

Dec. 31, 1940.

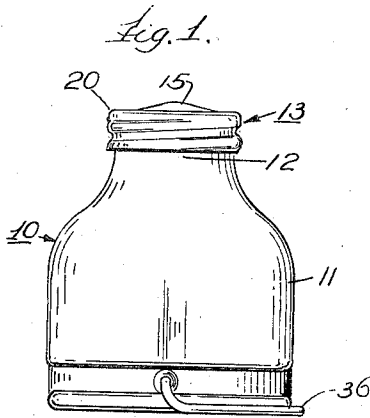
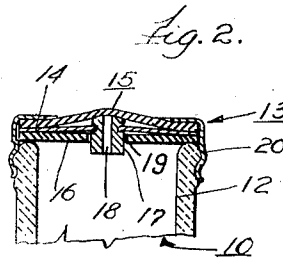
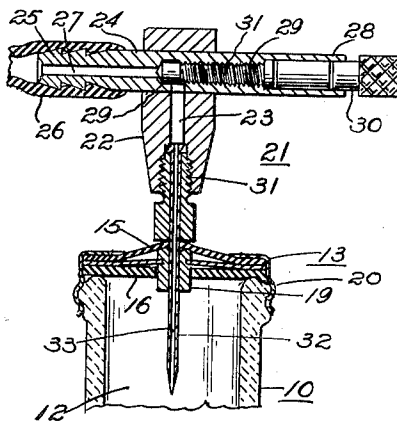
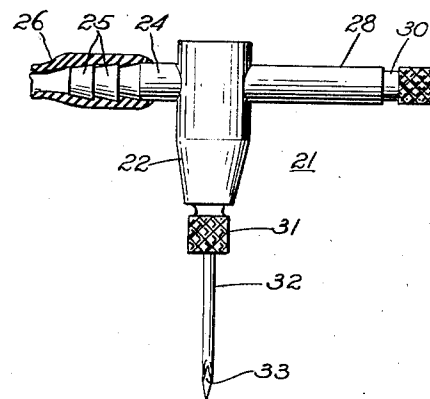
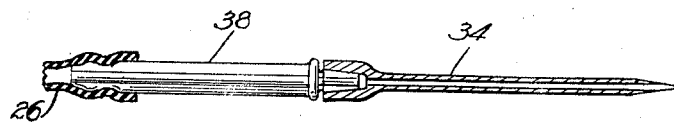
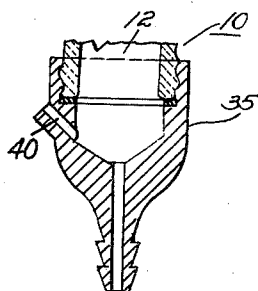
J. E. B. SWABACKER

