

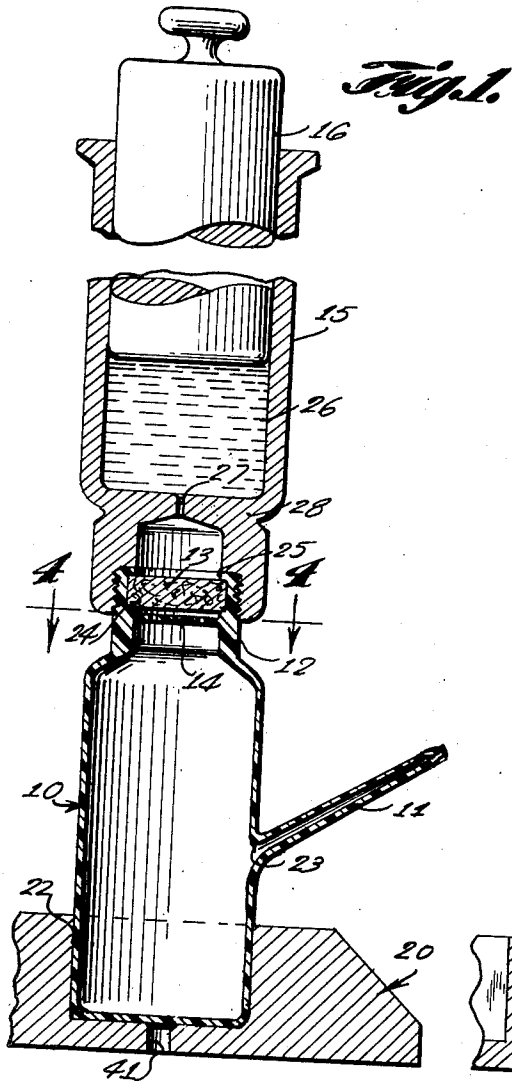
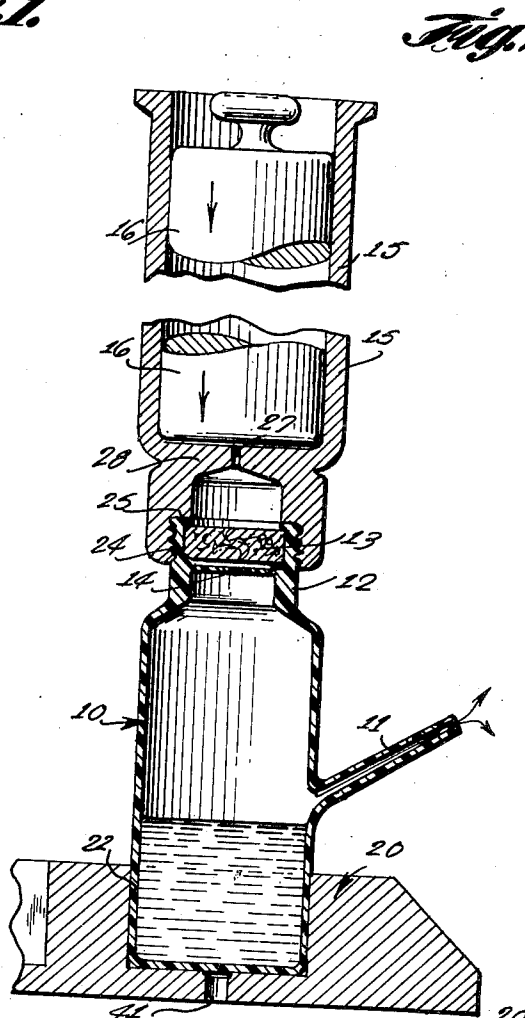
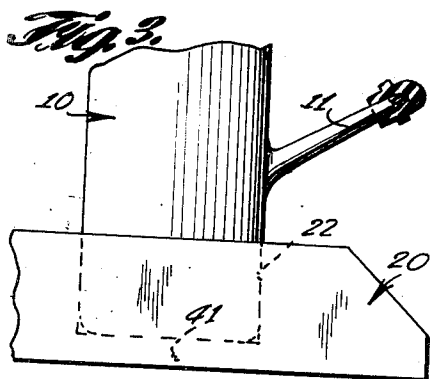
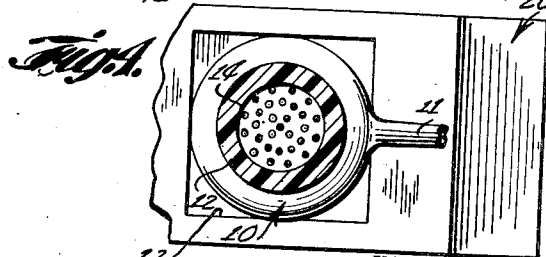
Sept. 24, 1957

