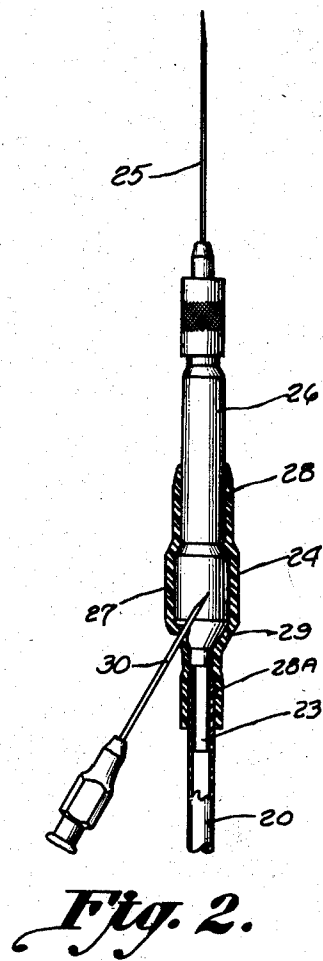
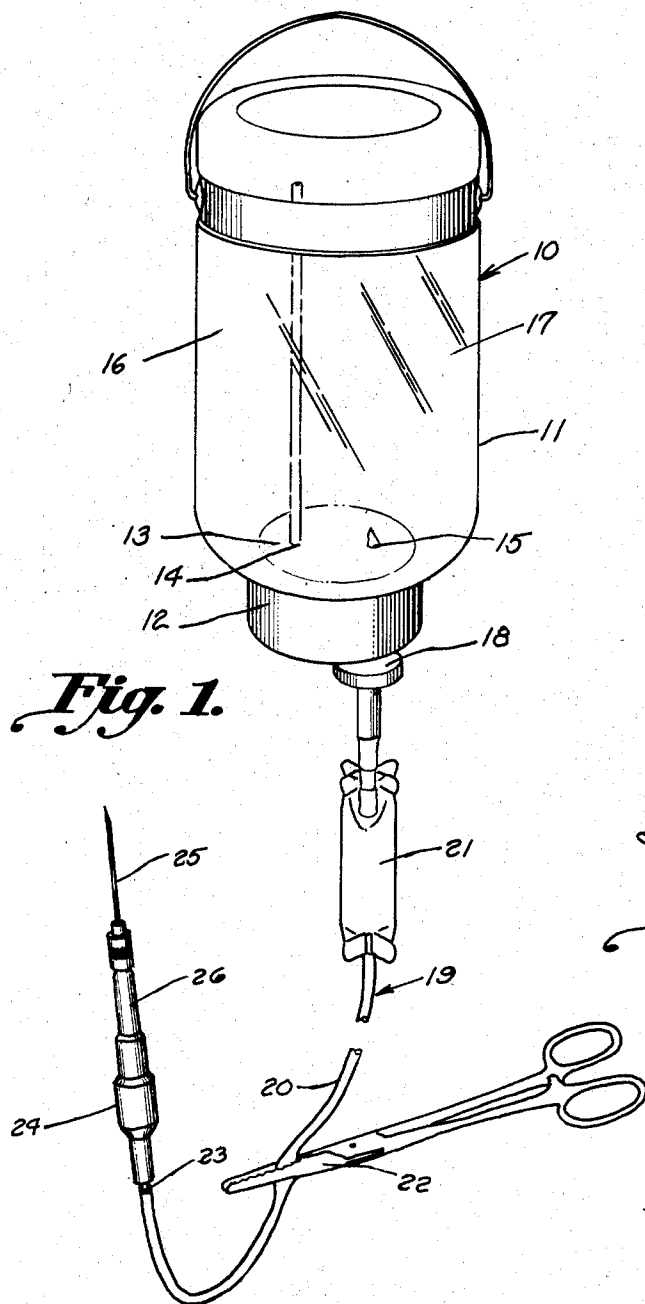


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FLASH-BACK INDICATOR

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FLASH-BACK INDICATOR

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This invention relates to a flexible tubular portion of a parenteral administration set and, more particularly, to a flash-back indicator.

In the administration of parenteral fluids, it is customary to ascertain whether or not the hypodermic needle through which the fluid enters the body has punctured a vein. This is important in many instances because the therapy to be achieved by the parenteral fluid can be brought about best by either subcutaneous or intravenous injection. Further, subcutaneous injection of a fluid designed to be injected intravenously may be very painful to the recipient.

The most commonly practiced method for ascertaining whether a vein has been punctured has consisted of squeezing a portion of the flexible conduit of the parenteral administration set and visually noticing, after the flexible tubing has regained its former shape, whether blood has been drawn into the flexible tubing portion. It is to this end that my invention is directed.

