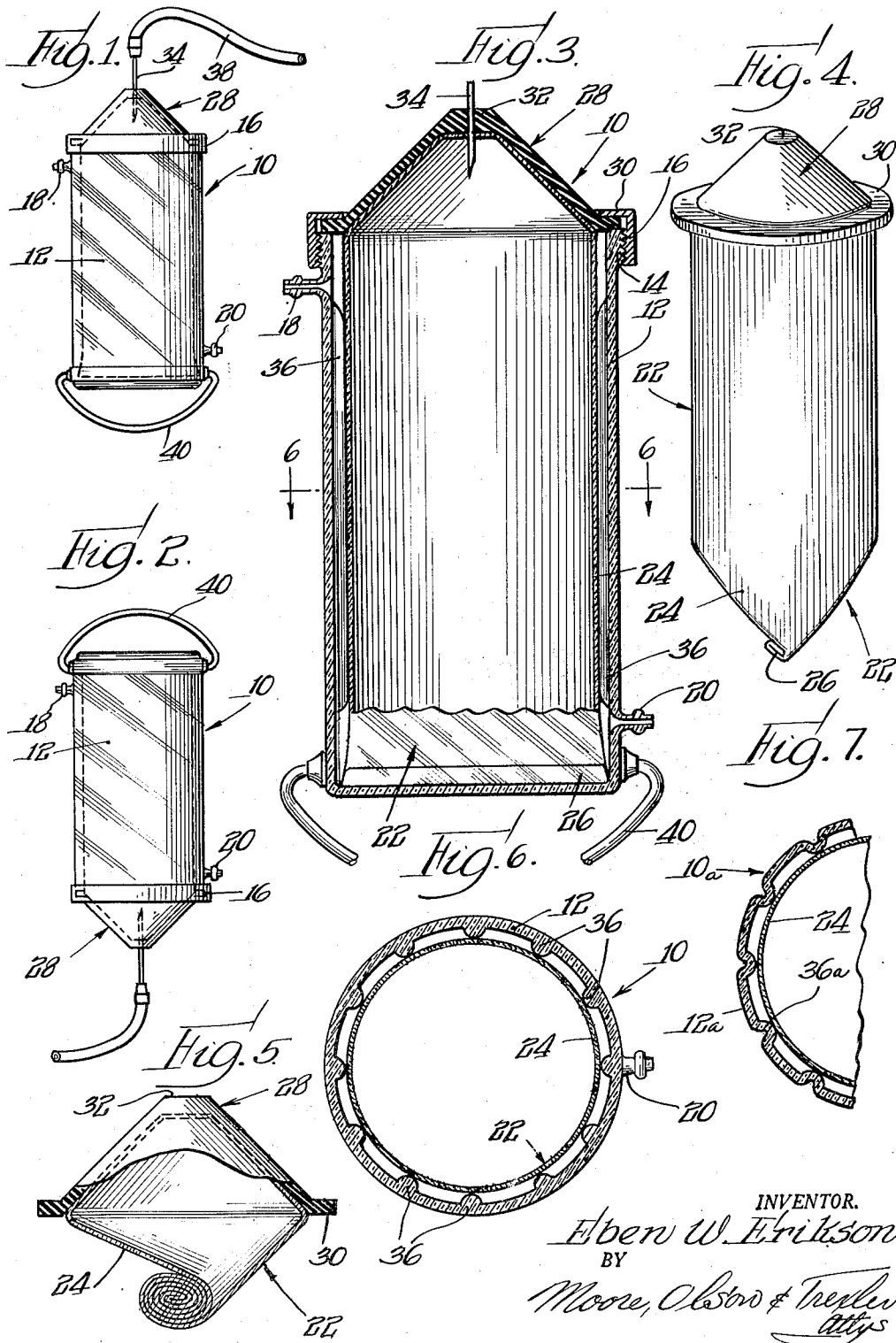


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FLUID RECEPTACLE  
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# UNITED STATES PATENT OFFICE

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## FLUID RECEPTACLE

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This invention relates generally to aseptic fluid receptacles, and more particularly to receptacles employing a relatively inexpensive and disposable fluid container which is internally aseptic.