R. F. SHEA
STERILE DROP ASSEMBLY

2,807,288

Filed Sept. 1, 1954

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

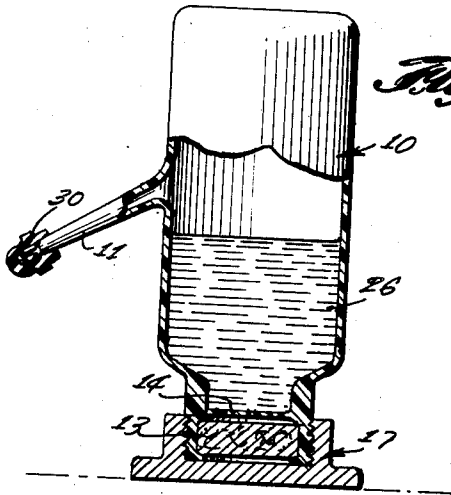


Fig. 5.

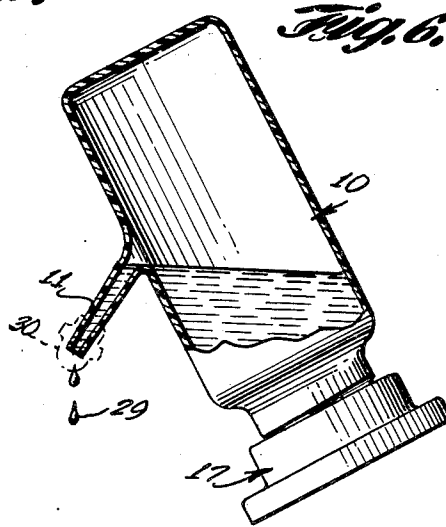


Fig. 6.

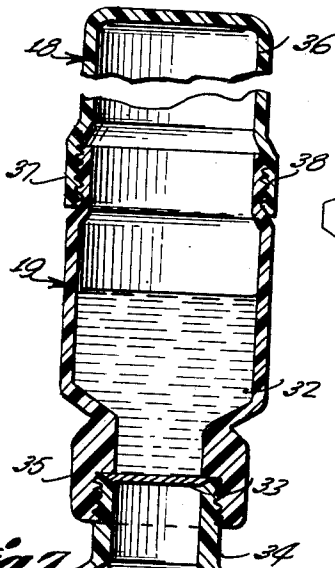


Fig. 7.

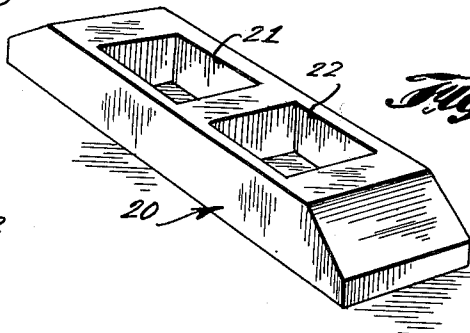


Fig. 8.

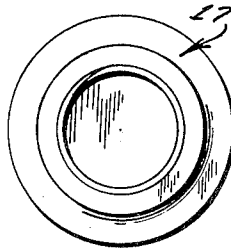
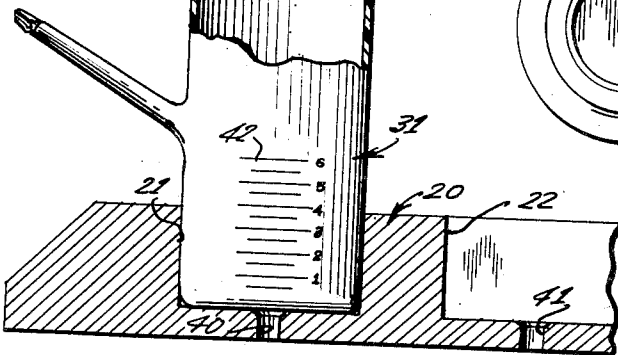


Fig. 9.



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STERILE DROP ASSEMBLY

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Application September 1, 1954, Serial No. 453,528

5 Claims. (Cl. 141-18)

This invention relates to the extemporaneous preparation of bacterially free solutions, the solutions being deposited in pre-sterilized containers through suitable filters and the container being provided with an extended dropper tip which permits the escape of air trapped in the container as the container is filled and which is crimped to avoid contamination as the container is sealed with a stand cover.