The essential elements of a parenteral administration apparatus usually include a container source of the parenteral fluid and an administration set leading from this source to the body of the recipient. The administration set includes a length of flexible tubing, which is provided at one end with a connector suitable for connecting the flexible tubing to the source of parenteral fluid and provided at the other end with a hypodermic needle suitable for insertion into the body of the recipient. At a point between the flexible tubing and the hypodermic needle a short length of rubber tubing is inserted which is useful in determining whether a vein has been punctured.

The need for inserting the above-mentioned rubber tubing was brought about by the use for about the last eight years or so of plastic materials for the main portion of the flexible conduit, which plastic tubing was found to be substantially inferior to rubber in bringing about a "flash-back" of blood by squeezing. In addition, it is often desirable to administer other medication at the same time as the parenteral administration is progressing. To minimize patient discomfort, physicians have followed the practice of inserting into the flexible tubing a needle of a hypodermic syringe containing the additional medication. Thus, there is no need for a second patient puncture. However, the plastic portion of the set has proved inadequate for this purpose since it generally does not possess sufficient elasticity to reseal itself upon removal of the supplemental medication needle.

Despite meeting the requirements of being self sealing and also flexible enough to provide a flash-back indication, the above-mentioned length of rubber tubing is subject to two distinct disadvantages. Since it is of a relatively small diameter, the aspirating effect achieved by squeezing it is minimal, so it is often difficult to cause blood to flash back into the administration set. Secondly, it is a delicate operation to insert in it the needle of a separate hypodermic syringe containing additional medication.

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The flash-back indicator of my invention overcomes these two drawbacks by providing in place of the aforementioned rubber tubing a flexible tubular member having a wider portion intermediate the ends thereof.

It is therefore an object of this invention to provide a new and superior flash-back indicator for a parenteral administration set. Another object is to provide a flash-back indicator which possesses superior blood aspirating characteristics. Still another object is to provide a flash-back indicator which expedites the administration of supplemental medication. Other objects and advantages of my invention will be seen as the specification proceeds.

My invention will be explained in connection with the accompanying drawing, in which Fig. 1 is a perspective view of a parenteral administration apparatus and Fig. 2 is an enlarged elevational view partially in section of the flash-back indicator portion of the parenteral administration apparatus set forth in Fig. 1.

Referring to the drawing and in particular Fig. 1, a perspective view of a parenteral administration apparatus is shown. Inasmuch as my invention is directed to a specific portion of this apparatus, the remaining portions are shown generally, and no claim is made to their specific structure. The apparatus includes a source of parenteral fluid designated 10, which in the usual embodiment is a glass bottle 11 suspended in a mouth-downward condition. The downwardly extending mouth 12 of bottle 11 is closed by stopper 13, which is provided with a pair of passages 14 and 15 extending therethrough. Passage 14 permits the entrance of air into bottle 11 through air-tube 16 to replace parenteral fluid 17 flowing out through liquid outlet passage 15.

Inserted into liquid outlet passage 15 is connector 18 of a parenteral administration set generally designated 19. Parenteral administration set 19 in addition to connector 18 includes a length of flexible tubing 20, generally constructed of a plastic material, which is attached at one end to connector 18. As shown in Fig. 1, a drip housing 21 may be inserted in the length of flexible tubing 20 so as to provide a visual means for determining the rate of flow of parenteral fluid 17. Clamping means are usually provided with a parenteral administration set and may take the form of hemostat 22, shown clamped on tubing 20.

The end of flexible tubing 20 opposite from that attached to connector 18 is provided with stiffener 23 inserted therein. Mounted on the portion of stiffener 23 external to tubing 20 is flash-back indicator generally designated 24. Flash-back indicator 24 at its opposite end is connected to hypodermic needle 25, which has been previously provided with shank portion 26, on which flash-back indicator 24 has been mounted.

Flash-back indicator 24 can be seen more clearly by reference to Fig. 2. In the preferred embodiment, flash-back indicator 24 is generally tubular in construction and is provided with an integral, intermediate wider portion 27 and constricted end portions 28. Thus, an annular sloping shoulder portion 29 is provided at the point where the wider portion 27 of indicator 24 tapers inwardly to join constricted portion 28.

I have found the sloping shoulder portion 29 to be the most desirable location at which to administer supplemental medication. In clinical tests it has been noted that the attending physician or nurse generally chooses this shoulder portion for inserting the needle of the hypodermic syringe containing the supplemental medication because it apparently lessens the chance of puncture of the opposite wall and introduces the supplemental medication with a minimum of turbulence. This can be noted from the angle of needle 30 in Fig. 2.

With respect to sloping shoulder portion 29 I have found this form of shoulder to be more desirable than a

shoulder which is in perpendicular relation to the axis of flash-back indicator 24, since a lesser thickness of wall can be utilized in the sloping shoulder, yet preserve the self-sealing characteristic.

