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G. BARRADAS ET AL
PLASTIC INJECTION DEVICE

2,668,534

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FIG. 1.

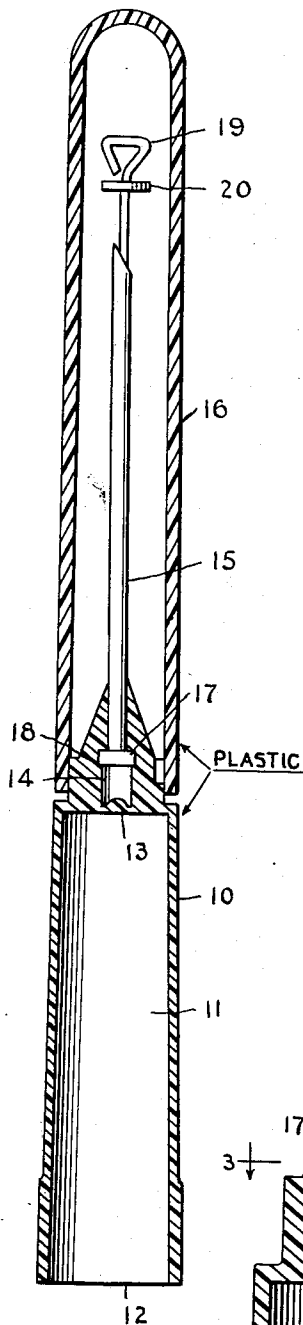


FIG. 2.

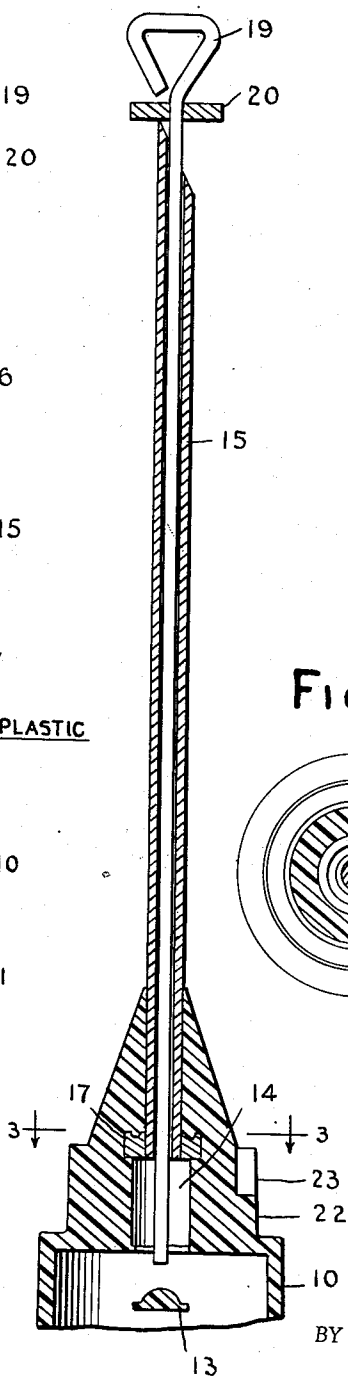


FIG. 4.

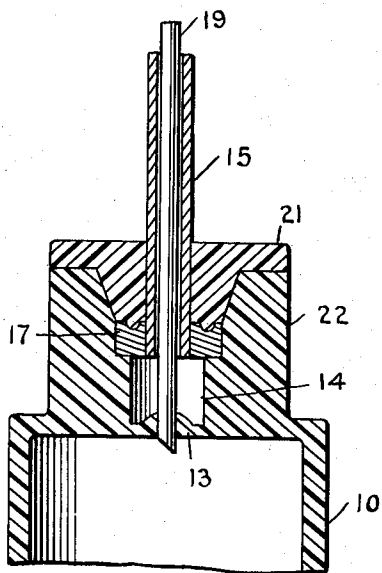
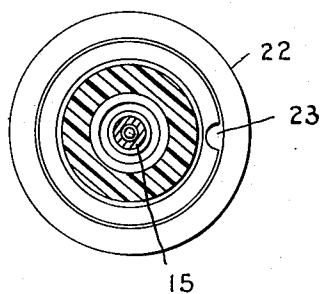


FIG. 3.



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PLASTIC INJECTION DEVICE

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2 Claims. (Cl. 128—216)

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This invention relates to improvements in hypodermic syringe units and relates particularly to hypodermic syringes that are adapted to be furnished in a sterile condition containing medication in one unit, with the needle assembled therein. Syringes of this type are well known and are now commonly used by the military medical services where extemporaneous sterilization is an insurmountable problem. Units of this type are made for a single use and are then intended to be discarded.

It is an object of this invention to supply a unit made of transparent plastic to allow the operator to easily determine if the needle is in a blood vessel and if it has been so inserted to remove the needle and reinsert it to avoid the blood vessel.

It is proposed to supply a device where the needle is rigidly assembled so as to prevent the needle from becoming loose and out of alignment on insertion and also to prevent the needle from pulling out of the device when the needle is removed from the patient.

