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P. WINCHELL

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DEVICE FOR FILLING BLOOD CONTAINERS

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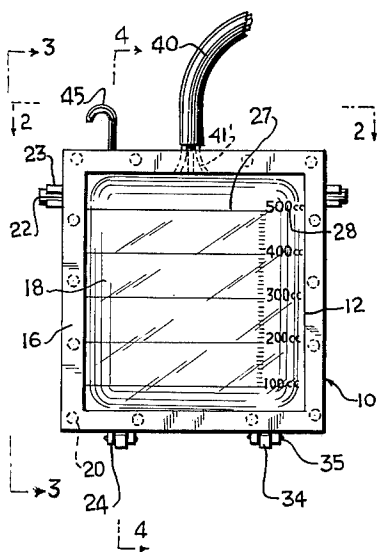


Fig. 1.

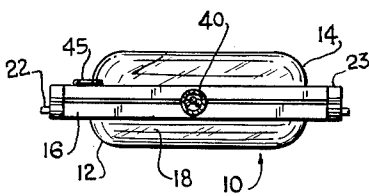


Fig. 2.

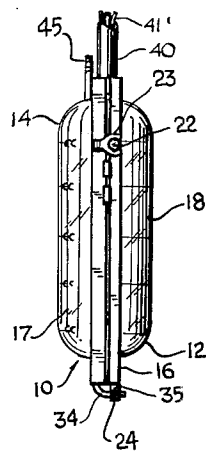


Fig. 3.

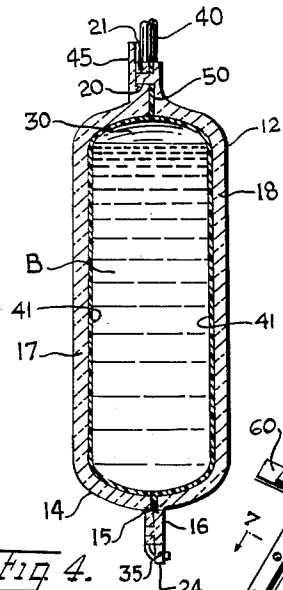


Fig. 4.

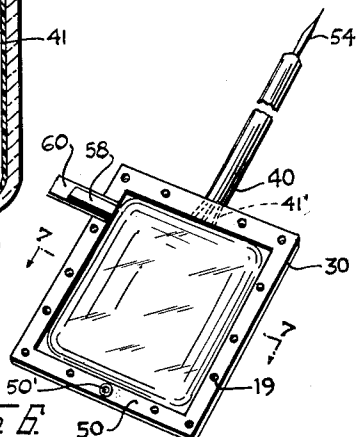


Fig. 5.

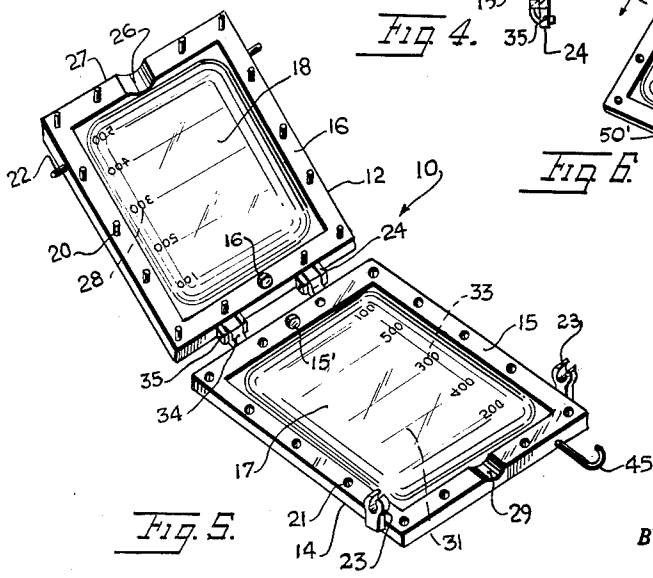


Fig. 6.

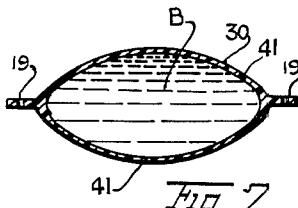


Fig. 7.