The preferred embodiment of my invention has constricted portions at both ends of indicator 24. As can be seen from Fig. 2, the end 28 of indicator 24 mounted on needle shank 26 is of considerably larger size than the opposite end 28a mounted on tubing stiffener 23. An obvious modification is to dispense with constricted end 28 altogether by providing an adapter of larger outside dimensions for needle shank 26.

I have found superior results to be achieved by using rubber as the material of construction for indicator 24. The preferred method for producing indicator 24 is by molding, although the same can be achieved by dipping a form constructed according to the inner dimensions of indicator 24.

I do not limit the indicator of my invention to any specific material of construction nor to any specific method of forming the same, inasmuch as other materials and methods of forming will be obvious to those skilled in the art.

This is especially significant when there is no need to provide for the administration of supplemental medication. In that event, there is no need for the flash-back indicator to be constructed of a material adapted to reseal itself after being punctured by a hypodermic needle. In such an instance, a plastic material may be used and the same formed by extruding, followed by expanding, an intermediate portion of the same. Thus, the superior aspirating characteristic of the flash-back indicator is provided. Still another method useful in forming the indicator of my invention when the same is constructed of a thermoplastic material is to utilize the structure set forth in the commonly owned patent, George R. Bent, No. 2,702,036, issued February 15, 1955, entitled "Drip Tube," wherein a plurality of sector portions are brought together and fused to form constricted end portions.

Operation

When the parenteral apparatus shown in Fig. 1 has been interconnected as indicated and hypodermic needle 25 inserted into the vein of a patient (not shown) who is to be the recipient of parenteral fluid 17, the attendant manually squeezes indicator 24; and upon release of such manual pressure, blood will be aspirated up through hypodermic needle 25 into indicator 24 if a vein has been punctured by needle 25. Thus, a clear-cut indication of the nature of the puncture is provided.

Indicator 24 lends itself particularly to expeditious administration of supplemental medication, as by the puncture of wider portion 27 by hypodermic needle 30, shown in fragmentary form. After the desired supplemental medication, which may be a barbiturate or any other parenteral fluid desired, hypodermic needle 30 may be removed from wider portion 27, whereupon the flexible material of which indicator 24 is constructed will reseal itself, preventing contamination of the recipient by foreign material from the atmosphere.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations are to be inferred therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. A flash-back indicator for a parenteral administration set, comprising a flexible tubular member having a finger-squeezable intermediate chamber portion of greater cross-sectional area than that of the end portions of the said tubular member, said flexible tubular member being constructed of a material adapted to reseal itself upon puncture by a hypodermic needle whereby the administration of supplemental medication is expedited.

2. A flash-back indicator of the character set forth in claim 1 wherein the material of construction is rubber.

3. A tubular member adapted to be inter-connected in a parenteral administration set between the hypodermic needle means and the flexible tubing means thereof, said member being constructed of rubber of a thickness sufficient to be self-sealing after puncture by a hypodermic needle, said member comprising a constricted tubular portion of approximately the same diameter as the said flexible tubing means and a finger-squeezable enlarged cross-sectional area portion connected to said constricted portion by an integral sloping shoulder.

4. A member of the character set forth in claim 3, wherein a second constricted tubular portion is secured to said enlarged portion in axial relation thereto by an integral shoulder portion.

5. In a tube and needle administration set including a length of flexible tubing having bottle connection means at one end and recipient needle means at the other end, the improvement comprising a flexible tubular member inter-connected between said tubing and said needle, said tubular member being constructed of a material capable of resealing itself after hypodermic needle puncture and having an enlarged chamber portion spaced from the end thereof connected to said tubing, whereby squeezing and releasing said chamber portion causes blood to be aspirated into said chamber when said recipient needle means has penetrated the vein of an intended recipient.

6. A parenteral administration set comprising a length of flexible tubing connected at one end thereof with a bottle source of parenteral fluid, means stiffening the other end of said tubing, a flexible tubular member mounted on the stiffened portion of said tubing, said tubular member being so constructed as to reseal itself after puncture by a hypodermic needle and having a diameter on its end mounted on said tubing approximately the size of said tubing, a portion of said tubular member spaced from the mounted portion thereof being of substantially larger diameter than the mounted portion, and a hypodermic needle assembly mounted in the end of said tubular member remote from the tubing-mounted end.

References Cited in the file of this patent

UNITED STATES PATENTS

1,511,827	Comer	Oct. 14, 1924
2,481,488	Auzin	Sept. 13, 1949
2,656,835	Eisenstein	Oct. 27, 1953
2,664,085	Ryan	Dec. 29, 1953
2,681,654	Ryan et al.	June 22, 1954

FOREIGN PATENTS

13,585	Great Britain	July 15, 1895
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