

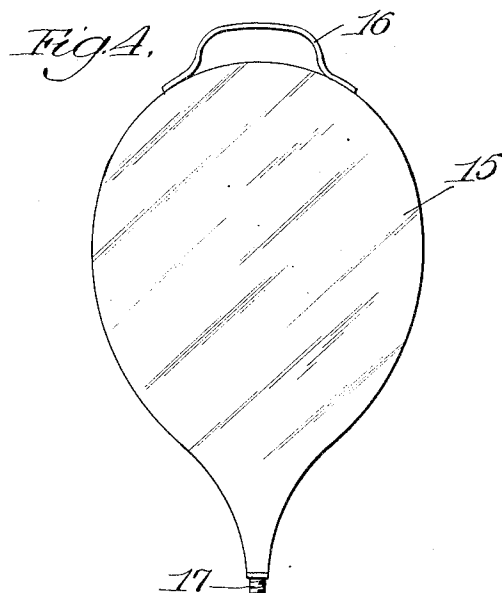
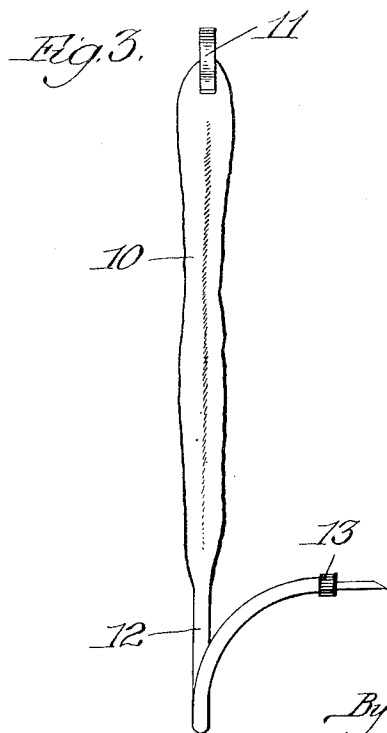
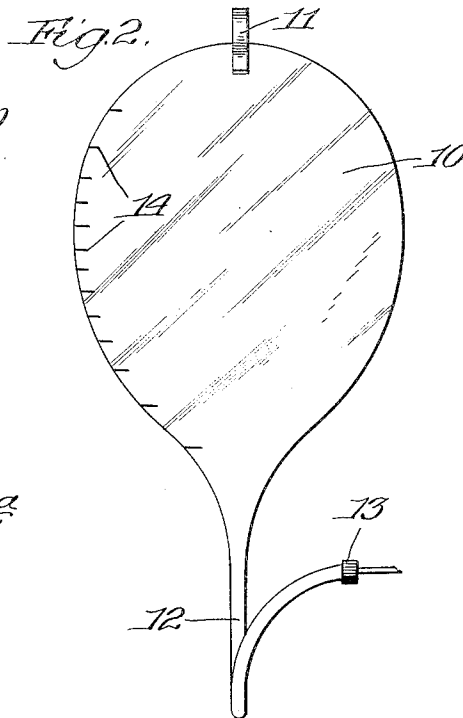
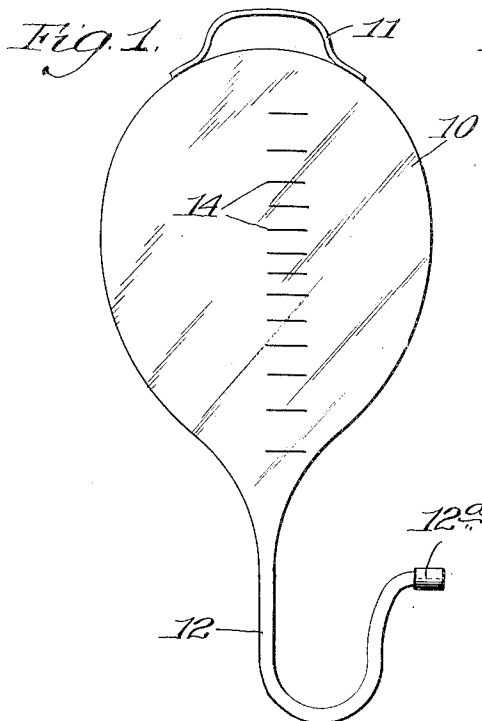
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CONTAINER FOR AND METHOD OF DISPENSING PARENTERAL SOLUTIONS

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CONTAINER FOR AND METHOD OF DISPENSING PARENTERAL SOLUTIONS

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5 Claims. (Cl. 128—214)

This invention relates to a container for and a method for dispensing parenteral solutions and the like. This application constitutes a continuation in part of my application, Serial No. 195,417, which was filed March 11, 1938.

