

Nov. 26, 1968

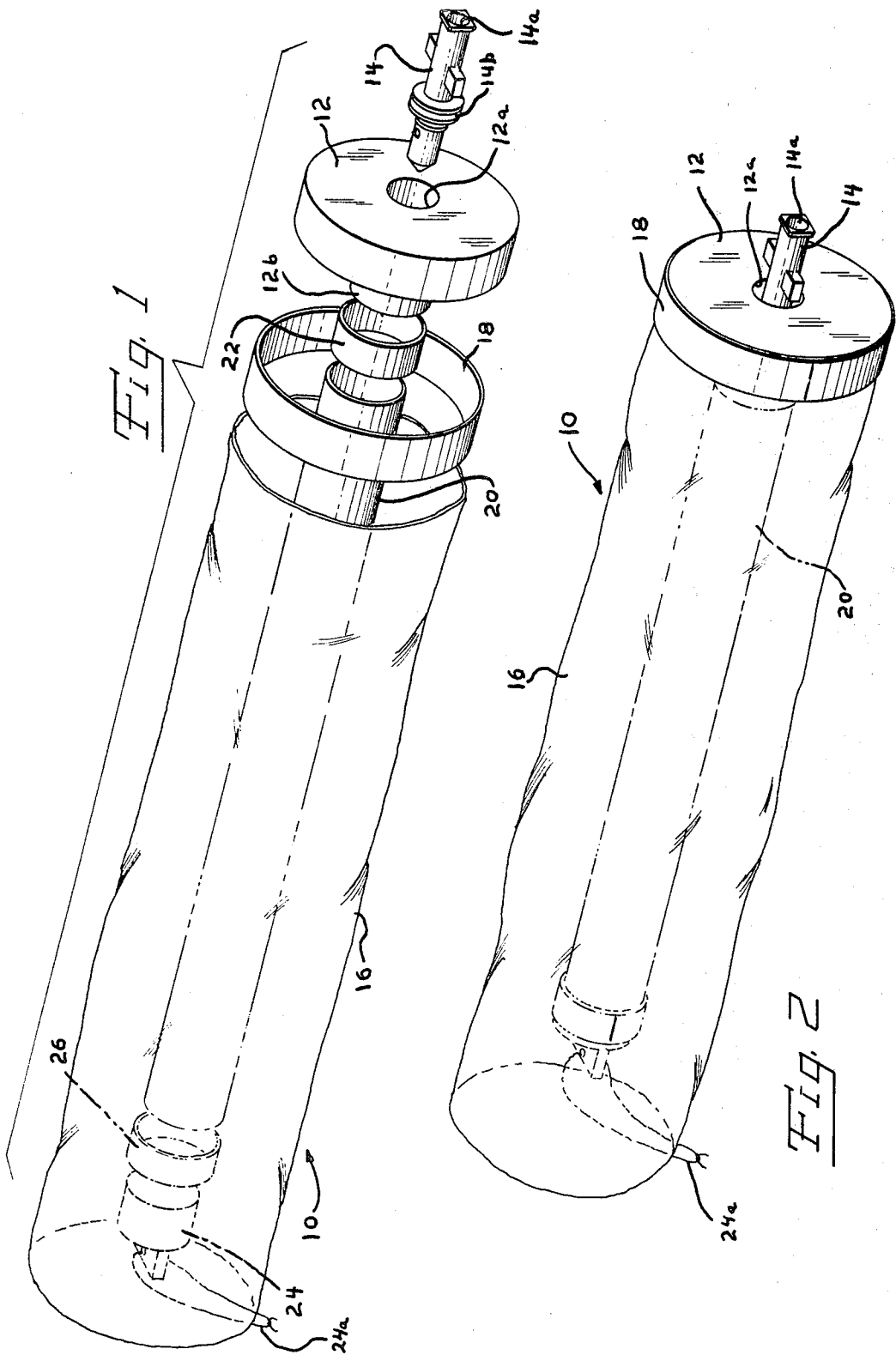
L. J. DINGER

3,412,906

PLASMA INFUSOR

Filed Dec. 5, 1966

2 Sheets-Sheet 1



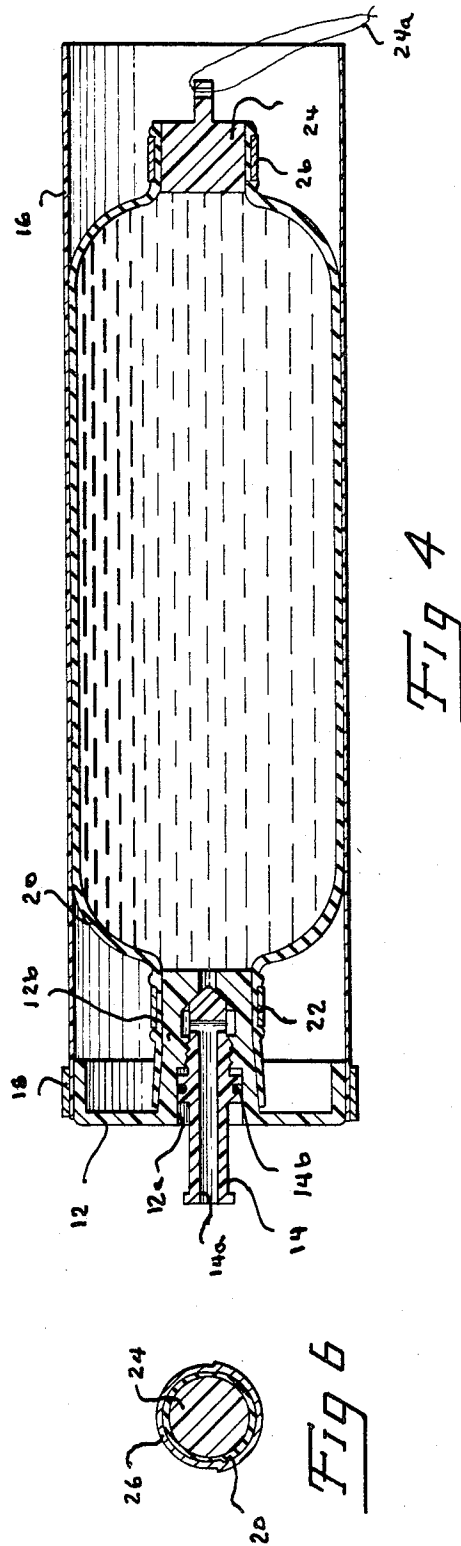
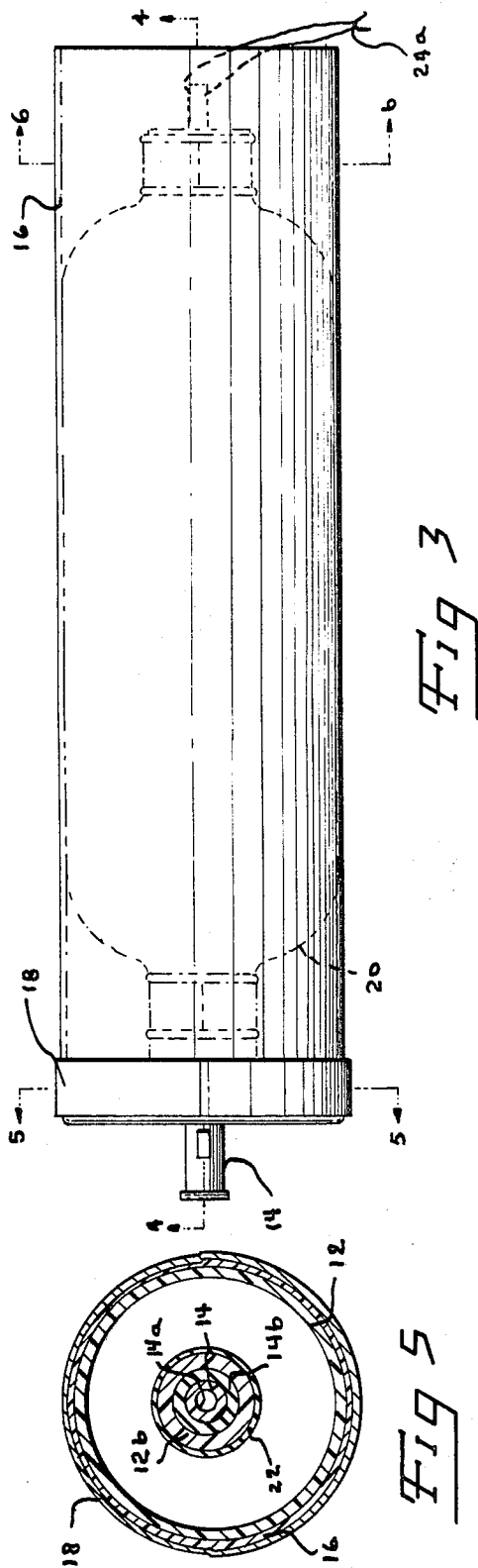
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PLASMA INFUSOR

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1 Claim. (Cl. 222—183)

ABSTRACT OF THE DISCLOSURE

This invention relates to the art of plasma infusors and more particularly to a new and novel device which facilitates emergency blood transfusions.

Brief summary of the invention

Blood transfusions which are given in the field particularly under battlefield conditions normally require that the bag of plasma be held in an elevated position above the patient to provide the energy for moving the plasma from the bag into the patient. These transfusions are often given while the patient is being moved and therefore it is a difficult task to keep the plasma bag in its elevated position. This invention provides a device which is capable of transferring plasma from a bag into a patient without the necessity of elevating the bag thereby permitting the plasma bag to lie immediately adjacent the patient.

