

[54] **SPLIT NEEDLE ASSEMBLY FOR CATHETER TUBE**

[76] Inventor: **Harry J. Walter**, 940 West 100th Place, Denver, Colo. 80221

[22] Filed: **Sept. 8, 1970**

[21] Appl. No.: **70,001**

[52] U.S. Cl. .... **128/214.4, 128/221, 128/DIG. 16**

[51] Int. Cl. .... **A61m 5/00**

[58] Field of Search ..... **128/214.4, 221, 347**

**References Cited**

**UNITED STATES PATENTS**

3,359,978	12/1967	Smith .....	128/214.4
2,566,499	9/1951	Richter .....	128/221
3,330,278	7/1967	Santomieri .....	128/214.4
3,382,872	5/1968	Rubin .....	128/214.4
3,550,591	12/1970	MacGregor .....	128/214.4

**FOREIGN PATENTS OR APPLICATIONS**

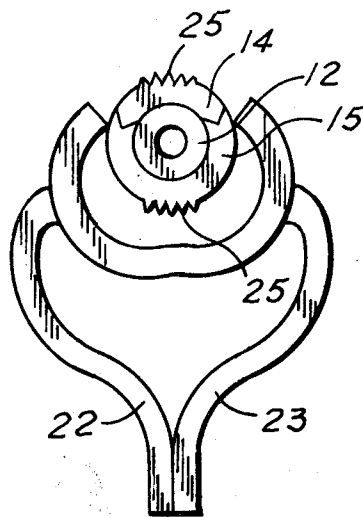
109,789 1/1968 Denmark.....128/214.4

*Primary Examiner*—Dalton L. Truluck  
*Attorney*—Reilly & Lewis

[57] **ABSTRACT**

A split needle assembly for the placement of a catheter tube in a vein includes a sectional needle which is split longitudinally into smaller and larger needle sections having complementary edges. A removable retainer at the base of the needle sections holds them together during needle insertion and withdrawal and provides a grip for the user. Once the needle is inserted the catheter tube is advanced through the needle into the vein and secured in place, after which the needle is withdrawn, the retainer removed, and the needle sections separated for complete removal from the tube.

