

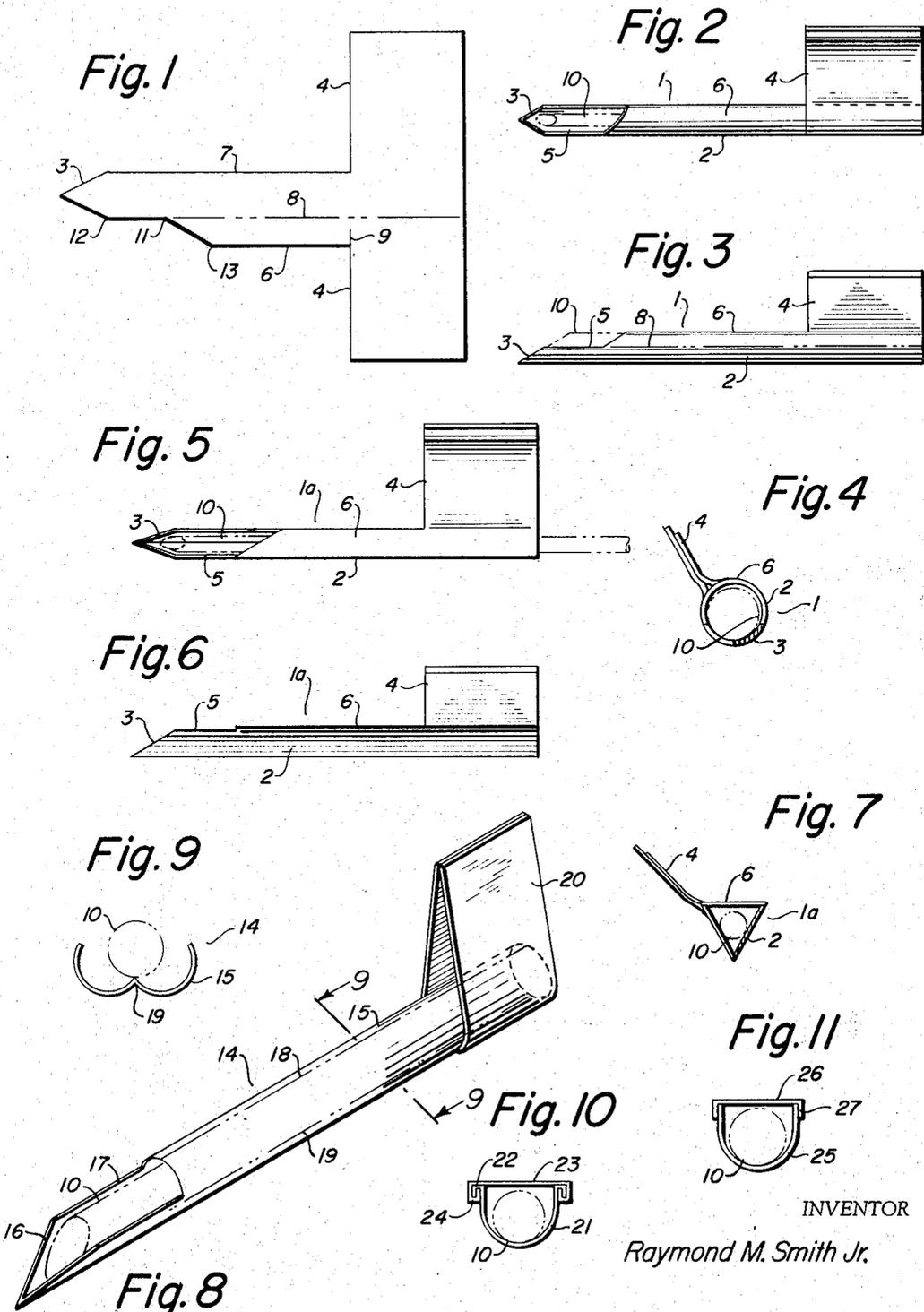
Dec. 26, 1967

R. M. SMITH, JR

3,359,978

GUIDE NEEDLE FOR FLEXIBLE CATHETERS

Filed Oct. 26, 1964



INVENTOR

Raymond M. Smith Jr.