While the present invention is by no means of limited application, it does have very practical use in the art of blood transfusion, and it is an important object of the invention to provide novel, efficiently usable and extremely practical apparatus for receiving and storing fluids, such as blood, which deteriorate very quickly when exposed to the atmosphere.

It is another object of this invention to provide a receptacle for storing readily deteriorative fluid, including a sealed fluid container made of inexpensive disposable material, such for example as a suitable plastic material, having a readily accessible self-sealing section adapted to be punctured by a needle.

The invention further contemplates a fluid receptacle of the type referred to above in which the internally aseptic sealed container is housed within, and forms a liner for, an outer reusable container, the latter serving to maintain the sealed container in proper fluid receiving or fluid discharging position.

Still another object of the present invention is to provide a sealed, internally aseptic fluid container, as mentioned above, which is collapsible into a small compact non-breakable mass capable of being stored as inventory in a minimum amount of space and easily transportable from the point of manufacture to the point of ultimate use.

The foregoing and other objects and advantages will be more apparent from the following detailed description, when considered in connection with the accompanying drawing, wherein—

Fig. 1 is a side elevational view of a fluid receptacle which is representative of one embodiment of the present invention in position to receive fluid;

Fig. 2 is a side elevational view similar to Fig. 1, showing the receptacle in its inverted fluid discharging position;

Fig. 3 is an enlarged central vertical sectional view of the device as shown in Fig. 1;

Fig. 4 is a perspective view of the inner disposable fluid container detached from the reusable outer container;

Fig. 5 discloses the inner container of Fig. 4 (partially in section), said container being shown in partially collapsed condition;

Fig. 6 is a transverse sectional view taken along the line 6—6 of Fig. 3; and

Fig. 7 is a fragmentary sectional view similar to Fig. 6, disclosing an outer container of slightly modified form.

Referring now to the drawing more in detail,

wherein like numerals have been employed to designate similar parts throughout the various figures, it will be seen that one embodiment of the present invention consists of a receptacle designated generally by the numeral 10. This receptacle 10 includes an outer container or jar 12 which may be made of any suitable material, such as glass, plastic or the like. The container 12 is open at one end and is threaded at 14 to accommodate a complementary annular clamping member or ring 16. The upper portion of the wall of the container 12 is provided with a nipple 18 for accommodating a rubber hose or stopper, and the lower portion of the wall of the container is provided with a similar nipple 20. The use for these nipples 18 and 20 will be more apparent as the description progresses.

Positioned within the container 12 is a second container designated generally by the numeral 22. This container 22 consists of a fluid retaining body portion or bag 24, the lower end of which is sealed as at 26, and the upper end of which is secured to the inner surface of a rubber like cap 28. In the disclosed embodiment the cap 28 is of conical shape, the base of which presents an annular flange 30 extending laterally of the periphery of the bag or sack 24, and the crown 32 of which presents a section for accommodating a sharp instrument such as a hypodermic needle 34. The crown section 32 must be thick enough, and the rubber like material must be such as to render the same self-sealing after the needle 34 has been withdrawn. The flange 30 is designed to be clamped against the upper margin of the container or jar 12 by the threaded clamping ring 16, as clearly shown in Fig. 3. When clamped in this position the bag 24 presents a liner for the inner periphery of the container 12, and in order to maintain spaced relation between the inner periphery of the container 12 and the outer periphery of the bag 24, longitudinally extending ribs 36 are circumferentially spaced along the inner surface of the container 12. This is clearly illustrated in Fig. 6. In Fig. 6 the container or jar 12 is shown as being made of glass or porcelain, whereas in the modified disclosure in Fig. 7 a similar container 12a is shown which may be made of moldable plastic material. In such instances ribs 36a may be molded or pressed inwardly.

