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2,899,959

HYPODERMIC NEEDLE

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Fig. 1

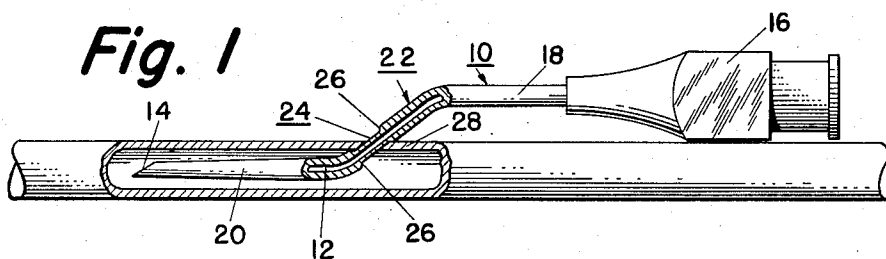


Fig. 2

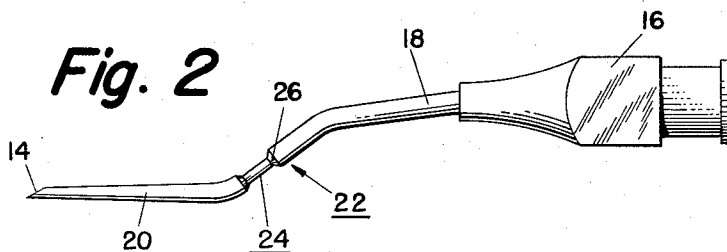


Fig. 3

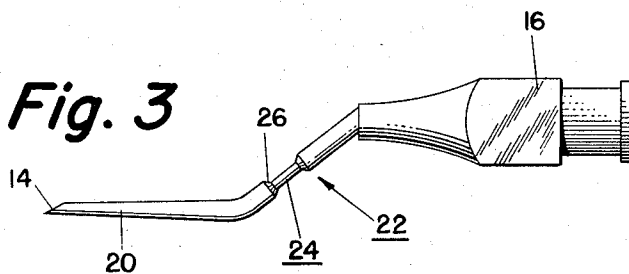
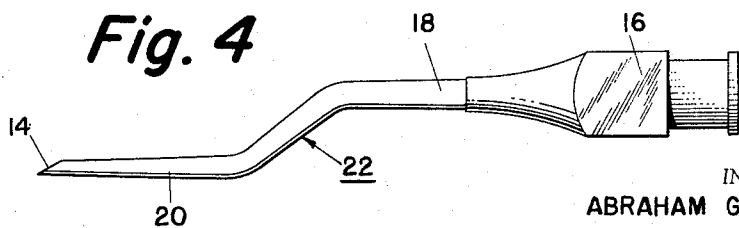


Fig. 4



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HYPODERMIC NEEDLE

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3 Claims. (Cl. 128—221)

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

The conventional hypodermic needle with a straight shank has a number of disadvantages. Before it attains its proper position for injection, the insertion point frequently scratches the vein wall causing pain. Pain also results from limb movement which causes the shank to rock around its insertion locus. Excessive limb movement also causes the needle to slip out. Because the shank is straight, 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 percent of all intravenous injections require reinsertion of the hypodermic needle.

The primary object of the invention is to provide a hypodermic needle which overcomes the aforementioned disadvantages of the conventional hypodermic. This is accomplished by providing a hypodermic whose shank comprises two vertically spaced, horizontally extending portions joined by an off-set medial portion which extends at an angle obtuse to the axis of each horizontal portion.

A further object of the invention is to provide a hypodermic needle of the character described in which the off-set medial portion is provided with a means to lockingly receive the vein wall whereby the needle is automatically retained in proper position on initial insertion.

Another objection of the invention is to provide a hypodermic needle with a self-locking feature 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 shown inserted in a vein, parts being broken away to show internal construction;

Figure 2 is an elevational view of one modified form of the needle;

Figure 3 is an elevational view of a second modified form of the needle; and

Figure 4 is an elevational view of a third modified form of the needle.

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

Referring first to Figure 1, 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 injectible fluid therein and so forth, all as is well known in the art of intravenous injection. The shank is medially off-set so that it includes an upper horizontally extending portion 18 and a lower horizontally extending portion 20 joined by an intermediate portion 22.

