

May 24, 1960

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2,937,643

DEVICE FOR FLUID TRANSFERENCE

Filed Oct. 11, 1957

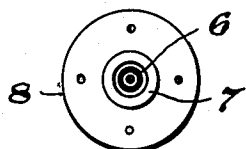


FIG. 2.

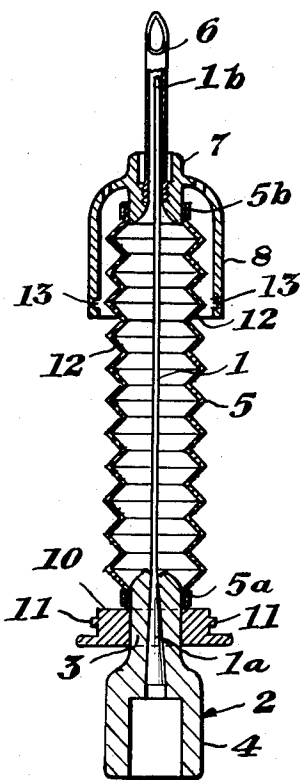


FIG. 1.

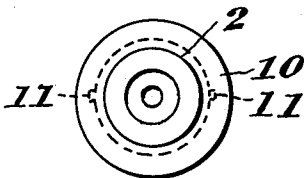


FIG. 3.

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DEVICE FOR FLUID TRANSFERENCE

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Filed Oct. 11, 1957, Ser. No. 689,590

7 Claims. (Cl. 128-214)

The present invention relates to a device for fluid transference and more particularly to a catheter for intravenous injection and transfusion.

There are, at present, a number of devices in use for transferring fluids intravenously to a patient through a needle introduced into a vein. In these prior devices, there is no way of introducing a short plastic catheter into the vein without going through the detailed operation of threading a catheter through a needle, withdrawing the needle over and off the catheter and then connecting the catheter to another needle and then to a plastic tubing.

The present invention overcomes these disadvantages by providing a needle with a catheter therein, the catheter being adapted to be projected, with the needle, into the vein. The needle is then withdrawn leaving the catheter positioned in the vein. An added advantage of the present invention is the fact that it enables the catheter to be kept in a sterilized condition before use.

The invention comprises a device having a hollow needle, a catheter slidable in the needle, and an axially extensible and collapsible tubular member surrounding the catheter and having one end fixed with respect to the catheter remote from the free end thereof, said hollow needle being associated with the free end of the tubular member, the catheter being adapted to terminate within the needle when the tubular member is extended and to project from the needle when the tubular member is collapsed.

The invention will now be described with reference to the accompanying diagram in which:

Figure 1 is an elevation, partly in cross-section, of the device,

Figure 2 is an end view of that part of the device carrying the needle; and

Figure 3 is an end view of that part of the device carrying the means for attachment to a fluid reservoir.

In the embodiment showing the diagram, the device comprises a flexible catheter 1 which may be of plastic or any other suitable material. One end 1a of the catheter has means 2 affixed to it for attachment to a fluid reservoir. Means 2 may consist of a tubular neck 3 having an enlarged portion 4 to which a tube (not shown) leading from a reservoir may be attached.

A tubular member 5, preferably a bellows, surrounds catheter 1 and is fixed at one end 5a to the neck 3 of means 2. In its extended position, bellows 5 does not extend as far as free end 1b of catheter 1. Bellows 5 carries perforations 12 allowing air to escape when the bellows is collapsed.

Fixed to free end 5b of bellows 5 is a thin walled hollow needle 6. As indicated in the drawing, needle 6 may be removably fixed to free end 5b of bellows 5 by means of an adapter 7 to which the needle may be threaded or otherwise attached. Free end 1b of catheter 1 terminates in needle 6 when bellows 5 is fully extended. When bellows 5 is collapsed, catheter 1 projects substantially from the open end of needle 6.

To enable bellows 5 to be secured in the collapsed position, a cup-like housing 8 is attached to adapter 7 and extends back over part of the bellows. A disc 10 having projection 11 is rotatably mounted on neck 3 of means 2. Slots 13 in housing 8 are positioned to be engaged by projection 11 when bellows 5 is collapsed. The housing 8 is thus detachably secured to means 4, the

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bellows being retained in a relatively dust proof container.

In the operation of the device, the assembly is supplied in sterile condition with catheter 1 positioned inside both bellows 5 and the needle 6. Needle 6 is inserted in the vein and as soon as blood wells up in the needle, catheter 1 is pushed forward to enter the vein by moving disc 10 towards housing 8. Depending upon the length of catheter used, it can be seen that a substantial portion may enter the vein. As catheter 1 is pushed forward and bellows 5 is collapsed the air trapped inside the bellows escapes through perforations 12 rather than entering the vein. The blood in the needle, acting as a seal, further ensures that the air in the bellows will not enter the vein but will escape by means of the perforations. When catheter 1 has been pushed forward as far as possible bellows 5, now in collapsed position, is retained within cup-like housing 8 by the action of the projections on disc 11 engaging slots 13 in the housing. The needle is then withdrawn from the vein, drawing out a short portion of the catheter but leaving a substantial length of it in the vein.

Alternatively, of course, the device may be operated by drawing housing 8 back towards disc 10 to withdraw needle 6 from the vein, thus leaving a greater length of catheter 1 in the vein.

In an alternative embodiment of the invention, bellows 6 may be replaced by a flexible member, tubular in cross-section and helically formed so as to be extensible. The operation of this embodiment is the same as previously described.

What I claim as my invention is:

1. A device for transferring fluids comprising a hollow needle, a catheter slidable in the needle, an axially extensible and collapsible tubular member surrounding the catheter and having one end fixed with respect to the catheter remote from the free end thereof, said needle being associated with the free end of the tubular member, the catheter being adapted to terminate within the needle when the tubular member is extended and to project from the needle when the tubular member is collapsed.

2. A device for transferring fluids as in claim 1, including a latching means associated with the ends of the tubular member to detachably secure the said tubular member in collapsed position.

3. A device for transferring fluids as in claim 1, wherein the tubular member is perforated bellows.

4. A device for transferring fluids as claimed in claim 2, wherein the latching means includes projections associated with one end of the tubular member which are adapted to be detachably secured in slots carried by means associated with the opposite end of the tubular member.

5. A device for transferring fluids as in claim 4, wherein said means associated with the opposite end of the tubular member comprises a cup-like housing extending back over part of the tubular member, said housing carrying slots in which said projections of the latching means are detachably secured when the tubular member is in collapsed position.

6. A device for transferring fluids as claimed in claim 1, wherein the needle is detachably secured to the tubular member.

7. A device for transferring fluids as in claim 1 including means associated with the catheter for connection with a reservoir.

References Cited in the file of this patent

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