With the inner sack or bag 24 secured or clamped in position by the ring 16 as shown in Figs. 1 and 3, the needle 34 may be inserted within the self-sealing cap 32, as shown in Fig. 3. As shown in Fig. 1, this needle 34 may be connected to a blood donor in the usual manner as by means of a flexible tube 38, and a second needle (not shown). Obviously, the bag 24 must be internally aseptic and in instances where desirable a quantity of suitable anti-coagulant may be sealed

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within the bag. Such an anti-coagulant may be placed in the bag at the time of its manufacture just prior to sealing the lower extremity 26 thereof. When the required amount of blood has been withdrawn from the patient, the needle 34 may be removed, and due to the self-sealing characteristics of the crown 32 the blood is completely sealed within the bag. For transfusion purposes it is only necessary to invert the receptacle 10, as shown in Fig. 2, to thereby permit withdrawal of the fluid from the sack 24. A suitable bail 40 connected with the container 12 may be used to support the receptacle in its inverted position. Nipples 18 and 20 may be employed in instances where either vacuum conditions or pressure conditions within the container 12 are necessary to speed the flow of fluid into or away from the fluid retaining bag 24. In instances where gravity feed is sufficient, these nipples may remain open as shown in the drawing. The nipples lend themselves for connection to flexible tubing or rubber stops depending upon the needs incident to their use. After the fluid, such as blood, has been completely withdrawn from the sack 24, this sack and the cap 28 secured thereto may be disposed of. In other words, the invention contemplates the provision of a fluid receptacle, the outer container portion of which may be reusable, but the inner portion disposed of after it has served its purpose.

Attention is also directed to the fact that the disposable container device 22 is preferably collapsible, as shown in Fig. 5. Heretofore, particularly in connection with blood transfusions, jars, such as glass jars, have been employed to receive the blood. After the blood has been withdrawn these jars must be thoroughly cleaned and sterilized. It has not been uncommon to experience considerable difficulty in properly cleansing these jars. Furthermore, jars of this type represent considerable bulk, and hence the shipment thereof represents a considerable item of expense, this being particularly true because of the breakable nature of such containers. Due to the collapsible feature of the fluid accommodating inner container described above, such containers may be shipped in compact form, occupying a minimum amount of space and completely avoiding any hazard of breakage. Furthermore, a relatively large inventory of these containers may be kept without requiring a large space for such storage.

In the manufacture of the inner container or liner, it is proposed to employ a suitable thermoplastic material for the bag portion. The closed end of the bag may be suitably cemented or adhered to the inner surface of the rubber like cap, and a suitable anti-coagulant may be introduced within the flexible bag. Thereafter the open end of the bag may be suitably sealed at 26, after the air has been completely withdrawn from the bag. This sealed end of the bag may be rolled into a compact mass, leaving the end portion thereof and associated self-sealing rubber cap substantially maintained against collapsing as shown in Fig. 5. It will also be understood that the inner surface of the bag must be completely aseptic. This may be accomplished by employing aseptic material for the bag or aseptically treating the inner surface of the bag.

From the foregoing it will be apparent that the present invention facilitates the storage of fluids which have a tendency to deteriorate quickly when subjected to the atmosphere. This is particularly true in connection with the han-

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dling of blood. Furthermore, the invention not only assures storage of fluid free from contact with the atmosphere, but also introduces considerable economy in the handling of such fluids.

That is to say, it makes possible the use of a relatively inexpensive and easily disposable, internally aseptic fluid container, as distinguished from the use of conventional glass jars and the like which are easily breakable and difficult to sterilize. Obviously, the structure of the outer container may be varied to meet the needs for which it is to be used, and likewise the structural details of the internally aseptic container may also be varied depending upon the manner in which it is to be mounted for use. Thus, where the fluid flow to or from the bag 24 is only under gravity feed, it is not necessary to seal the outer container. In other words, changes and modifications are contemplated which come within the scope of the appended claims.