2,226,538

BLOOD TRANSFUSION DEVICE

Filed March 5, 1940

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

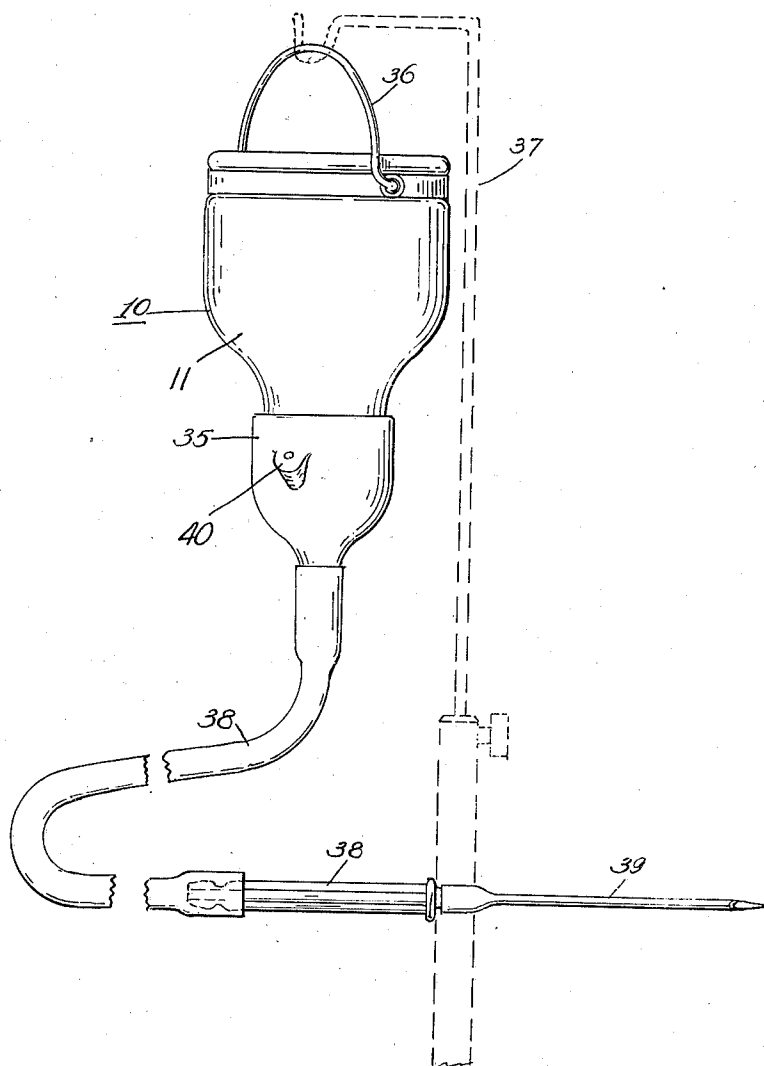


Fig. 7.

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UNITED STATES PATENT OFFICE

2,226,538

BLOOD TRANSFUSION DEVICE

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Application March 5, 1940, Serial No. 322,368

3 Claims. (Cl. 128—214)

This invention relates to a blood transfusion device in which a single container is used.

Among the objects of my invention is to provide a blood transfusion device in which a single container having a partial vacuum is used in combination with an insertable, withdrawal means having a valve control, and to supply a single container for use in receiving, infusing, storing and dispensing in blood transfusions, and such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings a preferred form of my invention, yet I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings, Fig. 1 is a front elevational view of my container; Fig. 2 is a detailed sectional view of the top of the container; Fig. 3 is a sectional view of the valve construction in combination with the container; Fig. 4 is a detailed view of my valve construction; Fig. 5 is a detailed view partly in section of the transfusion needle; Fig. 6 is a detailed sectional view of the dispensing cap; Fig. 7 is an elevational view of my container in combination with dispensing apparatus.

The embodiment selected to illustrate my invention comprises a container 10 having a hollow body portion 11 partially filled with an anticoagulant solution such as a solution of sodium citrate 2½% in physiologic solution of sodium chloride. There is a partial vacuum in the container 10, the open top 12 of which is sealed by a closure 13. The closure 13 has a metal cap 14 and upper and lower washers or liners 15 and 16 respectively, of rubber or the like. Substantially centrally positioned to the under portion of the cap 14 is a stub 17 having an opening 18 extending from the top of the cap down to and through the cap 14 and stub 17. Upper washer 15 is positioned on top of cap 14 to close opening 18. Lower washer 16 has an opening 19 holding said washer under cap 14 by engaging stub 17. A removable soft metal member 20 holds the cap 14 and the washers on the top 12 of container 10.

In cooperation with said container I provide a valve structure 21 having a central longitudinally extending body portion 22 with a passageway 23 therein. Extending laterally from one side of the upper portion of the body member 22 is shank 24 having circular retaining portions 25 for holding the end portion of tube 26 thereon. Said shank 24 has a channel 27 which communicates

with the upper end of passageway 23 of the body member 22. On the opposite side of the upper portion of the body member 22 extends an arm 28 having a screw threaded opening 29 extending laterally across the top of passageway 23 of the body member 22. A screw threaded valve stem 30 is removably mounted within opening 29 of arm 28. The passageway 23 of the body member 22 is screw threaded at its lower portion to receive screw threaded bolt 31 which holds needle 32 to the body member 22. Needle 32 has a hollow conduit 33 leading from its head down through its length to the point thereof. When channel 27 and passageway 23 are in communication, a fluid entering channel 27 may pass into passageway 23. Upon the turning of valve stem 30 within arm 28, stem 30 enters passageway 23 at its top portion and blocks communication of channel 27 with passageway 23.

One end of tube 26 is removably attached to shank 24 and its other end is removably attached to a transfusion needle 34 adapted for insertion into the vein of a donor.