Specification

The principal object of the present invention is to provide a plasma infusor which avoids the drawbacks set forth above.

Another object is to provide a plasma infusor which delivers plasma to a patient without the necessity of utilizing potential energy.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described an illustrative embodiment of the invention; it is to be understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention but is given for purpose of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

In the drawings, in which like reference numerals refer to like parts:

FIGURE 1 is a perspective view of a device according to the present invention and showing the device in its unassembled or exploded form;

FIGURE 2 is a perspective view similar to FIGURE 1 and showing the device in its assembled position;

FIGURE 3 is a side elevational view showing the device of FIGURE 2 after the device is filled with plasma;

FIGURE 4 is a cross-sectional view taken along the line 4—4 of FIGURE 3;

FIGURE 5 is a cross-sectional view taken along the line 5—5 of FIGURE 3 and showing details of the valve and seal configuration; and

FIGURE 6 is a cross-sectional view taken along the line 6—6 of FIGURE 3 showing details of a plug and seal.

Turning now to the drawings there is shown a plasma infusor 10 capable of receiving and holding a quantity of plasma for subsequent use during a blood transfusion or the like. The infusor 10 comprises a front plate 12 having an aperture 12a extending therethrough. The plate 12 further has a boss 12b extending therefrom for re-

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taining therein a valve assembly 14. The valve 14 has a passageway 14a therein for permitting the passage of fluid and has an O-ring 14b which cooperates with aperture 12a to provide a fluid tight seal.

5 An elongated, hollow, cylindrical member 16 is provided and is secured to the plate 12 by a metallic ring 18 which is mechanically deformable to cause a tight engagement between member 16 and plate 12. The member 16 is preferably polyethylene or similar material.

10 An elastic member 20 is disposed within the member 16 and is secured at one end to the boss 12b by means of a metallic ring 22 which, like the ring 18, is mechanically deformable to provide a tight seal between the member 20 and the boss 12b. A second end of the elastic member 20 is provided with a plug means 24 insertable within said second end of the elastic member and held therein by means of the metallic ring 26 which is similar to the rings 18 and 22 previously described. The plug 24 is provided with a strap 24a for a purpose to be described.

15 The infusor as shown in FIGURE 2 is in position to receive plasma. To accomplish this the valve 14 is rotated to an open position wherein there is communication between the valve passageway 14a, the plate aperture 12a, and the interior of the elastic member 20. The strap 24a will be grasped and pulled in a direction away from the plate 12 to thereby stretch the member 20 in a balloon fashion. The plasma will then be admitted through the valve 14 and will fill the elastic member 20 causing member 20 to expand radially into the position shown in FIGURES 3 and 4, member 16 serving as a limiting enclosure to insure proper filling of the member 20.

20 When member 20 has been filled with plasma the valve assembly 14 will be moved to its closed position to thus provide an air-tight device capable of holding and storing the plasma. When the plasma within the device is to be used for transfusion or similar purposes the valve 14 is secured to a tube leading from a hypodermic syringe. With the hypodermic administered to the patient the infusor may be positioned along side of the patient and at the same height as the patient. Valve 14 is then moved to its open position thus allowing the flow of plasma therethrough. The contractive force of the elastic member 20 is sufficient to move the plasma into the patient without the necessity of elevating the plasma to provide potential energy. When member 20 has fully contracted the plasma will have been delivered to the patient and the valve 14 will then be closed and a transfusion will be completed.

25 The metallic rings 18, 22 and 26 provide the firmness of connection which is essential due to the high forces which are developed within the device when the device is filled with plasma. The rings are applied with a crimping operation to provide both a firm mechanical connection and a fluid tight seal.

30 Changes in construction will occur to those skilled in the art and various apparently different modifications and embodiments may be made without departing from the scope of the invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only. The actual scope of the invention is intended to be defined in the following claims when viewed in their proper perspective against the prior art.

35 What is claimed is:

1. A device for storing and infusing blood plasma or similar fluid, said device comprising plate means, a boss extending from said plate means, an aperture extending through said plate means and said boss, valve means disposed in said aperture for controlling the flow of liquid therethrough, an annular flange disposed around the outer periphery of said plate means, an elongated cylindrical

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member having an end overlying said annular flange, mechanically deformable means surrounding said end for securing said cylindrical member to said annular flange, an elastic inflatable member disposed within said cylindrical member, said elastic member having a first end overlying said boss, mechanically deformable means surrounding said first end for securing said elastic member to said plate means with the interior of said elastic member being in communication with said valve means, said elastic member being capable of radial expansion within limits defined by said cylindrical member upon the introduction of fluid through said valve means into said elastic member, plug means disposed within a second end of said elastic member, mechanically deformable means surrounding said second end for securing said plug means to said elastic member, and means extending from said plug means

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for facilitating axial elongation of said elastic member, said cylindrical member having an open end for permitting said axial elongation.

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