**8 Claims, 13 Drawing Figures**



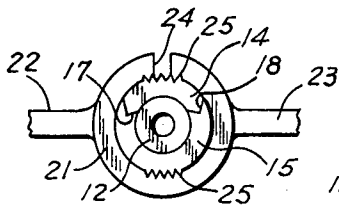


FIG. 2

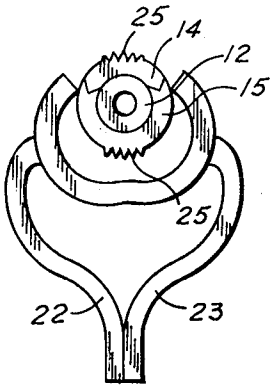


FIG. 7

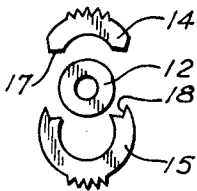


FIG. 9

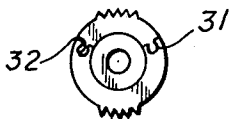


FIG. 11

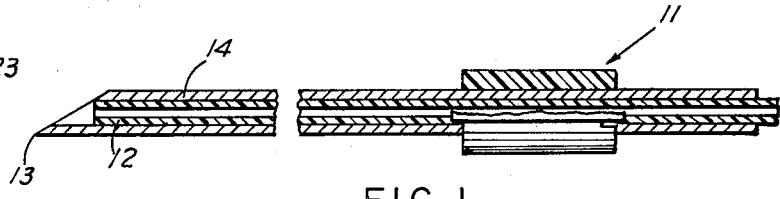


FIG. 1

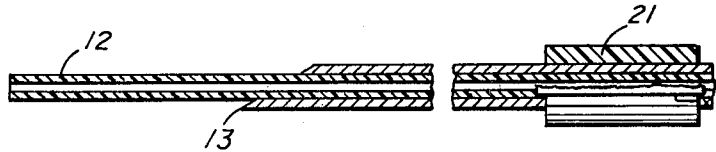


FIG. 5

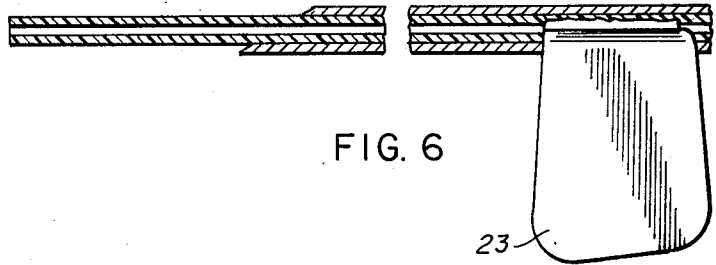


FIG. 6

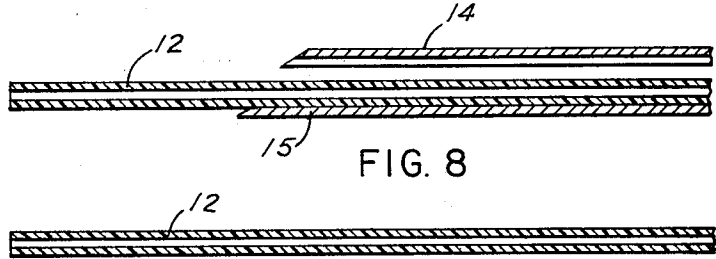


FIG. 8



FIG. 10

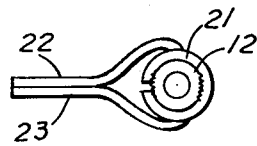


FIG. 4

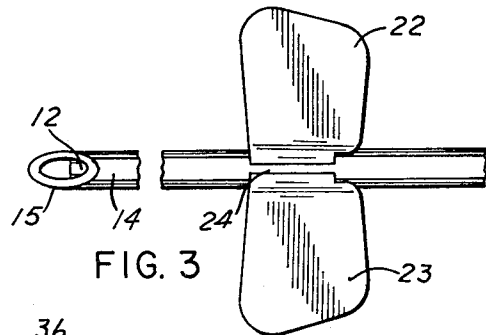


FIG. 3

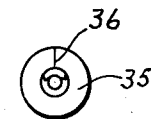


FIG. 13

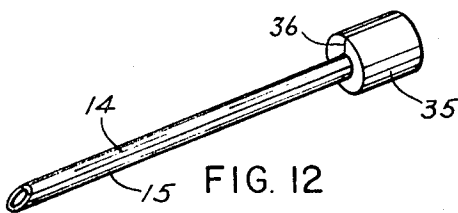


FIG. 12

INVENTOR  
**HARRY J. WALTER**  
 BY *Reilly and Lewis*  
 ATTORNEYS

## SPLIT NEEDLE ASSEMBLY FOR CATHETER TUBE

This invention relates generally to medical appliances and more particularly to novel and improved needle apparatus for the placement of catheter tubes in a vein.

In the practice of catheter tube placement it is desirable to be able to remove the needle from the catheter tube after it has been placed in the vein and secured to the patient to avoid patient discomfort and/or possible patient infection. Some attempts have been made to accomplish this result by using a split needle which is divided along a diametrical plane through the center of the needle into half sections. These half sections have flat edges and are somewhat unstable in that the half sections have a tendency to become laterally displaced. Another common practice has been to form an open slot longitudinally of the needle to permit removal from the tube after the needle insertion and withdrawal, but this arrangement has not been entirely satisfactory.

Accordingly, it is an object of this invention to provide a novel and improved needle assembly for catheter tube placement which is relatively simple and inexpensive to manufacture and in which the needle can be readily removed from the catheter tube.

Another object of this invention is to provide a split needle assembly in which the mating edges are of a tongue-and-groove edge construction to prevent possible lateral sliding separation during the application of the needle.