BY

Jack Schuman

ATTORNEY

1

2

3,359,978

**GUIDE NEEDLE FOR FLEXIBLE CATHETERS**

Raymond M. Smith, Jr., 1123 N. 18th St.,  
Allentown, Pa. 18104

Filed Oct. 26, 1964, Ser. No. 406,237  
16 Claims. (Cl. 128—214.4)

**ABSTRACT OF THE DISCLOSURE**

A catheter inside a guide needle is inserted simultaneously with the needle. Afterwards, the needle is opened along a longitudinal joint and is removed laterally of the embedded catheter. In another embodiment, the top of the needle can be slid longitudinally thereof to open the needle for removal laterally of the embedded catheter. In another embodiment, a top cemented to the needle can be detached to open the needle for removal laterally of the embedded catheter.

This invention relates generally to surgical apparatus for applying a catheter tube to any required location in a body. Specifically, this invention relates to a hollow guide needle adapted for venipuncture and through which a transparent, flexible catheter tube may be inserted into a vein in a human body, the said hollow guide needle being further adapted to disclose with minimum delay blood flash back in the transparent flexible catheter indicating entrance of the guide needle and catheter into the vein, said hollow guide needle being further adapted to be removed laterally of the flexible catheter tube without disturbing any attachments which may be secured to the proximal end of said flexible catheter tube and without damaging the said flexible catheter tube.

It is a usual practice in blood transfusions, intravenous feeding and when fluids are to be withdrawn from the body to attach a tube to a hollow needle and insert the needle into a vein or other body cavity. The fluid then flows through the tube and hollow needle into the body when fluids are to be delivered therethrough or through the needle and tube when fluids are to be withdrawn.

Repeated punctures of veins with metal needles for withdrawing successive blood samples, delivering successive transfusions or intravenous feeding, tend to cause venous thromboses and subcutaneous hematomas. It has, therefore, become a common practice to leave the needle in the body for long periods of time. To prevent relative movement of the body and needle, the part of the body where the needle is inserted must be immobilized with considerable discomfort to the patient. This is especially true when the needle is inserted into a vein as, for example, in the arm, where relative movement might cause a puncturing of the vein and additional trauma. To prevent such relative movement, the arm is strapped in fixed position.

Obviously, it would be desirable to insert the end of a soft flexible catheter into a body cavity or vein, instead of a metallic needle. In fact, there have been several proposals to insert a plastic catheter into a vein or other body cavity by means of a metallic needle and then withdraw the metallic needle alone, leaving the plastic catheter in place. There have been undesirable features of one sort or another in each of the above-mentioned proposals. None of these undesirable features is found in the present invention.

One of the objects of the present invention is to provide surgical apparatus for inserting the end of a catheter to any desired location in a body.

Another object of the present invention is to provide a hollow metallic guide needle to aid in inserting a flexible

catheter into a body, which hollow metallic guide needle may then be withdrawn from the body and removed laterally of the catheter without disturbing any attachments which may be secured to the proximal end of the flexible catheter.

A further object of this invention is to provide a hollow metallic guide needle to facilitate the insertion of a flexible catheter into a body, which hollow metallic guide needle can be inserted into the body without plugging.

Yet another object of this invention is to provide a hollow metallic guide needle to facilitate the insertion of a transparent flexible catheter into a vein, which hollow metallic guide needle immediately shows blood flash back in the catheter indicating entrance to the vein.

Still another object of this invention is to provide surgical apparatus of the type indicated which is of simple and compact construction adapted for economical manufacture and which is reliable in operation.

Other and further objects of this invention will become apparent during the course of the following description and by reference to the appended claims and accompanying drawing.