Further objects of this invention will become apparent from the following description, which is given in conjunction with the drawings, wherein:

Figure 1 is a sectional view of one embodiment of the device shown, unfilled for convenience of illustration.

Fig. 2 is an enlarged fragmentary view of the needle and the diaphragm assembly illustrating the action of the stylet.

Fig. 3 is a sectional view on line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary sectional view of the needle base and the top of the body portion of another embodiment of the invention.

The device is shown in Fig. 1, wherein 10 indicates the body portion of the device, said body portion comprising a medication cavity 11, shown unfilled for purposes of illustration, which is sealed at the end 12 after filling. This sealing is accomplished by heat means or by other well known methods. It is sealed at its upper end by means of the integrally formed diaphragm 13, which prevents the medication from flowing into the conduit 14 leading to the needle 15. The upper end of the needle is protected by means of the hood 16. The needle 15 has a boss 17 on its base, which is seated on a shoulder 18 in the conduit 14 and the upper end of the conduit is then swaged around the needle. The diaphragm 13 is made with a thickened section in the center surrounded by a thin section which allows the removal by tearing out of the center section, or by puncturing of the diaphragm. This is shown in

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Fig. 1 and is also shown torn out by means of the stylet 19, in Figure 2. Figure 4 shows a diaphragm punctured by the stylet 19.

The steel stylet 19 is made with a permanent curve to be held in the lumen of the needle by spring action having a handle formed at one end and being greater in length than the needle plus the distance from the base of the needle to the diaphragm. It has its lower end cut at an angle as shown in Figure 4, or it may be cut square as shown in Figure 2. A shield 20, made of laminated paper or similar material, on the upper end of the stylet protects the fingers of the user from injury, and the needle point from contamination when the stylet is pushed in to open the diaphragm 13. An alternative method of assembling the needle and the plastic container is shown in Fig. 4, wherein the needle 15 is assembled with a plastic block 21, which is then aligned with the top of the body container and sealed thereto by means of heat or by other well known methods. The needle and the stylet are protected from accidental damage and maintained in a sterile condition by means of the hood 16 which is force fitted on to the exterior part 22 of the body portion. This part 22 of the body portion which contacts the hood is shown in Fig. 2 and contains a vent 23 for part of its height. This is shown in Fig. 3. This allows the insertion of the hood part way down the base 22, the vent 23 allowing the sterilization material to flow into the hood and around the needle. After sterilization the hood is seated, thereby closing vent 23.

After sterilization, when it is desired to use this device (as shown in Figure 1), the hood is removed (as shown in Figure 2), the stylet forced downwardly until the shield 20 contacts the end of the needle 15 thereby opening the diaphragm 13, either by puncturing the same or by forcing the diaphragm to open along the thin section contained between the two thick sections. The stylet is then removed and discarded. The needle is inserted, the operator visually noting if the blood flows into the chamber 14 or the chamber 11, and if it does, the needle is then removed and reinserted in a new place to avoid the flow of blood into the injection device. When no blood is noted the collapsible body 10 is compressed to force the medicant contained in chamber 11 through the conduit 14 into the needle.

The diaphragm 13 sealing the body portion from the needle is made with a thick center section (as shown in Figure 1). This may be either punctured by the stylet, as shown in Fig. 4, or may be torn from the body section by the stylet,

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as shown in Figure 2, the tear taking place at the thin section between the two thick sections. The diaphragm 13 as formed by the die in making the body part 10 is always larger than the conduit 14 and is deflected either upwardly or downwardly within this conduit. On puncturing it has a tendency to close the hole on the removal of the stylet. This is overcome by forming the diaphragm 13, as shown in Figure 1, where it may be either torn bodily from the wall of the conduit 14, as shown in Figure 2, or may be punctured as shown in Figure 4. With the thickened central section there is no tendency to close the hole so made and the contents of the chamber 11 are allowed to flow into the conduit 14.

While the above embodiments of this invention are given as examples therefor, the invention should not be limited by these examples. Many variations will present themselves to one skilled in the art and fall within the scope of this invention.

What is claimed is:

1. A hypodermic injection device comprising a transparent plastic container, a diaphragm dividing said container into two chambers, one adapted to hold a liquid, said diaphragm having a thin portion between two thick portions, a boss in said container near one end thereof, a needle extending through one end of said container and terminating in said boss, a seat in said container engaging the boss to hold it against the adjacent end of the container, a stiff wire stylet inserted in the lumen of the needle,

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said wire being longer than the needle by an amount greater than the distance from the lower end of the boss of the needle to the diaphragm, the needle when assembled with the wire and the transparent plastic container being covered by a plastic hood, said hood being held in position by frictional contact with the thickened portion of the body.

2. A hypodermic injection device comprising a transparent plastic container, a diaphragm dividing said container into two chambers, a boss in said container near one end thereof, a needle extending through one end of said container and terminating in said boss, a seat in said container engaging the boss against the adjacent end of the container, a stiff wire stylet longer than the needle by a length greater than the distance from the lower end of the boss of the needle to the diaphragm, said diaphragm having a thickened central section.

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