The purpose of this invention is to provide an apparatus and procedure for the rapid extemporaneous preparation of solutions, filtered free from bacterial as well as other materials of filterable characteristics and being particularly adapted for preparation of solutions for eye, ear and nose drop use.

Various methods have been used for filling containers with bacteria-free solutions, however, it is difficult to prevent the admission of bacteria in the filling operation and, consequently, it is difficult to obtain containers of materials that are completely bacteria free. With this thought in mind, this invention contemplates a container of resilient material or of the collapsible tube type in which a dropper, arm or spout extends from one side and in which a solution-containing vessel is threaded on the upper end whereby with the solution forced through filtering elements with a plunger or weight materials that are substantially bacteria free may be forced into a container and substantially sealed therein.

The object of this invention is, therefore, to provide a vessel and a method for filling the same in which a substantially bacteria-free solution may be provided in the container or vessel.

Another object of the invention is to provide a container for bacteria-free solutions in which the container is adapted to be inverted to provide a dropper tip when it is desired to remove solutions therefrom.

A further object of the invention is to provide an improved method for the extemporaneous preparation and use of bacterially free solutions in which the solutions are deposited and stored in pre-sterilized containers and in which the manufacture of the containers is substantially simple and inexpensive.

With these and other objects and advantages in view, the invention embodies a container constructed of a suitable squeezable material having an angularly disposed dropper tip or spout extended from one side and having filtering elements in an externally threaded neck on the upper end and means for attaching supply containers to the upper end with the container positioned in an open pocket in a stand.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a vertical section with parts broken away showing the improved bacteria-free container positioned in a pocket in a stand and having a supply container threaded on a neck at the upper end with parts of the supply container and a weight positioned therein broken away.

Figure 2 is a vertical section, similar to that shown in Figure 1, also with parts broken away and showing the assembly with the solution deposited into the lower container.

Figure 3 is a detail showing a side elevational view of one end of a supporting stand with the lower end of a container positioned therein and with a sealing cap crimped on the dropper tip or spout extended from the container.

Figure 4 is a plan view looking upon the upper end of the container with the supply container removed and with parts of the stand and dropper tip broken away.

Figure 5 is a side elevational view of the container with parts broken away showing the lower part of the container, filter elements, and a stand cap threaded on the neck of the container in section.

Figure 6 is a view similar to that shown in Figure 5 with the lower part of the container and stand cap shown in elevation and with the body of the container shown in section.

Figure 7 is a vertical section through the upper part of the container illustrating the use of filling containers positioned on the neck of the container of this invention, the container of this invention being shown in a pocket in a supporting stand.

Figure 8 is a detail illustrating a stand adapted to hold a plurality of the containers.

Figure 9 is a plan view looking downwardly upon the upper end of one of the containers.

Referring now to the drawings wherein like reference characters denote corresponding parts, the improved method and the equipment for the extemporaneous preparation of bacterially free solutions of this invention include a resilient or squeezable container 10 having a dropper tip 11 extended from one side and a threaded neck 12 extended from the upper end, a filter 13 mounted in the neck and positioned above a perforated disc 14, a filling container 15 having a weight 16 therein, a cover and stand 17 adapted to be threaded on the neck 12 of the container, filling containers 18 and 19 adapted to be positioned on the threaded neck of the container 10 and a stand 20 having open recesses or pockets 21 and 22 therein which are positioned to receive the lower ends of the containers 10 as shown in Figures 1 and 2.

Although the container 10 is illustrated as being cylindrical, it will be understood that it may be of any other suitable shape in cross section and the container may also be of any suitable size. With the parts as illustrated in Figures 1, 2 and 3, the dropper tip or spout 11 extends from a point 23 in the wall of the container and the perforated disc 14, which extends across the opening in the neck 12, is spaced downwardly from a shoulder 24 upon which the filtering element 13 is positioned. The upper edge of the neck 12 may be peened inwardly providing a small lip or flange 25 for retaining the filter in position.

To place the solutions in the containers, the containers are positioned in pockets, such as the pockets 21 and 22 in the stand 20, the extended end of the dropper tip being snipped off with sterile shears to allow exit of the pressure created in the container and a bacteria-free solution such as indicated by the numeral 26 is forced, by the weight 16, through an opening 27 in a partition 28 through the filter 13 and perforated disc 14 into the lower part of the container 10, as shown in Figure 2.

Upon the completion of this step, the stand and cover 17 is threaded on the neck 12 and the container inverted, as shown in Figures 5 and 6, whereby the solution may be dropped from the dropper tip as indicated by the drops 29.