An object of the invention is to provide an extremely simple structure and method by which solutions, such as sterile solutions, may be packaged and then dispensed intravenously or subcutaneously. A further object is to provide a container and method by which solutions may be stored and then dispensed without contact with air and without contamination, the solutions being injected without bringing them into contact with anything more than the container, tube, and dispensing needle. A further object is to provide a container for sterile solutions and other liquids from which the solutions may be dispensed without requiring the introduction of air or other contaminating materials into contact with the liquid. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in preferred embodiments, by the accompanying drawing, in which—

Figure 1 is a side view in elevation of a container embodying my invention, the container being filled with liquid; Fig. 2, an end view of the same; Fig. 3, a view similar to that of Fig. 2 but showing the container empty and the walls thereof collapsed; and Fig. 4, a view similar to Fig. 2, the container being provided with a different form of closure connection.

In the illustration given, I provide a flexible container 10 which is preferably equipped with a handle 11. Integrally formed with the lower part of the container is a conduit tube 12. The end of tube 12 is normally closed by an extremely tight-fitting resilient cap 12^a. This may be formed of rubber or other suitable material and it should grip the end of the tube sufficiently to maintain the contents within the tube while excluding air therefrom. When the cap 12^a is removed, the usual needle unit connection 13 is secured to the tube 12. The container is provided with graduation marks 14 by which the amounts dispensed from the container or remaining in the container can be readily determined visually.

In the modification shown in Fig. 4, the container 15 is provided with a handle 16 and at its lower reduced end is equipped with a closure or plug which may be of hard rubber or other suitable material, the closure being provided with a threaded tube connection 17. The dispensing tube can be readily attached to the threaded or

barbed end 17 and the liquid thereby dispensed. The plug may be secured within the container 15 by a friction-type fit or by the use of cement or other suitable means. A cap, as well be explained hereinafter, is applied to extension 17 during storage and shipment of the filled container.

While the collapsible tube may be formed of any suitable material which is substantially non-reactive with the liquid contents and which permits the liquid to flow readily from the tube, I prefer to employ a material which is also translucent or transparent. For this purpose, I employ a substantially translucent or transparent rubber material or a cellulose film product, such as Cellophane, a gelatin film, or a dried tung oil film. The transparency of the material not only permits the physician to determine the liquid level within the container with respect to the graduation marks 14 but also to inspect the solution and make sure that there are no foreign particles therein.

Since the intravenous solutions consist generally of sodium chloride solutions and dextrose solutions, and sometimes combinations of both, the material employed must be selected with respect to its non-reactance with the particular solution used.

In the use of the container, after the same has been thoroughly sterilized, I introduce the solutions through the tube 12, the needle, of course, being removed. The cap 12^a, which is preferably of a resilient material, such as rubber, is placed in position to close the container and maintain the contents out of contact with the atmosphere. The container is then packaged and shipped. When it is desired to use the sterile solution, the resilient cap 12^a is removed and the needle 13 placed in position, in the usual way. The container is suspended by the handle 11 upon a suitable support and the solution is allowed to flow through the tube 12 and needle 13. As the liquid flows out, the physician can determine the amount by noting the level of the liquid within the container with reference to the graduations 14.

It will be understood that the needle unit need not be attached to the end of tube 12. If desired, the usual glass drip tube for determining the rapidity of flow may be attached to the end of tube 12 and another tube equipped with the needle attached to the glass drip tube. The collapsing of the container and the tube integral therewith, as the liquid flows out, permits the entire contents to be drained without requiring the introduction of air. Thus, there is no contamination of the liquid by contact with any outside medium.