Very briefly, the hollow metallic guide needle has an open trough at its distal end, is of closed perimeter behind this open trough to prevent the needle and transparent flexible catheter from buckling at various stages of operation, and is adapted to be completely opened longitudinally along the closed perimeter to permit the said needle to be withdrawn laterally (i.e., sideways, rather than longitudinally) of the flexible catheter.

Referring now to the drawing in which like numerals represent like parts in the several views:

FIGURE 1 represents a view of a developed pattern for two species of hollow guide needle.

FIGURE 2 represents a view in plan of one species of hollow guide needle.

FIGURE 3 represents a view in side elevation of the hollow guide needle of FIGURE 2.

FIGURE 4 represents a view in front elevation of the hollow guide needle of FIGURE 2, taken from the distal end.

FIGURE 5 represents a view in plan of another species of hollow guide needle.

FIGURE 6 represents a view in side elevation of the hollow guide needle of FIGURE 5.

FIGURE 7 represents a view in front elevation of the hollow guide needle of FIGURE 5, taken from the distal end.

FIGURE 8 represents a perspective view of yet another species of hollow guide needle.

FIGURE 9 represents a view in transverse section of the hollow guide needle of FIGURE 8, taken along the line 9—9 of FIGURE 8, and showing the hollow guide needle as it is opened for removal laterally of the catheter.

FIGURE 10 represents a view in transverse section of the body of still another species of hollow guide needle.

FIGURE 11 represents a view in transverse section of the body of yet another species of hollow guide needle.

Referring now to that embodiment of the present invention shown in FIGURES 2—4, hollow guide needle 1 is seen as comprising shaft 2 having sharp needle portion 3 at the distal end thereof and handle flaps 4 at the proximal end thereof. It will be particularly noted that rearwardly of needle portion 3, shaft 2 is open at the top to form a trough 5, and that rearwardly of trough 5 to handle flaps 4, shaft 2 is provided with a roof 6. In this embodiment, hollow guide needle 1 is advantageously formed from a thin metal stamping 7 or equivalent die cut piece having the pattern or outline shown in FIGURE 1 and rolled up to give shaft 2 the circular cross-section shown in FIGURE 4, the handle flaps 4 preferably

being pinched as shown in FIGURE 4 to provide a rest or stop for the tips of the thumb and forefinger of the operator and also leading off at an angle to the left, as viewed from the distal end of shaft 2 as shown in FIGURE 4, to accommodate a normally right-handed operator. This angle is preferably about 45°-60° from the vertical. It will of course be understood that stamping 7 can be reversed, and that handle flaps 4 can be pinched together to lead off at an angle to the right, as viewed from the distal end of shaft 2, to accommodate a left-handed operator. Stamping 7 is provided with a scored line shown in phantom as 8 in FIGURE 1, and with a slot 9. In manufacturing the hollow guide needle of FIGURES 2-4, stamping 7 is rolled up to form a circular cylindrical tube, and handle flaps 4 are pinched together as shown, slot 9 permitting that portion of stamping 7 below scored line 8 of FIGURE 1 (i.e., roof 6) to be completely rolled over to contact the opposite edge of shaft 2, whereby to close the perimeter of hollow guide needle 1. It will be noted that roof 6 is not joined or fastened to the opposite edge of shaft 2, for reasons which will hereinafter appear. It will be apparent that the length of slot 9 will depend upon how closely handle flaps 4 are pinched together and may under some circumstances be dispensed with.

