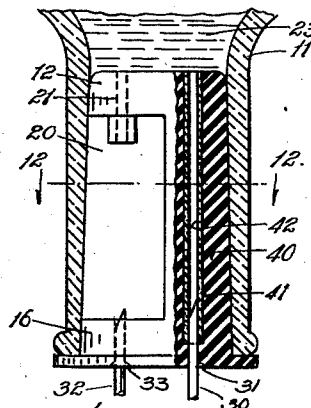


Fig. 11.

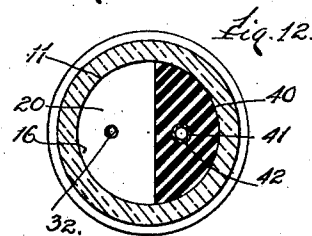


Fig. 12.

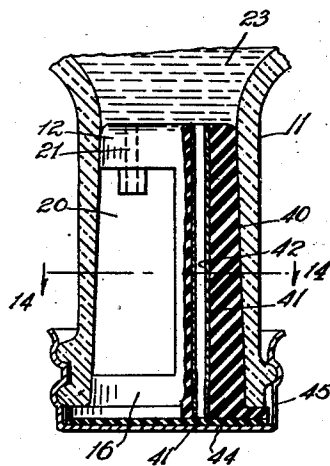


Fig. 13.

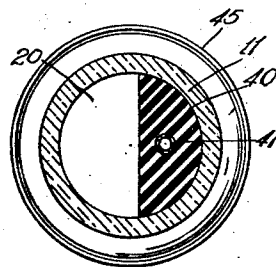


Fig. 14.

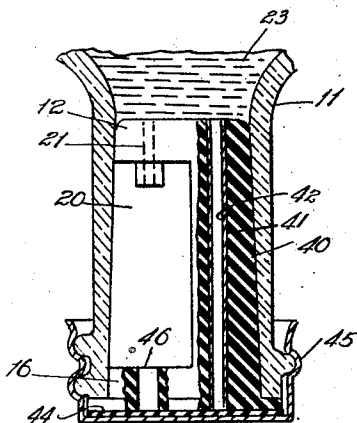


Fig. 15.

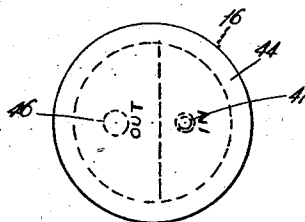


Fig. 16.

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UNITED STATES PATENT OFFICE

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COMBINATION SEAL, DRIP TUBE, AND DISPENSING UNIT

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Application December 3, 1945, Serial No. 632,478

2 Claims. (Cl. 128—214)

1

This invention relates to a unit adapted to seal a bottle containing liquid, and when desired to provide air to said bottle so that the liquid therein may be dispensed, and in the same combination to supply the features and advantages of a visible drip tube.

It is among the objects of my invention to provide a unit which may readily be attached to a container containing liquid, to seal the container, said unit having means for providing air for the bottle to displace the liquid therein and permit the liquid to flow therefrom. It is also among the objects of my invention that my unit shall be so constructed that the air will pass through the liquid in a wash chamber before it passes into the container. Another object is to so construct my unit that it also functions as a visible drip tube. Thus I have a combination unit adapted to seal a container, to provide washed air to dispense liquid from a sealed container and also to visibly show the flow through a drip tube.

Heretofore users of a dispensing cap could determine the flow of liquid by watching the bubbles appearing on the top surface of the liquid in the container. This was difficult and also uncertain. Tests have been made showing that when the bottle was one-third emptied that the bubbles became irregular and therefore this method of gauging the flow was unsatisfactory.

Another way to determine the flow of the liquid was to obtain and place a Murphy drip or the like in the line of the parenteral administration tubing. This involved a separate member and the problems of assembling and cleaning of parts. During cases of emergency, delay caused by this cleaning and assembling of separate parts is serious, and its avoidance is desired. With my unit having a drip tube portion this need of assembling and the consequent delay is avoided.