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In this form of the invention the upper and lower shank portions 18 and 20 are substantially parallel to each other and the axis of the adapter 16 is aligned with that of the upper portion 18. The axis of the intermediate portion 22 extends at an obtuse angle to the axis of the upper portion 18 and at an obtuse angle to the axis of the lower portion 20, the angle being preferably 135°.

The intermediate portion 22 joins the upper and lower portions at preferably rounded corners and between these corners, a portion of the outer diameter of the intermediate portion 22 is reduced or constricted as at 24. It is preferred that the shoulders 26 at the ends of the constriction 24 be tapered.

In use when the needle is inserted in the vein and moved until the vein wall 28 snaps into the constriction 24, the proper position of the needle is automatically attained with the lower shank portion 20 extending in the vein in substantial parallelism with the vein axis and the adapter 16 on the outside also extends generally parallel to the vein axis. This position can be easily attained without causing the insertion point 14 to scrape or even touch the vein wall opposite the point of insertion. Because the constriction serves as a locking means, pivotal as well as axial movement of the needle relative to the vein is restricted. Since the constriction 24 does not narrow the internal bore 12, there is no resistance to flow of fluid through the needle.

The needle may be made simply and inexpensively by taking a needle having an outer diameter somewhat larger than that of a conventional hypodermic and grinding the shank thereof at a predetermined location with a wheel whose periphery is of a desired width and shape. The grinding produces the constriction 24. The lower portion 20 may also be tapered towards the insertion point. The needle is then bent into the shape shown in the drawing with the constriction 24 being located in the intermediate portion 22.

The fact that the axis of the intermediate portion 22 extends at an obtuse angle to the axes of the upper and lower portions provides a needle construction which can be readily and easily cleaned by the insertion of a conventional flexible metallic stylus through the bore 12. The corners joining the intermediate portion to the upper and lower shank portions do not obstruct passage of the stylus.

The modification shown in Figure 2 is the same as that shown in Figure 1 except that the axis of the upper shank portion 18 is not parallel to the axis of the lower shank portion 20, but rather at a slight upward angle thereto. The adapter 16, however, is connected to the upper shank portion 18 at an angle so that the axis of the adapter is substantially parallel to the axis of the lower shank portion 20. Thus when the needle is inserted in the vein and automatically locked therein, the adapter 16 assumes its proper position. As in the case of the needle of Figure 1, the axis of the intermediate portion 22 of Figure 2 extends at an obtuse angle to the axes of the lower shank portion 20 and the upper shank portion 18.

The modification of Figure 3 varies from that of Figure 1 only in that the adaptor 16 is directly connected to the intermediate portion 22. The axis of the adapter is substantially parallel to that of the lower portion 20 and, as with the modification of Figure 1, the axis of the intermediate portion 22 extends at an angle obtuse to the axes of the lower portion and the adapter.

The modification of Figure 4 is similar to that of Figure 1 except that the intermediate portion 22 is not equipped with a vein locking means and the needle is continuously tapered towards the insertion point so that the needle is reinforced against breakage particularly at the corners where the intermediate portion joins the

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upper and lower portions. This needle is especially suited for withdrawing blood from children.

While preferred embodiments of the invention have been shown and described herein, it will be understood that skilled artisans may make minor variations without departing from the spirit of the invention and the scope of the appended claims. It will be further understood that the term "shank" as used in the claims includes the adapter.

I claim:

1. A hypodermic needle having a hollow shank terminating in an insertion point, said shank being medially bent to form two vertically spaced horizontally extending substantially parallel portions joined by an intermediate portion whose axis extends at an obtuse angle to each of the axes of said vertically spaced portions, and means

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on said intermediate portion to lockingly receive the wall of a vein.

2. The needle of claim 1 wherein said means includes a constriction in the outer surface of said intermediate portion.

3. A hypodermic needle having a hollow shank terminating in an insertion point, said shank having two vertically spaced horizontally extending portions joined by an intermediate portion whose axis extends at an angle obtuse to each of the axes of said vertically spaced portions and means on said intermediate portion to lockingly receive the wall of a vein after needle insertion.

References Cited in the file of this patent

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