In describing the use of the assembled hollow guide needle 1 of FIGURES 2-4, it will be assumed that a transparent flexible catheter is to be inserted into a vein. Transparent flexible catheter 10, indicated in phantom in the figures, is inserted in shaft 2 of hollow guide needle 1, the distal end of said flexible catheter 10 being adjacent needle portion 3 and being cut at a bias preferably to parallel the face of needle portion 3 as shown in FIGURE 3 (and applicable to the other species herein), said flexible catheter 10 preferably fitting substantially slidably and snugly within shaft 2 (also applicable to the other species herein). Handle flaps 4 of hollow guide needle 1 are grasped between the thumb and forefinger of one hand of the operator, and needle portion 3 carrying the distal end of flexible catheter 10 is inserted into the body towards the vein. As soon as needle portion 3 and the distal end of flexible catheter 10 enter the vein, blood from the vein appears in transparent flexible catheter 10 and can immediately be perceived in trough 5 exposing the said transparent flexible catheter 10. This blood flash back indicates immediately to the operator that hollow guide needle 1 and flexible catheter 10 have successfully entered the vein. It will be noted that needle portion 3 in its passage to the vein does not cut a plug or core from the patient (which plug or core can be forced into the vein by the flexible catheter 10 to potentially endanger the patient) as would be the case if a guide needle having a closed perimeter up to the distal end were used. Rather, needle portion 3, cutting in an open perimeter, produces a substantially U-shaped flap in the skin and tissue of the patient and flexible catheter 10 enters the vein between needle portion 3 and the U-shaped flap of skin and tissue and is inserted well into the vein by being pushed through shaft 2 as with the other hand of the operator. Thereafter, hollow guide needle 1 is withdrawn sufficiently to remove needle portion 3 from the patient. Handle flaps 4 may now be separated and used as levers of a sort to unroll hollow guide needle 1 about scored line 8, roof 6 being withdrawn from contact with the opposite edge of shaft 2, and the opened hollow guide needle 1 can be removed laterally of the flexible catheter 10 without interfering with any attachment or apparatus which may be secured to the proximal end of flexible catheter 10. Obviously, instead of scored line 8, other means of weakening shaft 2 of hollow guide needle 1 longitudinally thereof along line 8 may be employed. By providing roof 6 to close the perimeter of shaft 2 behind trough 5, two important functions are realized. Firstly, shaft 2 is given a greater section modulus and hence more strength to withstand the stress of the operation. Sec-

ondly, when flexible catheter 10 is forced between needle portion 3 and the flap of skin and tissue well into the vein, roof 6 prevents flexible catheter 10 from buckling against the friction of the vein and shaft 2 acting on the surface of said flexible catheter 10. The distal end of roof 6 (i.e., the rear or proximal end of trough 5) should be spaced from needle portion 3 sufficiently to insure that needle portion 3 can reach the vein without the distal end of roof 6 contacting or entering the body. Otherwise, the important function of trough 5 to immediately reveal blood flash back in the transparent flexible catheter 10 is lost and, also, a potentially dangerous plug or core can be cut from the patient and then pushed into the vein by catheter 10, as well as further bruising the skin of the patient. I have found that a satisfactory hollow guide needle 1 for most surgical purposes can be made with point 11 of the stamping of FIGURE 1 lying about one-half inch behind the rear of needle portion 3 represented by point 12. In the embodiment of FIGURES 2-4, the obliquely extending distal end of roof 6 may be used with advantage in that greater strength is provided shaft 2 than if roof 6 started further back towards the proximal end perpendicular to the longitudinal axis of shaft 2 and more protection against flexible catheter 10 buckling is realized. Advantageously, the angle of the distal end of roof 6, as indicated by the portion of stamping 7 of FIGURE 1 extending between points 11 and 13, is about 60° to the longitudinal axis of shaft 2 of hollow guide needle 1.

That embodiment of hollow guide needle 1a shown in FIGURES 5-7 may also be made from stamping 7 of FIGURE 1 which, instead of being rolled up into a circular cylindrical tube as for the embodiment of FIGURES 2-4, is folded to form a triangular prism as best shown in FIGURE 7, roof 6 not being joined or fastened to the opposite edge of shaft 2. Scored line 8 in this embodiment is one of the apices of the triangular prism, specifically, the apex at the upper right of FIGURE 7.