When a sufficient amount of the solution is dropped from the dropper tip, the cap 30 is secured over the end of the tip thereby sealing the opening.

The bacterially free solution is also adapted to be

3 supplied to a container 31, similar to the container 10, with the containers 18 and 19, the walls of which are adapted to be forced together to force a solution, such as the solution 32 therein, through a filtering element 33 on the end of a neck 34 upon which a neck 35 of the container 19 is threaded and upon forcing the walls of the container 19 toward the center the solution therein is forced through the filtering element 33 and into the container 31.

By the same means, additional material may be supplied by a container 36, an annular flange 37 of which is threaded on a nipple 38 at the upper end of the container 19.

It will be understood that other means may be used for depositing the bacteria-free solutions into the lower container, such as the containers 10 and 31, and with a suitable quantity of the solution in the lower containers, the containers 15, 18 and 19 are removed and the stand cover 17 threaded on the open upper end of a container. The containers may then be placed in the recesses or pockets 21 and 22, or the container may be inverted, as shown in Figures 5 and 6, whereby the material may be dropped through the spout 11.

The recesses or pockets 21 and 22 in the stand 20 are illustrated as being square, however, it will be understood that these recesses may be of any suitable shape or design and, particularly as shown in Figure 7, openings 40 and 41 are positioned in the centers of the recesses and extend to the lower portion of the stand.

With the parts designed and assembled in this manner, it will be understood that the method and equipment of this invention are particularly useful for the extemporaneous preparation of bacterially free solutions, and the solutions may be placed in the container and removed therefrom as desired.

If desired, sterile thickening agents which could not be filtered, such as methyl cellulose or other acceptable agents, could be added, sterile at the time of manufacture, and the volume of the agent specified to allow the proper strength of medicament or other chemical when the solution had been filtered into the container.

The containers 10 may be calibrated as indicated by the numeral 42 in Figure 7, to denote the correct volume content, if desired.

Although the dropper tip 11 is illustrated as extending upwardly from one side of the container 10, it will be understood that it may be positioned at any other suitable point on the container.

With the product used in the container sterile at the time of manufacture and with the container pre-sterilized at manufacture and sealed until products therein are used, any possibility of contamination of the products is substantially obviated.

The container is used, primarily, for the extemporaneous preparation of bacterially free solutions which comprises a first step of forcing a solution from a supply thereof into a container of resilient material, a second step of filtering the solution as it passes from the supply to the container, the container, which is of resilient material, being sterilized at the time of manufacture, and the third step of providing the escape of air from said container.

It will be understood that modifications, within the scope of the appended claims, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A container filler for bacterially free solutions comprising a container of resilient material having a dropper tip extended therefrom and having an exteriorly threaded

neck on the upper end, a perforated disc extended across said neck, a filter positioned in the neck and spaced from the perforated disc, a cap for sealing the dropper tip, a vessel threaded on the threaded neck of the container and extended upwardly therefrom, said vessel having a relatively small opening in the lower end for supplying liquid from the interior thereof to the filter, and pressure means for forcing material from the vessel through the filter.

2. In a container filler, the combination which comprises a container having a dropper tip extended upwardly at an angle from one side and having a threaded neck extended from the upper end, said container being of bendable material, a perforated disc extended across the interior of said neck, a filter positioned in the neck, a vessel threaded on said neck and extended upwardly from the container, said vessel having a comparatively small orifice in the lower end, and a weight positioned in said vessel.

3. In a container filler, the combination which comprises a tubular container of resilient material having a dropper tip extended therefrom, said container being sterilized at the time of manufacture having an upwardly extended threaded neck, a stand having a recess adapted to receive said container and having an opening extended from the recess through the lower surface, and a plurality of vessels of bendable material extended upwardly from said container, one of said vessels being threaded upon the threaded neck of the container and another of said vessels being threaded upon the upper end of the former vessel, the said connections between the containers and vessels being enclosed.

4. In a container filler, the combination which comprises a container having a dropper tip extended therefrom and having a threaded neck on the upper end, said container being of bendable material, a perforated disc extended across the interior of said neck, a filter positioned in the neck, a vessel threaded on said neck and extended upwardly from the container, said vessel having a comparatively small orifice in the lower end, a weight positioned in said vessel, and a stand and having a recess therein for receiving the container for supporting the container in an upright position.

5. A container formed of squeezable material pre-sterilized at manufacture and having a bacterial filter fitted in an inlet passage therein, said container having a dropper tip with an unobstructed passage therethrough extended therefrom and the walls of said container being adapted to be squeezed together.

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