My invention also contemplates such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings a preferred form of my invention, yet I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings, Fig. 1 is a front elevational view of one embodiment of my unit positioned in the neck of a container shown in section; Fig. 2 is a rear elevational view of the same; Fig. 3 is a top plan view; Fig. 4 is a bottom plan view on line 4—4 of Fig. 1; Fig. 5 is a side elevational view in use; Fig. 6 is a front elevational view of the complete apparatus; Fig. 7 is a sectional view on line 7—7 of Fig. 5; and Fig. 8 is a sectional view on line 8—8 of Fig. 5; Fig. 9 is a sectional view of another embodiment; Fig. 10 is a sectional view on line 10—10 of Fig. 9;

2

Fig. 11 is a sectional view of another embodiment; Fig. 12 is a sectional view on line 12—12 of Fig. 11; Fig. 13 is a sectional view of another embodiment; Fig. 14 is a sectional view on line 14—14 of Fig. 13; Fig. 15 is a sectional view of another embodiment; and Fig. 16 is a top plan view.

The embodiment selected to illustrate my invention comprises a body member 10 made of rubber or other suitable material, adapted to be attached to a transparent bottle or other suitable container 11 containing sterile liquid to be dispensed for parenteral injection. The body member 10 has a bottom 12 with side walls 13. Extending upwardly and integrally from the bottom 12, slightly beyond the center thereof, is a wall 15. Said wall 15 ends at slightly beyond the center of integral top portion 16, leaving space between bottom and top portions 12 and 16. Top portion 16 has side walls 17 and an overhanging flange 18. The side walls 17 engage the walls 14 within container 11 and flange 18 rests on top of side walls 14. The outer portions 19 of wall 15 also engage walls 14 so that the space between bottom and top portions 12 and 16 and walls 14 and 19 forms liquid flow chamber 20.

On the side of wall 15, opposite to liquid flow chamber 20, the space between top and bottom portions 16 and 12, is divided by integral partition 24, extending from bottom portion 12 to top portion 16. Said partition 24 is integral inwardly with wall 15 and its outer portion 25 engages the interior of walls 14 of container 11. This provides an air inlet chamber 26 and an air wash chamber 27. The bottom 12 in air wash chamber 27 has an opening 28 therethrough, providing communication between air wash chamber 27 and the interior 23 of container 11. Adjacent the top portion of partition 24, a hole 29 extends therethrough to provide communication between air wash chamber 27 and air inlet chamber 26.

At the laboratory, my container 11 is filled with suitable solution, and the body member 10 is placed in position in the neck of the container 11 with side walls 17 of top portion 16, outer portions 19 of wall 15, and outer portion 25 of partition 24, engaging the inner walls 14 and flange 18 on top of wall 14 forming a seal therewith.

When a parenteral injection is about to be given, a needle 30 is placed on the spot 31 on top portion 16, suitably marked "In," or the like. This spot 31 is directly above the air inlet chamber 26. The needle is pushed through top portion 16 into air inlet chamber 26, providing communication between air inlet chamber 26 and the atmosphere. This permits passage of air through hole 29 into air wash chamber 27 and through opening 28 into the interior 23 of container 11.

Another needle 32 is placed on spot 33 on top portion 16, suitably marked "Out," or the like. This spot 33 is directly above liquid flow cham-

ber 20. The needle 32 is then pushed through top portion 16 into liquid flow chamber 26, providing communication between needle 32, liquid flow chamber 20, and by opening 21 with the interior 23 of container 11.

The bottle is then inverted and its swingable bail 34 is placed on standard 35. To needle 32 is attached suitable tubing 36 and attached at the opposite end for a parenteral injection, is injection needle 37.

Air coming from the atmosphere passes through air needle 30 into air inlet chamber 26 and through hole 29 into air wash chamber 27, thence through opening 28 into the interior 23 of container 11. This permits flow of the liquid in container 11 down through liquid opening 21 and tip 22 to liquid flow chamber 20. As the liquid drips from tip 22, into liquid flow chamber 20, its dropping, or rate of flow, is visible through transparent wall 14. The liquid passes downwardly through liquid flow chamber 20 into needle 32, through tubing 36 and needle 37 into the patient. A clamp 38 is attached to tubing 36 for regulation of the flow of the liquid.