The use of that embodiment of hollow guide needle 1a shown in FIGURES 5-7 is the same as described for the embodiment of FIGURES 2-4. Again, after flexible catheter 10 has been inserted well into the vein, blood from the flap of skin and tissue (which, in this case, is V-shaped) and needle portion 3, hollow guide needle 1a is withdrawn sufficiently to free needle portion 3 from the body of the patient, handle flaps 4 are separated and used as levers of a sort to unfold hollow guide needle 1a about scored line 8, after which hollow guide needle 1a can be removed laterally of the flexible catheter 10 without interfering with any attachments which may be secured to the proximal end of said flexible catheter 10.

In that embodiment of the present invention shown in FIGURE 8, hollow guide needle 14 comprises shaft 15 which is made from tubing stock having an integrally closed perimeter (i.e., there is no unsecured or unfastened longitudinal joint in this embodiment unlike the embodiments of FIGURES 2-4 and FIGURES 5-7 between roof 6 and the opposite side of shaft 2). Such stock may for instance be drawn as through a die, or may be rolled and then welded, brazed or soldered to secure the longitudinal joint. The distal end of shaft 15 is provided with sharpened needle portion 16, and the top of shaft 15 behind needle portion 16 is milled or otherwise machined to open the same and provide trough 17 of the same extent and for the same purpose as trough 5 of the embodiments of FIGURES 2-4 and FIGURES 5-7. Longitudinal scored line 18 is provided in the top of shaft 15 as indicated in phantom in FIGURE 8 and extends from the proximal end of trough 17 to the proximal end of shaft 15. Another longitudinal scored line 19 is provided in the bottom of shaft 15, preferably diametrically opposite longitudinal scored line 18, and is of the same length as longitudinal scored line 18 (i.e., the distal end of longitudinal scored line 19 is below the distal end of longitudinal scored line 18, and the proximal end of longitudinal scored line 19 is at the proximal end of shaft 15).

Handle flaps 20 are provided at the proximal end of shaft 15 by soldering, welding or brazing a metal strip to the said shaft 15 in that area where the said strip is wrapped around the said shaft 15.

The use of that embodiment of hollow guide needle 14 shown in FIGURE 8 is generally the same as for the previously described embodiments. After flexible catheter 10 has been inserted well into the vein between the flap of skin and tissue (which, in this case, is U-shaped) and needle portion 16, hollow guide needle 14 is withdrawn sufficiently from the body of the patient to free needle portion 16, handle flaps 20 are separated and used as levers of a sort to tear or crack open shaft 15 along longitudinal scored line 18 and to unfold shaft 15 about longitudinal scored line 19, the latter acting as a sort of hinge as shown in FIGURE 9, after which hollow guide needle 14 can be removed laterally of the flexible catheter 10 without interfering with any attachments which may be secured to the proximal end of said flexible catheter 10.

The body of that embodiment of hollow guide needle shown in FIGURE 10 comprises a U-shaped trough 21 extending from the distal end to the proximal end of the hollow guide needle, the top edges of U-shaped trough being rolled over as at 22. Sliding roof 23 is provided with inturred rolled edges 24 adapted to slidably engage rolled edges 22 of U-shaped trough 21. It will be apparent that roof 23 can slide longitudinally of the U-shaped trough 21. It will be understood that the distal end of U-shaped trough 21 is sharpened as in the previously described embodiments to provide a needle portion adapted to be inserted in a body, and that handle means may be secured to U-shaped trough 21 for manipulation thereof. Obviously, whatever handle means are employed should be secured to U-shaped trough 21 so as to be clear of rearward movement of roof 23. This embodiment of hollow guide needle is used to insert flexible catheter 10 in a manner similar to the previously described embodiments and, after the needle portion thereof has been removed from the patient, roof 23 is slid back and off U-shaped trough 21, the latter then being removed laterally of the flexible catheter 10 without interfering with any attachments which may be secured to the proximal end of said flexible catheter 10. Under some circumstances, roof 23 may engage the skin of the patient as the hollow guide needle is inserted in the patient and it can be seen that a particular advantage of this embodiment is that the roof 23 will simply slide back under pressure without bruising the skin of the patient, while still providing additional strength to the hollow guide needle and still serving to prevent the flexible catheter 10 from buckling while being inserted into the patient.