Yet a further object of this invention is to provide a novel needle assembly whereby a readily removable retainer for the needle sections permits positive gripping for needle insertion and withdrawal and is efficiently removed from the needle sections once withdrawn.

In accordance with the present invention, a preferred embodiment has a sectional needle divided longitudinally into a smaller section and a larger section with the smaller section being approximately one-third of the total circumference of the needle. The sections have mating, complementary edges which fit together to prevent lateral or longitudinal sliding separation and they are held together by a retainer at the base of the needle which also serves as a grip for the insertion of the needle into the vein. Once withdrawn, the retainer is removed and the needle sections can be separated for removal. One form of removable retainer is a flexible, slotted clamp-like member embracing the needle sections with oppositely disposed, outwardly directed side flaps which serve to clamp the sides against the sections when moved in one direction and tend to open the slot for removal of the needle sections when moved in the other direction. In another form the retainer is frangible and radially split so as to be removed and broken away to permit needle separation from the tube after insertion of the needle.

Other objects, advantages and capabilities of the present invention will become more apparent as the description proceeds taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a sectional view of the needle assembly with the catheter tube placed in a portion of the needle with portions broken away to show interior parts and showing the position of the needle and catheter tube during insertion into the vein;

FIG. 2 is an end elevation view;

FIG. 3 is a top plan view of the assembly of FIG. 1;

FIG. 4 is an end elevation view of the assembly with the side flaps folded to a clamping position against the needle sections;

FIG. 5 is a vertical sectional side elevation view with the needle being shown as partially withdrawn from the end of the catheter tube attached to the patient;

FIG. 6 is a side elevation view of the flaps being moved to a reversely folded position oppositely of the slot to separate the retainer from the needle;

FIG. 7 is an end elevation view of the assembly shown in FIG. 6;

FIG. 8 is a side elevation view after removal of the retainer showing the needle sections separated from the catheter tube;

FIG. 9 is an end elevation view of the assembly of FIG. 8;

FIG. 10 is an end elevation view of the catheter tube only after both the retainer and needle have been removed therefrom;

FIG. 11 is an end elevation of another form of sectional needle assembly with the catheter tube disposed therein;

FIG. 12 is another form of removable retainer arrangement for the sectional needle; and

FIG. 13 is an end elevation view of the assembly shown in FIG. 12.

Referring now to the drawings, in FIGS. 1-10 there is shown one form of sectional needle assembly generally designated by numeral 11 illustrated at different stages in relation to a catheter tube 12 for the application of the tube into the vein of a patient. The needle assembly 11 includes a hollow hypodermic needle with a tapered end terminating at a point 13 and the body of the needle is slit longitudinally to form a smaller section 14 and a larger section 15. The smaller section has a V-shaped tongue edge 17 which mates with a V-shaped groove 18 on the larger section. In size the smaller section is about one-third the total circumference of the needle, making the opening through the side of the larger section sufficiently wide to permit the sliding of the catheter tube therethrough with only a slight flexing of the tube as described hereinafter.

The removable retainer on the needle sections has a butterfly-like shape and includes a slotted flexible hollow main body 21, preferably cylindrical, having a pair of oppositely disposed flexible wings or side flaps 21 and 22 projecting outwardly from opposite sides of the slot 24. The slot 24 is in the top side of the main body and opens into a needle-receiving socket area bounded by opposed sides for the insertion of the assembled needle sections through the slot with the inner sides flexing to pass the needle sections and contracting to clampingly engage the needle sections. The outer surface of each needle section may be provided with rigid, raised serrations 25 to assist in preventing sliding movement between the retainer on the needle.

