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BLOOD TRANSFUSION EQUIPMENT

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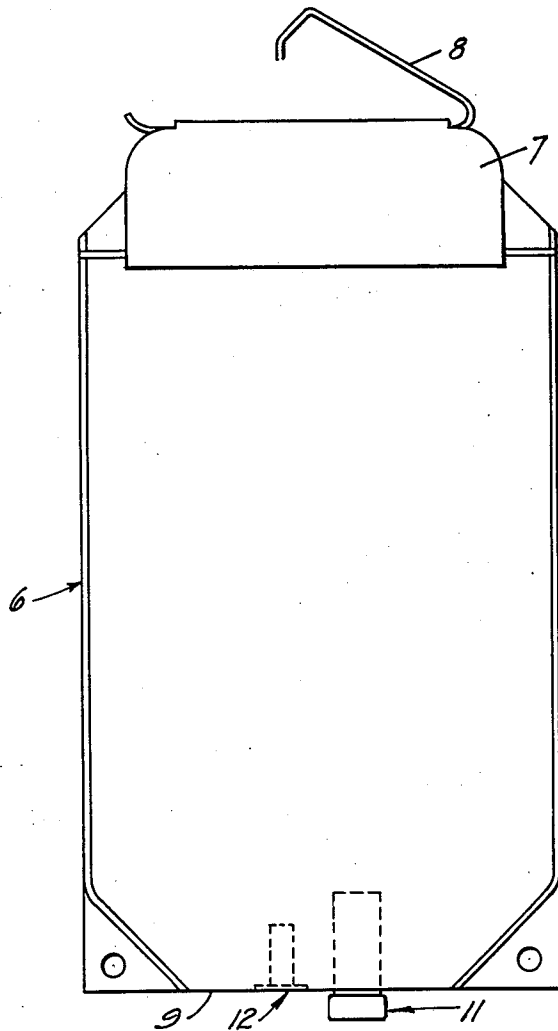


Fig. 1

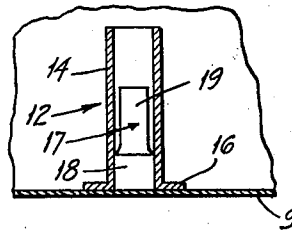


Fig. 2

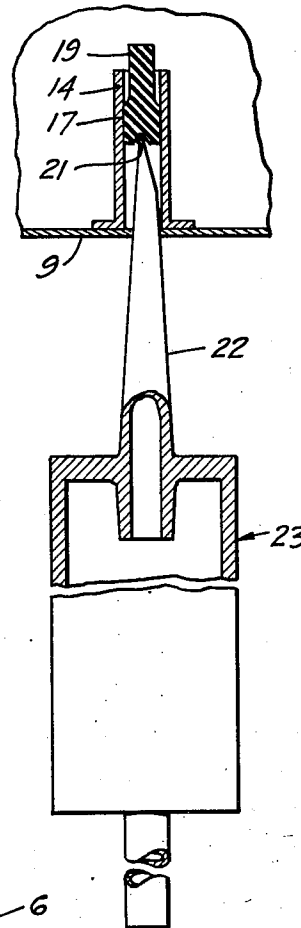


Fig. 3

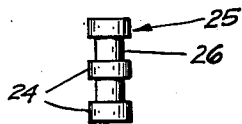


Fig. 4

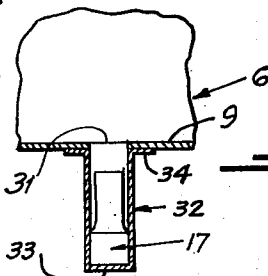


Fig. 5

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BLOOD TRANSFUSION EQUIPMENT

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6 Claims. (Cl. 128—272)

This invention relates to blood transfusion equipment, particularly to an improved flexible container for the storage and dispensing of blood.

While it was formerly the practice to effect a blood transfusion directly from the donor to the patient, of late years the indirect method has been more widely used. In this, a sample of blood from a donor is stored in a glass flask with an anti-coagulant solution until it is desired to use the blood. Because of the fragility of glass, it has been proposed to utilize flexible containers made of polyethylene, vinyl and like materials, having a transparency comparable to that of glass but which are free of the undesirable fragility of glass. The problem of providing a suitable fluid outlet from such a flexible container is, however, one which has never been satisfactorily solved; it will be appreciated that it is desirable to provide a fluid connection to such container for withdrawal of its contents and that this connection must be established and maintained without any loss of fluid in the container and with a continuance of sterile conditions.

It is in general the broad object of the present invention to provide an improved flexible container, particularly one in which an improved outlet from the container is provided, one enabling a fluid connection to be established with the container for withdrawal of its contents in a relatively simple manner, particularly one which ensures preservation of sterile conditions.

A further object of the present invention is to provide a novel outlet from a flexible container of the type described.

The invention includes other objects and features of advantage, some of which, together with the foregoing, will appear hereinafter wherein the present preferred form of flexible container and particularly the outlet therefrom are disclosed. In the drawing accompanying and forming a part hereof,

Figure 1 is a plan view of a flexible container having the novel outlet of the present invention.

Figure 2 is a side elevation partly in section, taken through the fluid outlet.