The body of that embodiment of hollow guide needle shown in FIGURE 11 comprises a U-shaped trough 25 extending from the distal end to the proximal end of the hollow guide needle. Roof 26 is provided with flanges 27 overlapping the edges of U-shaped trough 25, and a cement may be interposed between the edges of U-shaped trough 25 and flanges 27 to secure the said roof 26 to said U-shaped trough 25. The cement is chosen preferably to withstand only limited stresses, such as reactions induced therein in preventing flexible catheter 10 from buckling, but not to withstand stronger stresses, whereby the roof 26 may be picked off trough 25 after the flexible catheter is in position in the patient. This embodiment may be particularly useful where the U-shaped trough 25 is strong enough itself to withstand the stresses of the operation. This embodiment of hollow guide needle is used to insert flexible catheter 10 in a manner similar to the previously described embodiments, it being understood that the distal end of U-shaped trough 25 is sharpened as in the previously described embodiments to provide a needle portion adapted to be inserted into a patient, and that handle means may be secured to U-shaped trough 25 for manipulation thereof. After flexible catheter 10 has been inserted in the patient and before or after needle

portion has been removed therefrom, roof 26 is picked off trough 25, and the latter can be removed laterally of flexible catheter 10 without interfering with any attachments which may be secured to the proximal end of said flexible catheter 10.

While I have shown the best embodiments of my invention now known to me, I do not wish to be limited to the exact structures shown and described herein but may include within the scope hereof modifications, substitutions and equivalents. Further, as my invention may be made in many different sizes and gauges, no inference as to particular dimensions is to be made from the several figures.

I claim:

1. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, said surgical apparatus comprising:

- (a) a hollow elongated member having a distal end and a proximal end,
- (b) a sharpened needle portion at the distal end of said hollow elongated member and adapted to be inserted in said body,
- (c) a portion of the wall of said hollow elongated member being open longitudinally rearwardly from the distal end of said hollow elongated member to provide a trough extending longitudinally rearwardly from the sharpened needle portion of said hollow elongated member, said trough terminating short of the proximal end of said hollow elongated member between said distal and proximal ends thereof,
- (d) a flexible catheter extending through said hollow elongated member from the proximal end thereof to a position substantially adjacent the distal end thereof, said flexible catheter being inserted simultaneously with said hollow elongated member in said body for conduction of said fluids,
- (e) means to open said hollow elongated member from end to end thereof thereby to permit said hollow elongated member to be displaced laterally of, and completely detached from, said flexible catheter.

2. Apparatus as in claim 1, said means to open said hollow elongated member comprising:

- (f) handle means secured to said hollow elongated member adjacent the proximal end thereof by means of which said surgical apparatus can be grasped, said handle means being adapted to pry open said hollow elongated member.

3. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, said surgical apparatus comprising:

- (a) a hollow elongated member having a distal end and a proximal end,
- (b) a sharpened needle portion at the distal end of said hollow elongated member and adapted to be inserted in said body,
- (c) a portion of the wall of said hollow elongated member being open longitudinally rearwardly from the distal end of said hollow elongated member to provide a trough extending longitudinally rearwardly from the sharpened needle portion of said hollow elongated member, said trough terminating short of the proximal end of said hollow elongated member between said distal and proximal ends thereof,
- (d) a flexible catheter extending through said hollow elongated member from the proximal end thereof to a position substantially adjacent the distal end thereof, said flexible catheter being inserted simultaneously with said hollow elongated member in said body for conduction of said fluids,
- (e) means to open said hollow elongated member from end to end thereof along a longitudinal line thereby to permit said hollow elongated member to be displaced laterally of, and completely detached from, said flexible catheter.