After the container has been filled with liquid and the end of the tube sealed, the container is placed within a sterilizing unit and the temperature is raised to a point that insures sterilization of the liquid. A substantial length of time is sometimes required to bring about a complete sterilization of the liquid. Expansion of the liquid is taken care of by the flexible or resilient character of the walls.

After the package is cooled, it may be packed and shipped to a hospital, etc. At the hospital, the physician, after attaching the needle to the tube 12 and suspending the container upon a hook, etc., places the needle in position within the vein or in the desired location, and the liquid is then allowed to flow therethrough. It is not necessary to introduce air because of the flow of the liquid, since the collapsible walls bring about an even flow. Prior to the injection operation and while the container is suspended, the physician will usually inspect the liquid by looking through the transparent walls of the container, any free particles therein being readily discernible. The accuracy of the examination is enhanced by placing a light bulb behind the container when the liquid is being examined.

The container shown in Fig. 4 operates in the same manner as the container shown in Figs. 1 to 3. The larger opening of the container, however, at the lower end thereof, permits the container to be filled more readily and sterilized more quickly. After the filling of the container, the plug is secured in position and in sealed contact with the opening and then a cap 12^a is placed over the end of the connection 17, the resilience of the cap being sufficient to maintain the contents within the container while excluding air.

It will be observed that in all of the containers described, air is not admitted to the container during the dispensing of the liquid, the collapsing of the walls making this unnecessary, while at the same time the translucent character of the walls permits the physician to determine the correct amount of liquid dispensed to the patient.

While I have set forth certain specific materials as suitable, it will be understood that other materials may be readily substituted. It will be understood that certain metallic materials are better adapted for use where the container, after being filled, is placed within a sterilizer and subjected to a substantial period of heating. However, many non-metallic materials are also adapted to this use.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. Dispensing apparatus for sterile intravenous solutions, comprising: a container having flexible walls which automatically collapse as liquid is withdrawn to permit the ready flow of liquid from the container when the container is inverted,

means for suspending the container, spaced graduations upon a wall of said container adapted to be aligned with the liquid level in said container for determining the amount of liquid withdrawn, said container being provided at its bottom with a tube providing the only outlet and inlet to said container, the walls of said container being transparent to enable the presence of foreign particles to be detected by visual inspection, and a hollow needle secured to said outlet tube.

2. A method for injecting sterile intravenous solutions, comprising: introducing a sterile fluid into a container having transparent flexible walls which automatically collapse as liquid is withdrawn, the container being provided with an outlet tube, hermetically sealing the outlet tube, subjecting the container and fluid therein to temperature conditions over a period of time sufficient to render the contents sterile, opening the end of the tube and securing a hollow needle therein and allowing the liquid to drain from the tube through said needle in the injecting operation.

3. Dispensing apparatus for sterile parenteral solutions, comprising: a container having transparent walls which are flexible and inert, said walls collapsing automatically as liquid is withdrawn to permit the flow of liquid therefrom, said container being provided with an outlet tube adapted to be hermetically sealed and when open to be attached to a hollow needle, spaced graduations upon a wall of said container adapted to be aligned with the liquid level in said container for determining the amount of liquid withdrawn, and means for hermetically sealing the outlet of said container to maintain the contents therein out of contact with the atmosphere about the container.

4. Dispensing apparatus for sterile intravenous solutions comprising: a container having transparent flexible walls which automatically collapse as liquid is withdrawn to permit the flow of liquid from the container, spaced graduations upon a wall of said container adapted to be aligned with the liquid left in said container for determining the amount of liquid withdrawn, said container being equipped with a tube providing the only outlet and inlet to the container, said tube being adapted to be hermetically sealed to maintain the contents of the container out of contact with the atmosphere about the container, and adapted when open to be attached to a hollow needle.

5. Dispensing apparatus for sterile intravenous solutions comprising: a container having transparent flexible walls which automatically collapse as liquid is withdrawn to permit the flow of liquid from the container, said container being equipped with a tube providing the only outlet and inlet to the container, said tube being adapted to be hermetically sealed to maintain the contents of the container out of contact with the atmosphere about the container, and adapted when open to be attached to a hollow needle.

FOSTER G. McGAW.