Figure 3 is a fragmentary view illustrating displacement of the closure means provided.

Figure 4 is a side elevation of a modified form of closure means which can be employed.

Figure 5 is a side elevation partly in section through a modified form of fluid outlet.

Referring to the drawing accompanying and forming a part hereof, I have indicated a flexible container generally at 6, this having a suitable supporting element extending transversely of the top, this being indicated at 7. A hook 8 is engaged with the top support 7 and enables the container to be supported suitably for use.

The container 6 includes a bottom end wall 9 in which is mounted an inlet connection generally indicated at 11 and the outlet 12, which forms a portion of the present invention.

Referring particularly to Figure 2, outlet 12 includes a tubular member 14 having a flange 16 at one end thereof

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and secured by heat sealing, solvent sealing, or the like, to the inside of bottom wall 9 of the container 6. Mounted slidably within tubular member 14 is a piston structure, generally indicated at 17, and comprising a bottom portion 18 fitting the interior of the tube 14 with a sliding fit and being adjacent to the end wall 9, and a stem 19 extending upwardly in the tubular member 14; the plug 17 also includes a central indentation 21.

In use, the container having been filled with blood or the like, and it being desired to give a transfusion, the practice is to force a spike 22 of a drip meter, generally indicated at 23, through that portion of the end wall 9 which covers the plug 17, this area having been previously sterilized and the end of the spike 22 being sterile; the end of the spike 22 is engaged with indentation 21 in the plug. Continued upward forcing movement by the spike 22 forces the plug 17 up the tube and brings the spike into engagement with the side wall of the tube 14. Stem 19 serves as a guide whereby the plug does not tip over if a transverse force is exerted accidentally with the spike 22. By the time the plug is ready to move out of the end of tube 14, the side walls of the spike 22 are firmly in engagement with the side walls of the tube 14 whereby a fluid-tight connection is maintained, and leakage of fluid does not occur between the spike and tube 14.

In the modified form of device shown in Figure 5, an aperture 31 is provided in the bottom end wall 9 of the container 6. A tubular extension 32 is provided exteriorally of the container, being mounted over the aperture 31 by a flange 34 suitably secured on the exterior of the end wall 9. The end of the tubular extension 32 is closed as by an integral frangible wall or diaphragm 33. A plug 17, having the form shown in Figures 2 and 3, is mounted in the tubular extension 32.

In use, the frangible closure 33 is punctured by the end of spike 22 which then enters the tubular extension 32 to force the plug 17 upwardly, the plug emerging from the tubular extension 32 only when the spike 22 is securely engaged with the end of the tubular extension 32.

It is generally desirable, I have found, to relieve the upper end of the plug 17 so that the frictional force required to move the plug through the tube 14 is not too great. This can be achieved in various ways and, for example, in Figure 4 I have shown a suitable plug structure 25 having a plurality of tube engaging flanges 24 thereon, joined together by an interconnecting column 26.

From the foregoing, I believe it will be apparent that I have provided a novel and simple and yet quite effective outlet structure for a flexible container utilized for blood and the like.

I claim:

1. A container for the dispensing of a sterile fluid comprising a flexible sealed bag having a tubular member mounted therein with one end of the member mounted on a bag wall with the member projecting into the bag, and a closure mounted slidably in the tubular member adjacent to said one end of the member and adapted to slide through and out of the tubular member to permit fluid to flow through the tubular member.

2. A container for the dispensing of a sterile fluid comprising a flexible sealed bag having a tubular member mounted therein with one end of the member mounted on a bag wall with the member projecting into the bag, and a flexible plunger closure mounted slidably in the tubular member adjacent to said one end of the member and adapted to slide through and out of the tubular member to permit fluid to flow through the tubular member.

3. In combination, a flexible fluid container, a fluid conduit having a tubular spike of conical form at one end thereof, a tubular member mounted on a wall of the container and adapted to receive the tubular spike in fluid-

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tight engagement upon insertion of the spike into the tubular member to establish a unitary fluid conduit from the container, and a closure mounted in the tubular member and adapted to be moved therein upon insertion of the spike to permit fluid flow from the container into the spike.

4. In combination, a flexible fluid container, a fluid conduit having a tubular spike of conical form at one end thereof, a tubular member mounted on a wall of the container and adapted to receive the tubular spike in fluid-tight engagement upon insertion of the spike into the tubular member to establish a unitary fluid conduit from the container, and a flexible closure slidably mounted in the tubular member adjacent to a wall of the flexible container and adapted to be moved therein upon insertion of the spike to permit fluid flow from the container into the spike.

5. A container for the dispensing of a sterile fluid comprising a flexible sealed bag having a tubular member mounted on a bag wall, and a closure mounted slidably

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in the tubular member adjacent to one end of the member and adapted to be moved in the tubular member to permit fluid to flow into and through the tubular member from the bag.

6. A container for the dispensing of a sterile fluid comprising a flexible sealed bag having a tubular member mounted therein with one end of the member mounted on a bag wall, and a flexible plunger closure mounted slidably in the tubular member adjacent to said one end of the member and adapted to slide through and out of the tubular member to permit fluid to flow into and through the tubular member from the bag.

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