

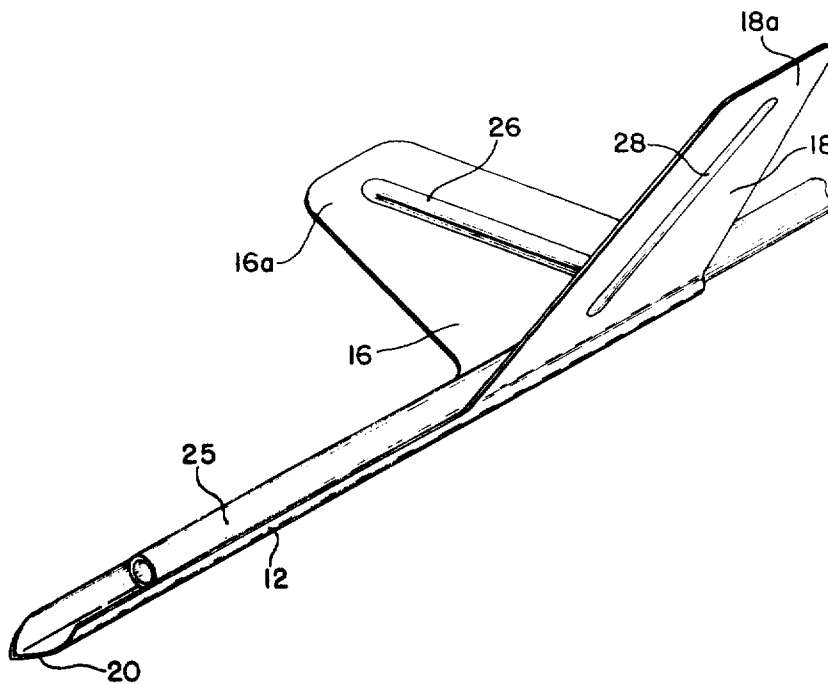
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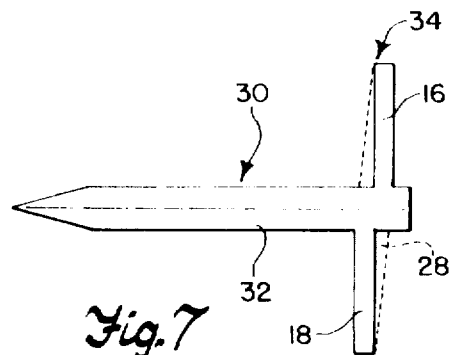
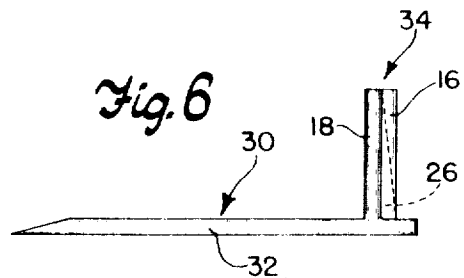
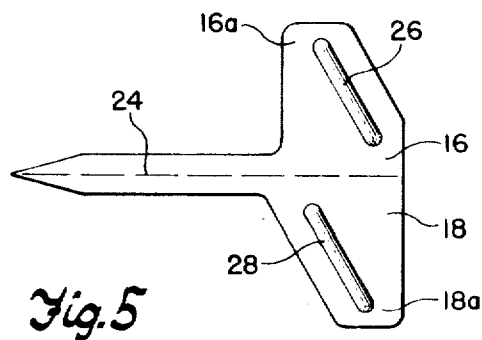
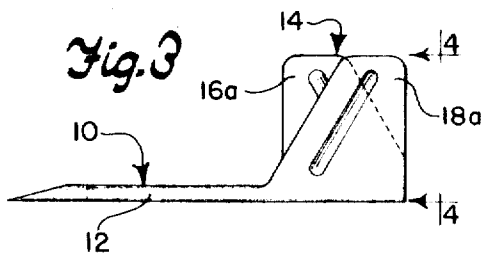
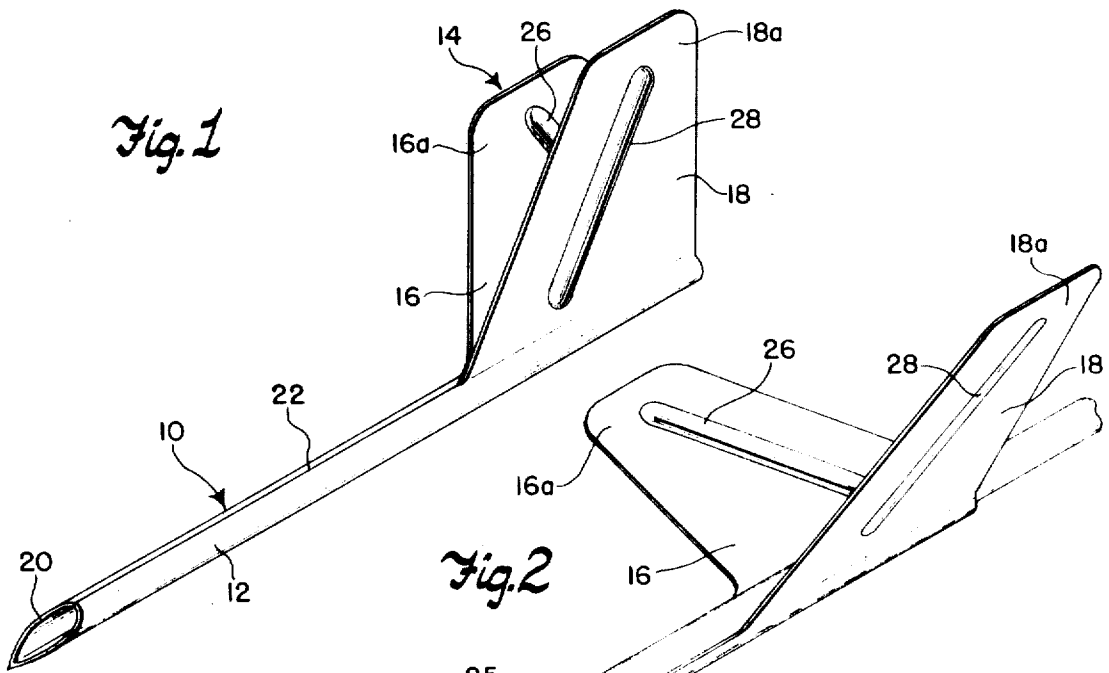
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[54] **REMOVABLE GUIDE NEEDLE**  
 5 Claims, 7 Drawing Figs.  
 [52] U.S. Cl. .... 128/214.4,  
 128/221  
 [51] Int. Cl. .... A61m 5/00  
 [50] Field of Search ..... 128/214,  
 214.4, 221, 347, DIG. 16; 206/56 AA