The invention is hereby claimed as follows:

1. A fluid receptacle including an open ended outer container, a second internally aseptic and hermetically sealed inner container forming a removable liner for the outer container and adapted for storing fluid and including a rubber like self-sealing section adapted to be punctured by a sharp instrument such as a needle, for charging the inner container with fluid and discharging fluid therefrom and means disposed peripherally on the inner container and secured thereto and disposed between said inner and outer containers for supporting said inner container in operative position within said outer container with the rubber-like section disposed in an exposed readily accessible position.

2. A fluid receptacle in accordance with claim 1, wherein the means for supporting the inner container in operative position within the outer container includes a clamping member for peripherally clamping said inner container against the outer container.

3. A fluid receptacle in accordance with claim 1, wherein the means for retaining the inner container in operative position within the outer container includes a peripheral projection on the inner container and a member for clamping said projection against the outer container.

4. A fluid receptacle in accordance with claim 1, wherein the inner container includes a readily collapsible portion disposed within the outer container for accommodating the fluid therein.

5. A fluid receptacle in accordance with claim 1, wherein the open ended outer container is provided with peripherally disposed means for permitting communication with the interior of said outer container when the inner container is mounted therein.

6. For use as an inner lining for an open ended receptacle, an internally aseptic and hermetically closed container for accommodating a fluid and including a rubber like self-sealing section adapted to be punctured by a sharp instrument such as a needle and peripherally disposed mounting means laterally offset with respect to the container body wall adjacent the self-sealing section and adapted for cooperation with an outer receptacle for mounting the container thereon.

7. For use as an inner lining for an open ended receptacle, an internally aseptic and hermetically sealed fluid container in the form of a pliable and collapsible normally sealed bag having a section at one extremity presenting a rubber like self-sealing area adapted to be punctured by a

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sharp instrument such as a needle and peripherally disposed mounting means laterally offset with respect to the container body wall adjacent the self-sealing section and adapted for cooperation with an outer receptacle for mounting the container thereon.

8. For use as an inner lining for an open ended receptacle, an internally aseptic and hermetically sealed fluid container in the form of a pliable and collapsible normally sealed bag and including a rubber like self-sealing section at one extremity of said bag adapted to be punctured by a sharp instrument such as a needle, and a peripheral flange positioned in the vicinity of said rubber like section adapted to be gripped for positioning the bag within a receptacle.

9. An open ended container for accommodating a collapsible bag-like fluid container, said open ended container including a threaded periphery in the vicinity of its open end, an internally threaded complementary clamping ring adapted to be received by the threaded portion of said container, said ring including a section extending transversely of the axis of the open ended container for clamping a flange element against the end of said open container, and means including a peripheral nipple positioned adjacent but at a point below the threaded portion thereof for establishing communication with the interior of said open ended container.

10. A container in accordance with claim 9, wherein the means for establishing communication with the interior of the open ended container consists of a pair of axially spaced peripheral nipples.

11. An internally aseptic and hermetically sealed collapsible fluid container adapted for use as an inner lining for an open-ended outer receptacle and comprising a rubber-like self-sealing section intimately connected in surface contact with one extremity of the container and adapted to be punctured by a sharp instrument such as a needle for charging the container with fluid or discharging fluid therefrom, and said

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self-sealing section including a radial flange portion adapted for engagement with an outer receptacle to support said container therein.

12. An internally aseptic and hermetically sealed fluid container for use as an inner lining for an open-ended outer receptacle and comprising a collapsible body portion having an end portion substantially maintained against collapsing and including a rubber-like self-sealing section adapted to be punctured by a sharp instrument such as a needle for charging the container with fluid or discharging fluid therefrom, and peripherally disposed means laterally offset with respect to the wall of said body portion adjacent said self-sealing section adapted for maintaining the container within an outer receptacle.

13. An internally aseptic and hermetically sealed fluid container as claimed in claim 12, and in combination with an outer supporting receptacle, and wherein the end portion including the rubber-like self-sealing section is substantially conical in shape to project exteriorly of the outer receptacle when the fluid container is mounted therein.

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