Liquid also passes downwardly through air inlet hole 28 into air wash chamber 27 so that air coming into air wash chamber 27 passes through said liquid before it passes through opening 28 into the container 11.

In another embodiment of my invention shown in Figs. 9-10, my disclosure differs from that shown in Figs. 1-8 in that I omit partition 24 providing a single air chamber 26 adapted to receive air from needle 30. The bottom 12 of chamber 26 has opening 28 communicating with the interior 23 of container 11.

In another embodiment of my invention shown in Figs. 11-12, body member 40 is so formed as to fill the space cut away to form one or more air chambers in body member 10 in the embodiment shown in Figs. 1-8. An opening 41 extends vertically in body member 40 from adjacent its top to the bottom, in which is housed by friction grip a tube 42 of glass or other suitable material. Top 16 of body member 40 is marked "In" or other suitable indicia just above tube 42 so that air needle 30 may be pushed through top 16 into tube 42. As the bottom of tube 42 is open, communication is provided with the interior 23 of the container 11 to supply air to displace the liquid to be removed for an injection. A variation of this embodiment as shown in Figs. 13-14 is to have opening 41 extend through the top 16 of body member 40 with the tube 42 within said opening 41. A covering 44 keeps this opening 41 closed and sanitary. The covering 44 is sealed in position by a movable closure 45 attached to the neck of the container 11.

Another variation is to provide top portion 16 with an opening 46 therethrough, leading to the liquid flow chamber 20. This opening would also be covered by covering 44 and closure 45, and upon their removal would be accessible to receive suitable connection with tube 36. This is shown in Figs. 15-16.

Having thus described my invention, I claim:

1. In combination with a container having solution therein and a transparent neck, a member having top and bottom portions and an integral connecting portion, said member of such a size as to be positioned in said neck and seal said container, said connecting portion positioned to leave space on either side thereof between said

top and bottom portions, one of said portions forming with the transparent neck a liquid flow chamber, the other of said portions forming with the transparent neck an air inlet chamber, an opening through said bottom portion leading to said liquid flow chamber, a hole through said bottom portion leading to said air inlet chamber, said top member adapted to be pierced by a needle extending into said air inlet chamber for supplying air from the atmosphere, said top portion also adapted to be pierced by a needle extending within the liquid flow chamber for receiving liquid from said container, said bottom portion having a hollow integral tip extending within said liquid flow chamber and communicating with the opening in said bottom portion so that when the container is inverted the flow of liquid from said tip is visible through the transparent wall of the neck of said container.

2. In combination with a container having sterile injection solution therein, and a transparent neck, a combination sealing, drip tube, dispensing device comprising a horizontal bottom portion, a horizontal top portion spaced therefrom, a vertical wall integrally extending between said top and bottom portions slightly beyond the center thereof, leaving a large space on one side of said wall and a smaller space on the other side of said wall between said top and bottom portions, said top portions having an overhanging flange, said device adapted to be inserted within the neck of a container so that the outer edges of said top and bottom portions and side wall engage the inside walls of said neck and said overhanging flange rests on the top of said neck for sealing said container, said larger space forming with the wall of said neck a liquid flow chamber, said smaller space forming with the wall of said neck an air inlet chamber, said bottom portion having a hole extending therethrough and positioned to provide communication between the interior of said container and said air inlet chamber, said bottom portion having another opening extending therethrough and positioned to provide communication between the interior of said container and said liquid flow chamber, said top portion having an indication positioned above said air inlet chamber and adapted to receive therethrough a hollow needle to provide communication between said air inlet chamber and the atmosphere, said top portion having another indication positioned above said liquid flow chamber, and adapted to receive therethrough a hollow needle to provide communication with said liquid flow chamber, a hollow tip extending from said bottom portion upwardly within said air inlet chamber and communicating with said opening in said bottom portion so that when said container is inverted and air provided, the flow of liquid from said tip is visible through said transparent wall of the neck of said container.

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