INVENTOR.
PAUL WINCHELL

BY

John H. Pollock
ATTORNEY

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DEVICE FOR FILLING BLOOD CONTAINERS
Paul Winchell, Whitestone, N.Y., assignor to Chelwin
Productions, Inc., New York, N.Y., a corporation of
New York

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6 Claims. (Cl. 141-390)

This invention concerns a device for holding a plastic blood container while filling it and for insuring that a measured amount of blood flows into the container.

According to the invention, there is provided a holder for a blood container. The holder includes two hinged dished plates preformed to the shape of a plastic bag filled with the desired amount of whole blood or blood plasma. The plates are formed of transparent, rigid material, such as glass, or a suitable plastic, such as acrylic, Lucite and the like. The plates are provided with rectangular, frame-like margins which abut when the holder is closed. Studs are formed on the margin of one plate which fit into corresponding mating recesses or holes in the other plate. Quick detachable clamping members are provided on the outer edges of the plates to lock the holder in a closed position. On each plate is marked or etched a graduated scale for measuring the quantity of blood in the container. The container is a flexible plastic bag formed of polyethylene or the like. It has tubes connected to one end by which it may be filled or emptied. This container is transparent or substantially so, so that the quantity of blood in the container is visible through the walls of the container and holder. The container has a rectangular margin apertured to engage the studs of the holder.

The container is placed in the holder in an empty flat condition. A quantity of blood then flows into the container through the tube which extends out through the holder. The scales marked on the plates indicate the quantity of blood in the container. The device has particular utility when a donor is contributing blood to a blood bank or the like. The blood flows from the donor under some pressure through the tube to the container. The holder in which the container is supported insures that the flexible container cannot expand more than a predetermined amount and that the quantity of blood in the container is exactly that indicated by the scales marked on the sides of the holder.

It is therefore a principal object to provide a holder for a flexible blood container which limits expansion of the container while being filled to a predetermined volume.

A further object is to provide a holder of the character described including two transparent, rigid dished plates hinged together at one end, the plates being provided with interfitting portions adapted to engage marginal edges of the container disposed therebetween, and with a quick detachable clamping means for holding the plates in a closed abutted position.

Another object is to provide a flexible plastic container for blood, the container having a connected filler tube and an outwardly extending flat margin with spaced holes for engaging studs of a holder of the character described.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a side elevational view of a holder embodying my invention, in closed position on a blood container.

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FIG. 2 is an edgewise top plan view, taken on line 2-2 of FIG. 1.

FIG. 3 is an edgewise elevational view taken on line 3-3 of FIG. 1.

FIG. 4 is a vertical sectional view on an enlarged scale taken on line 4-4 of FIG. 1.

FIG. 5 is a perspective view of the holder per se in an open position.

FIG. 6 is a perspective view of a blood container adapted to be used with the invention and containing blood.

FIG. 7 is a cross-sectional view taken on line 7-7 of FIG. 6.

In FIGS. 1-5, there is shown a holder 10 embodying the invention. The holder includes two plates 12, 14 which are rectangular in form and of the same size. The plate 12 has a rectangular margin 16 and a dished center body portion 18 bulging outwardly of the plane of margin 16, but the body portion may be of other suitable shape. On the inner side of margin 16 there is a plurality of spaced radial studs 20 disposed all around the plate. A pair of cylindrical catch members 22 extend outwardly of opposite edges of the plate 12 adjacent one end. At its other end plate 12 has hinge elements 24. In the margin 16 at its upper end centrally of the body portion 18 there is a semicylindrical recess 26 extending across the margin. On the outer, convex side of the center body portion 18 there is ruled a plurality of lines 27 with indicia 28 indicating the quantity of blood B in a container 30 removably disposed in the holder.