**ABSTRACT:** A removable guide needle is provided for use with a flexible catheter tube in withdrawing or introducing fluids relative to a body, the guide needle having handle means associated therewith which provides controlled insertion and removal from the body with subsequent detachment from the flexible catheter tube in an expeditious manner.





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### REMOVABLE GUIDE NEEDLE

Current surgical techniques, in making blood transfusions or where intravenous feeding is involved, have utilized various types of hypodermic needles which are connected to flexible catheter tubes designed to carry fluids to or from the body. After the venipuncture has been made by the needle, the catheter is then ready for insertion into the patient for the purpose of withdrawing or introducing fluids relative to the body, as may be desired. In most instances where this type of surgical apparatus has been used, the needle has been retained on the catheter tube; however, this not only creates potential hazards to the patient, but also, as is more likely, much discomfort is experienced by the patient. Various makeshift approaches which have been tried in an attempt to avoid injury or discomfort to the patient have included taping of the needle to the arm or other member of the patient, shielding the needle in one fashion or another, or contriving various expedients as may be thought necessary by the nurse or doctor involved. It will be apparent that the difficulties inherent in various individual expedients at the time of using the needle-retained surgical apparatus have created nonuniform and undesirable surgical procedures.

The present invention is directed to those types of surgical apparatus where a removable guide needle is provided for use with a flexible catheter tube, such that the needle may be laterally removed and detached from the catheter after making the venipuncture. Specifically, the present invention is an improvement over the removable guide needle construction shown in U.S. Pat. No. 3,359,978 in that it facilitates removal or detachment of the needle from the catheter.

One object of the present invention is to provide an improved, removable guide needle construction for use with a flexible catheter tube wherein the guide needle may be laterally removed and detached from the catheter without difficulty.

Another object of the present invention is the provision of a guide needle of the aforementioned type which provides controlled insertion into a vein or other passageway of the body while also permitting quick and easy detachment from the catheter tube.

Other objects of the present invention include the provision of a removable guide needle of the type described above which is simple in construction, compactly configured, adapted for economical and mass manufacturing techniques, provides greater versatility in use, allows longer periods of installation, affords greater comfort to the patient, obviates hazards to the patient, and is otherwise well adapted for the purposes intended.