In use of my blood transfusion device, my container 10 containing an anticoagulant such as a solution of sodium citrate, 2½% in physiologic sodium chloride solution, and having a partial vacuum sealed with a closure having a penetrable top, is available. With the valve stem 30 in closed position within arm 28, blocking the top of passageway 23, I insert the valve needle 32 through the penetrable top washer 15, and through opening 18 in the cap 14 and stub 17, into the container 10. The transfusion needle 34 is then inserted into the donor's vein, and the valve stem 30 is slowly turned until channel 27 may communicate with passageway 23. The vacuum in the container by equalizing pressure causes the blood to flow from the transfusion needle 34 through the tubing 26 and valve structure 21 into the container 10. The solution in the container prevents coagulation of the blood. Swirling may be desirable.

The valve needle 32 may be withdrawn and the penetrated upper washer 15 replaced by a new unpenetrated member. The blood may then be stored or transported in the sealed container.

The same container 10 may then upon removal of the closure 13 receive a dispensing cap 35 and be placed in a dispensing position by turning the container 10 upside down and attaching its loop 36 to a standard 37. Air is admitted into the container 10 through an inlet 40 of dispensing cap 35. The blood in the container 10 may then

be passed through a tube 33 and dispensing needle 39 to the donee.

My container 19 is thus used throughout the withdrawal, storing, transporting and dispensing of the blood. There is no change from one container to another, to involve the problems of contamination, loss and extra apparatus.

Where the dispensing to the donee is done immediately following the withdrawal, a second closure for the container is not necessary because the dispensing cap and apparatus may be attached to the bottle upon removal of the original closure.

Having thus described my invention, I claim:

1. A blood transfusion apparatus comprising a container having a desired amount of solution to prevent clotting of blood introduced therein, and a partial vacuum, a lower washer positioned over the open top of said container, a metal cap positioned over said lower washer, a stub extending vertically through said lower washer and said cap, said stub having a guideway opening extending vertically therethrough and leading into the interior of said container, an upper washer formed of penetrable material positioned over said cap and the upper end of said stub and sealing the opening in said stub, removable means for holding said washers and said cap in their respective positions above the top of the container, a tubing, a transfusion needle attached to one end of said tubing, a valve attached to the other end of said tubing, a hollow needle attached to said valve, said needle adapted to penetrate said upper washer and extend through said guideway opening in said stub into said container so that upon the opening of said valve the vacuum in said container will cause blood to flow from the transfusion needle inserted into the veins of a donor, into the container.
2. A blood transfusion apparatus comprising a container having a desired amount of solution to prevent clotting of blood introduced therein, and a partial vacuum, a penetrable closure for sealing said container, a valve structure comprising a central longitudinally extending body portion with a passageway therein, a shank extending laterally from one side of the upper portion of

the body portion and having therein a channel communicating with the upper end of said passageway, an arm extending laterally from the opposite side of the body portion and having therein a screw threaded opening extending across the top of said passageway, a needle attached to the body portion adjacent its lower end, said needle having a hollow conduit extending vertically therethrough and communicating with said passageway, a screw threaded valve stem turnable within the screw threaded opening of said arm to extend across the top of said passageway and block communication of said passageway with said channel, a tubing, a transfusion needle attached to the outer end of said tubing, the inner end of said tubing attached to said shank, said needle adapted to penetrate said closure and extend into said container so that upon the subsequent turning of the valve stem away from the top of said passageway so that said passageway leading through said needle into the container may communicate with the channel, tubing and transfusion needle, the vacuum in said container will cause blood to flow from said transfusion needle which has been inserted into the veins of a donor, into the tubing, channel, passageway and needle to the container.

3. A blood transfusion apparatus comprising a container having a desired amount of solution to prevent clotting of blood introduced therein, and a partial vacuum, a penetrable closure sealing said container, a guide member positioned beneath said penetrable closure, said guide member having a guideway opening extending vertically therethrough and leading into the interior of said container, a tubing, a transfusion needle attached to one end of said tubing, a valve attached to the other end of said tubing, a hollow needle attached to said valve, said needle adapted to penetrate said penetrable closure and extend through said guideway opening in said guide member into said container so that upon the opening of said valve the vacuum in said container will cause blood to flow from the transfusion needle inserted into the veins of a donor into the container.

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