4. Apparatus as in claim 3, said means to open said hollow elongated member comprising:

(f) handle means secured to said hollow elongated member adjacent the proximal end thereof by means of which said surgical apparatus can be grasped, said handle means being adapted to pry open said hollow elongated member.

5. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, said surgical apparatus comprising:

(a) a hollow elongated member having a distal end and a proximal end,

(b) a sharpened needle portion at the distal end of said hollow elongated member and adapted to be inserted in said body,

(c) a portion of the wall of said hollow elongated member being open longitudinally rearwardly from the distal end of said hollow elongated member to provide a trough extending longitudinally rearwardly from the sharpened needle portion of said hollow elongated member, said trough terminating short of the proximal end of said hollow elongated member between said distal and proximal ends thereof,

(d) a flexible catheter extending through said hollow elongated member from the proximal end thereof to a position substantially adjacent the distal end thereof, said flexible catheter being inserted simultaneously with said hollow elongated member in said body for conduction of said fluids,

(e) a single longitudinal separable joint in said hollow elongated member,

(f) means to open said hollow elongated member from end to end thereof along said single longitudinal joint thereby to permit said hollow elongated member to be displaced laterally of, and completely detached from, said flexible catheter.

6. Apparatus as in claim 5, said means to open said hollow elongated member comprising:

(g) handle means secured to said hollow elongated member adjacent the proximal end thereof by means of which said surgical apparatus can be grasped, said handle means being adapted to pry open said hollow elongated member along said single longitudinal joint.

7. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, said surgical apparatus comprising:

(a) a hollow elongated member having a distal end and a proximal end,

(b) a sharpened needle portion at the distal end of said hollow elongated member and adapted to be inserted in said body,

(c) a portion of the wall of said hollow elongated member being open longitudinally rearwardly from the distal end of said hollow elongated member to provide a trough extending longitudinally rearwardly from the sharpened needle portion of said hollow elongated member, said trough terminating short of the proximal end of said hollow elongated member between said distal and proximal ends thereof,

(d) a flexible catheter extending through said hollow elongated member from the proximal end thereof to a position substantially adjacent the distal end thereof, said flexible catheter being inserted simultaneously with said hollow elongated member in said body for conduction of said fluids,

(e) a single longitudinal separable joint in said hollow elongated member extending from the proximal end of said trough to the proximal end of said hollow elongated member,

(f) means to open said hollow elongated member from the proximal end of said trough to the proximal end of said hollow elongated member along said single longitudinal joint thereby to permit said hollow elon-

gated member to be displaced laterally of, and completely detached from, said flexible catheter.

8. Apparatus as in claim 7, said means to open said hollow elongated member comprising:

(g) handle means secured to said hollow elongated member adjacent the proximal end thereof by means of which said surgical apparatus can be grasped, said handle means being adapted to pry open said hollow elongated member along said single longitudinal joint.

9. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, comprising:

(a) a hollow elongated member having a distal end and a proximal end,

(b) the distal end of said hollow elongated member being sharpened to provide a needle portion adapted to be inserted in said body,

(c) a line of severance in the wall of said hollow elongated member extending longitudinally thereof,

(d) a scored line in the wall of said hollow elongated member extending longitudinally thereof and weakening therealong the wall of said hollow elongated member,

(e) a flexible catheter extending through said hollow elongated member from the proximal end thereof to a position substantially adjacent the distal end thereof and adapted to be inserted in said body for conduction of said fluid,

(f) handle means secured to said hollow elongated member adjacent the proximal end thereof, said handle means being adapted to open said hollow elongated member along said line of severance and about said scored line as a hinge thereby to permit said hollow elongated member to be displaced laterally of, and completely detached from, said flexible catheter.

10. Apparatus as in claim 9, further comprising:

(g) a portion of the wall of said hollow elongated member extending longitudinally rearwardly from said distal end of said hollow elongated member being removed to provide a trough immediately behind the said needle portion.