These and other objects and advantages of the present invention are attained by the provision of a removable guide needle which is designed for use with a flexible catheter in withdrawing or introducing fluids relative to a body, the needle comprising a one-piece, elongated, hollow element into which the catheter is inserted, the hollow element having a longitudinal separation along the length thereof and being formed to permit opening of the hollow element along its longitudinal separation, one end of the hollow element being configured for introduction into a vein or other passageway of a body and the other end of the hollow element having handle means, the handle means including a pair of integral wing sections which are located on opposite sides of the longitudinal separation and being initially juxtaposed relative to one another, corresponding portions of each wing section overlapping one another and the remaining portions of the wing sections being longitudinally offset from one another by an amount sufficient to permit separation thereof and consequent opening of the hollow element along the longitudinal separation for lateral removal and detachment from the catheter.

Reference is now made to the drawing wherein:

FIG. 1 is an enlarged perspective view of a removable guide needle which is constructed in accordance with the teachings of the present invention;

FIG. 2 is also an enlarged perspective view of the guide needle of the present invention, but showing the manner in which the needle is separated for lateral removal and detachment from a flexible catheter;

FIG. 3 is a side elevational view, on a reduced scale, of the guide needle shown in FIG. 1;

FIG. 4 is an end elevational view of the guide needle depicted in FIG. 3 and on the same scale;

FIG. 5 is a top plan view of the guide needle blank which is initially formed in the guide needle manufacture;

FIG. 6 is a side elevational view illustrating two forms of modified guide needle constructions, one of the modifications being shown partially in dotted lines; and

FIG. 7 is a top plan view of the blank forming the two modified forms of guide needle constructions shown in FIG. 6, one feature of one of the modified views being shown in dotted lines as in FIG. 6.

Referring first to the embodiment shown in FIGS. 1-5, there will be seen a removable guide needle 10 which comprises a one-piece elongated element having a hollow body section 12 with integral handle means 14 at one end thereof, the handle means 14 includes a pair of juxtaposed wing elements 16, 18 at the rear or distal end of the elongated hollow body section 12. At the front or proximal end of the hollow body section 12, a sharpened needle portion 20 is provided for puncturing the skin, tissues, and vein of the body where the needle 10 is inserted.

The hollow body section 12 of the guide needle 10 includes a longitudinal separation 22 along the upper surface thereof and extending throughout the entire length of the hollow body section 12 including the integral wing elements 16, 18. Preferably, the hollow guide needle 10 is also provided with a scored or otherwise weakened hinge section 24, as best seen in FIG. 5, to facilitate opening of the hollow body section 12 along the longitudinal separation 22 and about the scored or otherwise weakened hinge section 24.

The hollow guide needle 10 is preferably formed as a one-piece blank as shown in FIG. 5 and then formed into the position as shown in FIGS. 1 and 3-4. The guide needle 10 is preferably stamped or blanked from stainless steel having a thickness of 0.006 inches to provide a sanitary, noncorrosive element which has the strength and flexibility for the intended purposes. It will be understood, however, that other types of materials, such as various types of thermoplastic or combinations of metal and plastic laminates or the like may be utilized in achieving the advantages which are sought after by the present invention.

As an important feature of the present invention, the integral wing sections, which form the handle means 14, are configured and arranged to not only provide controlled insertion of the needle into the desired vein of the body, but also facilitates simple and rapid manipulative removal of the guide needle 10 from the flexible catheter tube 25 illustrated in FIG. 2 of the drawing. In FIG. 2 of the drawing, the flexible catheter tube 25 is shown as being deposited within the channel-like shaped hollow body section 12 of the needle when opened up along the longitudinal separation 22. It is to be understood that the flexible catheter tube 25 is deposited within the hollow body section 12 of the needle 10 during the insertion of the needle within the body, and after venipuncture has been made, the catheter tube is inserted into the vein, and the needle 10 is withdrawn from the body along the flexible catheter tube. As explained in the introduction of this application, many difficulties have been encountered in the guide needle once the venipuncture has been made and the catheter tube is in position.

According to the present invention the handle means 14 comprises a pair of longitudinally offset juxtaposed wing elements 16, 18 as is readily observable in the drawing. Each of the wing sections 16, 18 in the FIGS. 1-5 embodiment have a general trapezoidal configuration as can be readily depicted from an inspection of the drawing. The wing elements 16, 18 are configured to provide overlapped portions resulting from areas of the wing elements which overlap and contact each

other. This is advantageous in providing a large, relatively wide gripping area for the handle means in the insertion of and removal of the guide needle relative to a body part.