For needle insertion, the forward end of the catheter tube 12 is placed just inwardly of the needle point 13, as shown in FIG. 1, so that the tube will penetrate the vein with the point of the needle. For insertion of the needle the side flaps 22 and 23 are grasped between the fingers of the user and bent toward one another in a direction to close the slot and force the opposing side walls against the needle sections in a clamping engage-

ment, as shown in FIG. 4. After insertion of the needle into the patient's vein, the catheter tube is advanced through the needle into the vein and the tube is then secured to the patient, usually by taping it to the patient. The needle is withdrawn longitudinally of the tube, as shown in FIG. 5, leaving the end of the catheter tube 12 in the vein and secured to the patient. As shown in FIG. 7, the retainer is then removed by bending the side flaps in the opposite direction away from the slot 24 which serves to separate the side walls and enlarge the slot and the assembled needle will slip through the retainer slot. The needle sections will separate along the mating edges so as to be freed or removed from the tube as shown in FIGS. 8 and 9, thereby leaving the end of the tube secured to the patient. The catheter tube may be made of a flexible plastic and may be flexed slightly to pass through the longitudinal slot of the larger needle section.

In a modified form of interlocking sectional needle shown in FIG. 11 the smaller needle section has a generally globular male connector edge 31, and the larger needle section has a generally circular female groove 32. In this form one of the needle sections inserts longitudinally into the other and they are interlocked so they will not accidentally separate by relative lateral displacement.

In a modified form of retainer shown in FIGS. 12 and 13 the retainer takes the form of a frangible body 35 encompassing the base of the needle and is provided with a radial break line 36. This body may be made of a foamed plastic or the like which will break away from the rigid needle sections by severing it along the break line 36 after the catheter tube is in place in the vein.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure may be made without departing from the spirit thereof.

What is claimed is:

1. A split needle assembly for the placement of a catheter tube in a vein comprising a sectional needle adapted to receive a catheter tube, said needle being split longitudinally to provide an arcuate, circumferentially smaller needle section and an arcuate, circumferentially larger needle section, said sections having longitudinal edges positively disengageable from one another, said edges including mating male and female portions within the arcuate outer perimeter of the sections, and a removable retainer for releasably holding said sections together along said interfitting edges during insertion of the needle into a vein and withdrawal of the needle along the catheter tube.

2. A split needle assembly as set forth in claim 1 wherein said interfitting longitudinal edges are of a generally V-shaped tongue and groove configuration.

3. A split needle assembly as set forth in claim 1 wherein said interfitting longitudinal edges are of a generally globular tongue and groove configuration and interlock with one another.

4. A split needle assembly as set forth in claim 1 wherein said retainer releasably clamps said needle sections together.

5. A split needle assembly as set forth in claim 1 wherein said retainer is a frangible body integral with a portion of said needle sections.

6. A split needle assembly for the placement of a catheter tube in a vein comprising a sectional needle adapted to receive a catheter tube, said needle being split longitudinally to provide an arcuate, circumferentially smaller needle section and an arcuate, circumferentially larger needle section, said smaller needle section being approximately one-third of the total circumference of the needle and disengageable from the larger needle section, said sections having mating male and female edges within the outer arcuate perimeter of the sections which fit together to prevent lateral displacement between the sections, and a removable retainer at the base of said sections for releasably holding said sections together along said mating edges during the insertion of the needle into a vein and the withdrawal of the needle along the catheter tube.

7. A split needle assembly as set forth in claim 6 wherein said tongue edge is on the smaller needle section.

8. A split needle assembly for the placement of a catheter tube in a vein comprising a sectional needle adapted to receive a catheter tube, said needle being split longitudinally to provide a smaller needle section and a larger needle section, said smaller needle section being approximately one-third of the total circumference of the needle and disengageable from the larger needle section, said sections having mating tongue-and-groove edges which fit together to prevent lateral displacement between the sections, a removable retainer at the base of said sections for releasably holding said sections together along said mating edges during the insertion of the needle into a vein and the withdrawal of the needle along the catheter tube, said retainer having a butterfly-like shape with a slotted main body having flexible sides defining a socket area sized for clampingly engaging the needle sections and flexible side flaps extending outwardly from opposite sides of said main body.

\* \* \* \* \*