Plate 14 has a rectangular margin 15 with dished center body portion 17 bulging outwardly of the plane of the margin. A plurality of holes 21 are formed in the margin 15 and spaced to receive the studs 20 on plate 12 when the holder is closed. Spring clamp members 23 are secured to or formed on opposite edges of the plate 14 to engage the catch members 22 on plate 12 when the holder is closed. Other suitable latching means besides the catch members 22 and clamps 23 may be used. Hinge elements 34 at the lower edge of plate 14 as viewed in FIG. 1 are engaged by pintles 35 with hinge elements 24 of plate 12. Other means of connection between the hinge elements may be used in place of pintles and in place of hinges. A semicylindrical recess 29 on the central upper edge of plate 14, as viewed in FIG. 1, is adapted to align with recess 26 to form a cylindrical passage for a tube 40 of the container 30. Lines 31 and indicia 33 on the outer convex side of center body portion 17 of plate 14 constitute another scale for indicating the quantity of blood in container 30. A hook 45 may be secured to the upper marginal portion of one of the plates for supporting the holder in a vertical position when closed.

The container 30 as shown in FIGS. 4, 6 and 7, is a flexible transparent plastic bag, having a rectangular frame-like margin 50 corresponding in size to the margins 15 and 16 of the plates 14 and 12, respectively. Holes 19 are formed in the margin 50 in spaced positions corresponding to and registering with the spaced holes 21 and studs 20. The sides 41 of the bag which are sealed all around are generally rectangular and can expand when filled to the bulbous condition shown in FIGS. 4 and 7. A flexible rubber or plastic tube 40 encloses three smaller tubes 41 which are secured to the bag at one end centrally thereof, and which communicate with the interior of the bag. The tube 40 may have a hypodermic type needle 54 inserted into its distal end as indicated in FIG. 6 for collecting from a donor the blood which fills the container and for dispensing the blood to a patient.

In FIGS. 1-4, the holder 10 is shown in a closed operative position with container 30 inserted therein and filled with blood B to a predetermined level measured by the

graduated scales on the sides of the holder. The tubes 41 pass through the opening formed by aligned recesses 26, 29.

In FIG. 5, the holder is shown open and ready to receive an empty plastic bag or container 30 in a flat condition. When the container is placed in the holder, the holes 19 in the bag are aligned with the holes 21 in the plate 14. The plate 12 is then swung closed and the studs 26 inserted through the holes 19 and the clamping members 22, 23 snapped closed together. As blood flows under pressure into the container, its sides expand, but the engaged edges of the container prevent the container from collapsing. The container is held securely and expands to fill the cavity defined by the spaced bulging sides 17, 18 of the plates. The holder limits expansion and insures that a desired measured amount of blood flows into the container. When filling is completed, the holder plates are snapped open and the filled container can be removed. A sample vial 58 containing a sample of the type of blood contained in the container 30 is preferably attached to the margin 50 of the container by means of an adhesive strip 60.

Aligned holes 16' and 15' are formed in the margins 16 and 15 of the plates 12 and 14, respectively, and a registering hole 50' in bag 30, whereby the holder 10 with contained blood bag 30 may be hung upside down for transfusion operations.

There has thus been provided according to the invention, means for holding a flexible container while it is being filled. The marginal parts of the container cooperate with the marginal portions of the holder. The device is economical to manufacture. Its parts are easily sterilized. It is durable and simple to use.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A device for collecting and transmitting blood, comprising a holder including two generally rectangular plates, each of said plates having a rectangular margin, a plurality of spaced studs extending from one side of the margin of one plate, the margin of the other plate having a plurality of spaced studs, said plates being hinged together at corresponding marginal edges, each of said plates having an outwardly bulging center portion, said center portions defining a cavity when the holder is closed with the margins abutted and the studs of the one plate fitted into the holes of the other plate, disengageable clamping means for interlocking the plates together; and a flexible, expansible, transparent container for blood disposed in said cavity, said center portions of the plates limiting expansion of the container when the container is being filled with blood, said container having a rectangular margin interposed between abutted margins of the plates, said margin of the container having a plurality of spaced holes, said studs passing through the spaced holes in the margin of the container, so that the container is prevented from collapsing while being filled with blood.