The juxtaposed wing elements 16, 18 also provide longitudinally offset portions which have been designated 16a, 18a respectively. These longitudinally offset wing portions 16a, 18a are offset and separated from one another by an amount which is sufficient to permit separation of the wing sections 16, 18 and consequent opening of the hollow element 12 along the longitudinal separation 22. The wing portions 16a, 18 thus permit grasping thereof by the nurse or attendant administering the patient for the purpose of separating the wing sections 16, 18 and opening up the hollow element 12 along the longitudinal separation 22 for removing and detaching the guide needle 10 from the catheter.

Since the guide needle 10 is preferably manufactured from thin sheet stock material, as indicated above, it is desirable to provide reinforcing struts in the wing elements, and such have been provided in the present instance and have been designated 26, 28 for the wing sections 16, 18 respectively. It will be noted that the reinforcing struts 26, 28 comprise formed grooves which are arranged in noninterfitting relationship on the wing elements 16, 18 so that these portions do not interfit one within the other. As can be seen in FIG. 4, the reinforcing struts 26, 28 are each inwardly directed embossments which provide contact means for spacing the wing sections 16, 18. It is desirable to have such means for a twofold reason, first, the struts 26, 28 provide a point or line contact between opposed struts which precludes surface adhesion of the wing sections 16, 18 thereby facilitating separation of the wing sections 16, 18 during removal from the catheter and, second, the struts 26, 28 act as protuberances which position the wing sections 16, 18 in a spaced substantially parallel relation perpendicular to the axis of the needle thereby facilitating manufacture as well as grasping of the needle by the nurse or technician during manipulative usage. Other geometric forms can be substituted to accomplish this function. This additionally precludes the grasping of the wings from altering the diameter of the inside of the needle and its resultant impingement on the catheter.

Two modified forms of the invention are shown in FIGS. 6-7 of the drawing. The hollow guide needle 30 shown in these particular embodiments, including the hollow body section 32, are similar to the hollow guide needle 10 in the FIGS. 1-5 embodiment with the exception of the handle means 34.

The two embodiments shown in FIGS. 6-7 differ in the form of the handle means 34 by the dotted and full line representations. Referring first to the embodiment depicted in full lines, it will be seen that the handle means 34 comprises rectangularly shaped wing sections 16, 18 which extend substantially normal from the hollow body section 32. Each of the wing sections 16, 18 provide the longitudinally offset and overlapped portions as in the FIG. 1-5 embodiment to achieve the desired objective of the present invention.

If desired, the wing sections 16, 18 may take other shapes and configurations as indicated by the dotted line representa-

tions as in FIGS. 6-7. It will be readily observable that the dotted lines in FIGS. 6-7, when considered in conjunction with the full line wing elements 16, 18, form triangularly shaped wing sections which are also capable of providing overlapped and offset sections as in the two embodiments previously discussed. Other configurations and arrangements, along the lines discussed, are, of course, possible within the scope of the present invention.

From the foregoing it will now be appreciated that the present invention provides a new and improved removable guide needle which provides versatility and effectiveness in use by the nurse or attendant administering the venipuncture for the purpose of either introducing or withdrawing fluids from the body of the patient.

I claim:

1. A removable guide needle for use with a flexible catheter in withdrawing or introducing fluids relative to a body, said needle comprising a one-piece, elongated, hollow element into which said catheter is inserted, said hollow element having a longitudinal separation along the length thereof and being formed to permit opening of said hollow element along said longitudinal separation, one end of said hollow element being configured for introduction into said body and the other end of said hollow element having handle means, said handle means including a pair of integral wing sections located on opposite sides of the longitudinal separation which are initially juxtaposed relative to one another with each of said wing sections having a generally trapezoidal shape, corresponding portions of each wing section overlapping one another and forming a generally rectangular shaped handle means, the remaining portions of said wing sections being longitudinally offset from one another at opposite ends by an amount sufficient to permit initial manual engagement with the offset portion to facilitate separation of said wing sections and consequent opening of said hollow element along said longitudinal separation for lateral removal and detachment from said catheter, each said wing section further including a reinforcing protuberance means extending substantially normal in a direction toward the opposite wing section at noninterfitting angles relative to the opposite protuberance whereby said protuberance means space said wing sections from each other to prevent circumferential collapse of said needle means at the position where the handle means are attached to the needle.

2. The device as set forth in claim 1 wherein one front and rear surface on adjacent trapezoidally shaped wing sections are oppositely inclined relative to one another.

3. The device as set forth in claim 1 wherein each wing section includes a channel-shaped reinforcing strut extending substantially at an acute angle relative to a line normal to said hollow elongated element.

4. The device as set forth in claim 1 wherein the opening of said needle is facilitated by a scored hinge section which is formed generally opposite said longitudinal section.

5. The device as set forth in claim 1 wherein said elongated, hollow element is formed in one piece from sheet stock material.

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