11. Apparatus as in claim 10, further comprising:

(h) the proximal end of said trough being inclined obliquely to the longitudinal axis of said hollow elongated member.

12. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, comprising:

(a) a hollow elongated member having a distal end and a proximal end,

(b) the distal end of said hollow elongated member being sharpened to provide a needle portion adapted to be inserted in said body,

(c) a first scored line in the wall of said hollow elongated member extending longitudinally thereof and weakening therealong the wall of said hollow elongated member,

(d) a second scored line in the wall of said hollow elongated member extending longitudinally thereof and weakening therealong the wall of said hollow elongated member,

(e) a flexible catheter extending through said hollow elongated member from the proximal end thereof to a position substantially adjacent the distal end thereof and adapted to be inserted in said body for conduction of said fluid,

(f) handle means secured to said hollow elongated member adjacent the proximal end thereof, said handle means being adapted to open said hollow elongated member along said first scored line and about said second scored line as a hinge thereby to permit said hollow elongated member to be displaced laterally of, and completely detached from, said flexible catheter.

9

10

13. Apparatus as in claim 12, further comprising:  
 (g) portion of the wall of said hollow elongated member extending longitudinally rearwardly from said distal end of said hollow elongated member being removed to provide a trough immediately behind the said needle portion. 5
14. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, comprising:  
 (a) an elongated trough member having a distal end and a proximal end and a trough therein extending longitudinally thereof from said distal end to said proximal end, 10  
 (b) a roof member longitudinally slidably mounted to said elongated trough member to close at least a portion of said trough, said roof member being adapted to be slid longitudinally completely away from said elongated trough member, 15  
 (c) a flexible catheter in said trough extending through said elongated trough member from the proximal end thereof to a position substantially adjacent the distal end thereof, said flexible catheter being adapted to be inserted in said body for conduction of said fluid, 20  
 (d) the distal end of said elongated trough member being sharpened to provide a needle portion adapted to be inserted in said body, 25  
 (e) whereby said elongated trough member can be displaced laterally of, and completely detached from, said flexible catheter upon removal of said roof member from said elongated trough member. 30
15. Surgical apparatus for introducing fluid to or selectively withdrawing fluid from a body, comprising:  
 (a) an elongated trough member having a distal end and a proximal end and a trough therein extending longitudinally thereof from said distal end to said proximal end, 35  
 (b) a roof member adapted to cover at least a portion of said trough,

- (c) means removably securing said roof member to said elongated trough member,  
 (d) a flexible catheter in said trough extending through said elongated trough member from the proximal end thereof to a position substantially adjacent the distal end thereof, said flexible catheter being adapted to be inserted in said body for conduction of said fluid,  
 (e) the distal end of said elongated trough member being sharpened to provide a needle portion adapted to be inserted in said body,  
 (f) whereby said elongated trough member can be displaced laterally of, and completely detached from, said flexible catheter upon removal of said roof member from said elongated trough member.  
 16. Apparatus as in claim 15, further comprising:  
 (g) the distal end of said roof member being spaced rearwardly of the distal end of said elongated trough member.

## References Cited

## UNITED STATES PATENTS

673,598	5/1901	Dolge	-----	128—345 X
2,566,499	9/1951	Richter	-----	128—221
2,829,644	4/1958	Anderson	-----	128—221
2,842,133	7/1958	Uhma	-----	128—214.4
3,185,152	5/1965	Ring	-----	128—214.4
3,330,278	7/1967	Santomieri	-----	128—214.4

## FOREIGN PATENTS

628,292 10/1961 Canada.

## OTHER REFERENCES

Mitchell, "An Introducer for Plastic Cannulas," Brit. Med. Jour., p. 435, Feb. 23, 1952.

DALTON L. TRULUCK, *Primary Examiner*.

RICHARD A. GAUDET, *Examiner*.