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A. GINSBURG

2,899,960

HYPODERMIC NEEDLE

Filed March 13, 1958

Fig. 1

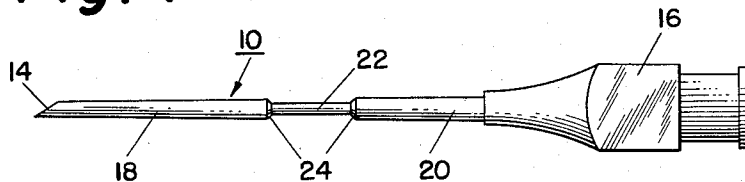


Fig. 2

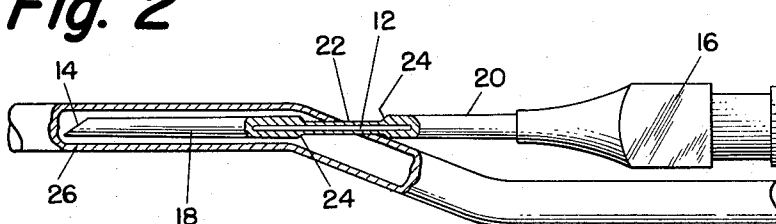
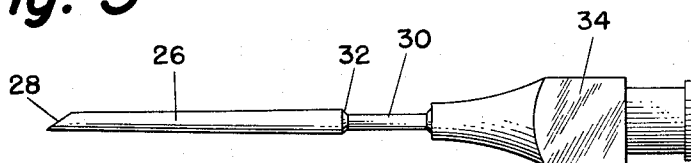


Fig. 3



INVENTOR.
ABRAHAM GINSBURG

BY
Caesar and Rivise
ATTORNEYS

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HYPODERMIC NEEDLE

Abraham Ginsburg, Philadelphia, Pa.

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1 Claim. (Cl. 128—221)

The instant application relates to a hypodermic needle and is a continuation-in-part of my copending applications Serial No. 691,627, filed October 22, 1957, now Patent No. 2,850,014, and Serial No. 714,149, filed February 10, 1958.

The conventional hypodermic needle with a straight shank which is smooth throughout its length has a number of disadvantages. Before it attains its proper position in the vein, the insertion point frequently scratches the vein wall causing pain. At its insertion locus the vein engages a portion of the shank of the needle which is smooth and of the same outer diameter as the remainder of the shank. Because of this, limb movement will not only cause the shank to rock around the insertion locus, but will also cause the needle to slip out. Moreover, because the shank of the conventional needle is smooth and of substantially uniform outer diameter throughout its length, it is not always possible to insert the needle intravenously to the proper final position either for injection or for withdrawal of blood. It has been found that approximately 36% of all intravenous injections require reinsertion of the conventional hypodermic needle.

The primary object of the invention is to provide a hypodermic needle with a self-locking means intermediate its ends to receive the vein wall and automatically retain the needle in proper position on initial insertion.

Another object of the invention is to provide a hypodermic needle with a self-locking means which is strong, durable, easy to clean with a stylus and inexpensive to manufacture.

These and other objects of the invention will become more apparent as the following description proceeds in conjunction with the accompanying drawing, wherein:

Figure 1 is an elevational view of the needle;

Figure 2 is an elevational view of the needle shown inserted in a vein, parts being broken away to show internal construction; and

Figure 3 is an elevational view of a modified form of the needle.

Specific reference is now made to the drawing wherein like reference numerals are used for like parts throughout.

The hypodermic needle comprises a shank 10 with a bore 12 therethrough of uniform diameter throughout, one end of which shank has an insertion point 14 and the other end of which carries an adapter 16 for attachment to a syringe, a tube connected to a suspended container having an injectable fluid therein and so forth, all as is well known in the art of intravenous injection. While the outer diameter of the shank up to the insertion point may be of uniform size, it is preferred that the shank taper slightly from the adapter to the insertion point.

The shank 10 is divided into an anterior portion 18 and a posterior portion 20. The portion 22 between the anterior and posterior portions is formed by reducing the

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outer diameter of the shank, as will be evident from the drawing, without reducing the diameter of the bore 12. The ends of the reduced or constricted portion 22 form shoulders 24 with the anterior and posterior portions 18 and 20 of the shank, said shoulders being preferably tapered. It is preferred that the shoulder terminating the anterior portion 18 be spaced approximately $\frac{3}{4}$ to 1 inch from the insertion point 14.

In use, the needle is inserted in the vein 26 at an approximate 45° angle. As the needle is being inserted, the posterior portion 20 of the shank which is attached to the adapter is depressed and because the vein is elastic it will bend as shown in Figure 2 so that the axis of the needle is substantially in alignment with the axis of that portion of the vein in which the anterior shank portion 18 is located. Insertion of the needle is continued until the vein wall snaps into the constricted portion 22 stopping further forward movement of the needle. The constricted portion 22 of the shank serves to anchor the needle into the vein and thus prevent to and fro movement of the needle which usually causes dislodgment thereof.

In Figure 3 is shown a modification of the needle. It comprises a shank 26 of smooth exterior whose outer diameter for the major portion of its length is either uniform or tapers slightly towards the insertion point 28. At its posterior end the outer diameter of the shank is reduced or constricted as at 30 in the same manner as the constriction 22 is produced whereby the internal diameter of the bore throughout the length of the shank remains uniform and unconstricted. The reduced or constricted portion 30 forms a shoulder 32, preferably tapered, in the shank and the other end of the constricted portion 30 is connected to the adapter 34. The length of the shank 26 from the insertion point 28 to the shoulder 32 is preferably that of the length of the anterior portion 18 of the shank shown in Figures 1 and 2.

The manner of inserting the needle of Figure 3 into the vein until the vein wall locks into the constricted portion 30 is substantially the same as that described in connection with the needle of Figures 1 and 2.

Both modifications of the needle may be made simply and inexpensively by grinding the shank of a conventional hypodermic, or a conventional hypodermic with a somewhat enlarged outer diameter, at a predetermined location with a wheel whose periphery is of the desired width and shape to produce the constriction 22 or the constriction 30.

While preferred embodiments of the invention have been shown and described herein, a skilled artisan may make minor variations without departing from the spirit of the invention and the scope of the appended claim.

I claim:

A hypodermic needle having an elongated hollow shank terminating in an insertion point and means on said shank to lockingly receive the wall of a vein after needle insertion, said means comprising a constricted portion spaced from said insertion point formed by reducing the outer diameter of said shank at a predetermined location, the ends of said constricted portion forming shoulders with said shank serving to limit to and fro movement of the needle in the vein.

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