2. A device for collecting and transmitting blood, comprising a holder including two generally rectangular plates, each of said plates having a rectangular margin, a plurality of spaced studs extending from one side of the margin of one plate, the margin of the other plate having a plurality of spaced studs, said plates being hinged together at corresponding marginal edges, each of said plates having an outwardly bulging center portion, said center portions defining a cavity when the holder is closed with the margins abutted and the studs of the one plate fitted into the holes of the other plate, disengageable clamping means for interlocking the plates together; and a flexible, expansible, transparent container for blood disposed in

said cavity, said center portions of the plates limiting expansion of the container when the container is being filled with blood, said container having a rectangular margin interposed between abutted margins of the plates, said margin of the container having a plurality of spaced holes, said studs passing through the spaced holes in the margin of the container, so that the container is prevented from collapsing while being filled with blood, the abutted margins of the plates having opposed semicylindrical recesses constituting a passage, said container having a filler tube communicating with the interior thereof and extending through said passage.

3. A device for collecting and transmitting blood, comprising a holder including two generally rectangular plates, each of said plates having a rectangular margin, a plurality of spaced studs extending from one side of the margin of one plate, the margin of the other plate having a plurality of spaced studs, said plates being hinged together at corresponding marginal edges, each of said plates having an outwardly bulging center portion, said center portions defining a cavity when the holder is closed with the margins abutted and the studs of the one plate fitted into the holes of the other plate, disengageable clamping means for locking the plates together; and a flexible, expansible, transparent container for blood disposed in said cavity, said center portions of the plates limiting expansion of the container when the container is being filled with blood, said container having a rectangular margin interposed between abutted margins of the plates, said margin of the container having a plurality of spaced holes, said studs passing through the spaced holes in the margin of the container, so that the container is prevented from collapsing while being filled with blood, the abutted margins of the plates having opposed semicylindrical recesses constituting a passage, said container having a filler tube communicating with the interior thereof and extending through said passage, each of the plates being of rigid transparent material so that the quantity of blood in the container is visible through the plates.

4. A device for collecting and transmitting blood, comprising a holder including two generally rectangular plates, each of said plates having a rectangular margin, a plurality of spaced studs extending from one side of the margin of one plate, the margin of the other plate having a plurality of spaced studs, said plates being hinged together at corresponding marginal edges, each of said plates having an outwardly bulging center portion, said center portions defining a cavity when the holder is closed with the margins abutted and the studs of the one plate fitted into the holes of the other plate, disengageable clamping means for locking the plates together; and a flexible, expansible, transparent container for blood disposed in said cavity, said center portions of the plates limiting expansion of the container when the container is being filled with blood, said container having a rectangular margin interposed between abutted margins of the plates, said margin of the container having a plurality of spaced holes, said studs passing through the spaced holes in the margin of the container, so that the container is prevented from collapsing while being filled with blood, there being a passage defined by opposing semicylindrical recesses formed in the abutted margins of the plates having opposed semicylindrical recesses constituting a passage, said container having a filler tube communicating with the interior thereof and extending through said passage, each of the plates being of rigid transparent material so that the quantity of blood in the container is visible through the plates, and graduated scales inscribed on the sides of the plates for measuring the quantity of blood in the container.

5. A device for collecting and transmitting blood, comprising a holder including two generally rectangular plates, each of said plates having a rectangular margin, a plurality of spaced studs extending from one side of

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the margin of one plate, the margin of the other plate having a plurality of spaced studs, said plates being hinged together at corresponding marginal edges, each of said plates having an outwardly bulging center portion, said center portions defining a cavity when the holder is closed with the margins abutted and the studs of the one plate fitted into the holes of the other plate, disengageable clamping means for interlocking the plates together; and a flexible, expansible, transparent container for blood disposed in said cavity, said center portions of the plates limiting expansion of the container when the container is being filled with blood, said container having a rectangular margin interposed between abutted margins of the plates, said margin of the container having a plurality of spaced holes, said studs passing through the spaced holes in the margin of the container, so that the container is prevented from collapsing while being filled with blood, there being a passage defined by opposing semicylindrical recesses formed in the abutted margins of the plates having opposed semicylindrical recesses constituting a passage, said container having a filler tube communicating with the interior thereof and extending through said passage, each of the plates

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being of rigid transparent material so that the quantity of blood in the container is visible through the plates, graduated scales inscribed on the sides of the plates for measuring the quantity of blood in the container, and a hook secured at an upper edge of one of the plates for suspending the holder from a support while the container is being filled with blood.

6. A device for collecting and transmitting blood as defined in claim 5, wherein the plates and container have aligned holes for hanging the holder and container upside down for transfusion operations.

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