# United States Patent

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[54] **CATHETER PLACEMENT UNIT**
**5 Claims, 4 Drawing Figs.**


[52] **U.S. Cl.** ..... **128/214.4,** 128/348
[51] **Int. Cl.** ..... **A61m 5/00**
[50] **Field of Search** ..... 128/214, 214.4, 348, I.C.(Digest); 206/63.2



[56] **References Cited**
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| | | | |
|---|---|---|---|
| 3,185,152 | 5/1965 | Ring | 128/214.4 |
| 3,262,448 | 7/1966 | Ring et al | 128/214.4 |



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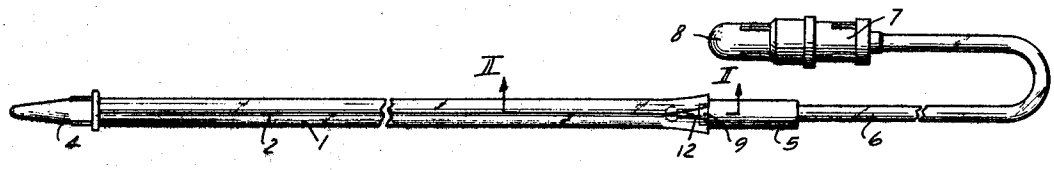
**ABSTRACT:** A catheter placement unit for the sterile insertion of a catheter into a body lumen through an incised opening in the lumen wall for parenteral infusion and other purposes, the unit having no cannulated needle, and embodying a longitudinally slit sheath with a catheter therein and an advancer connected to one end of the catheter and initially in axial alignment with said sheath to close an end thereof, the other end of said sheath being initially capped.

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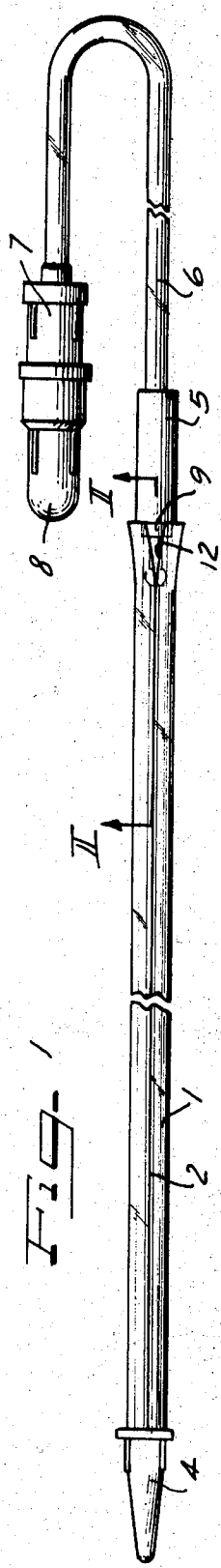


Fig. 1

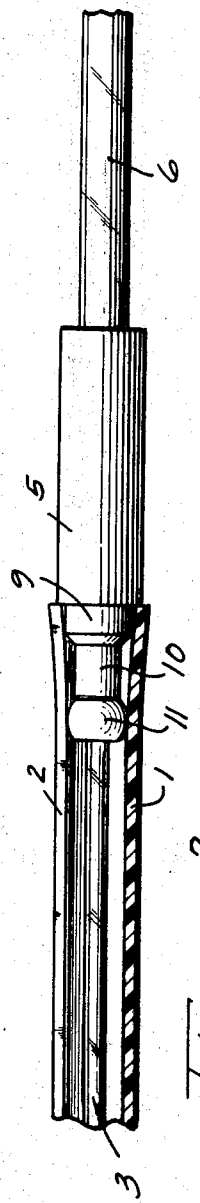


Fig. 2

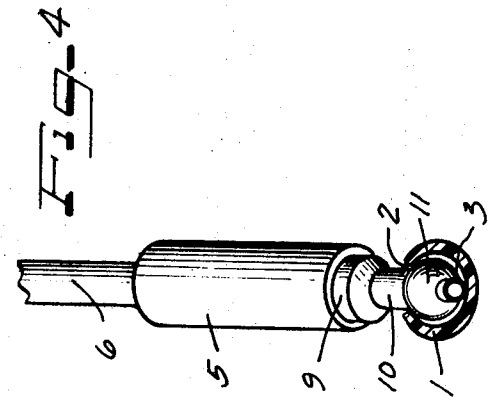


Fig. 4

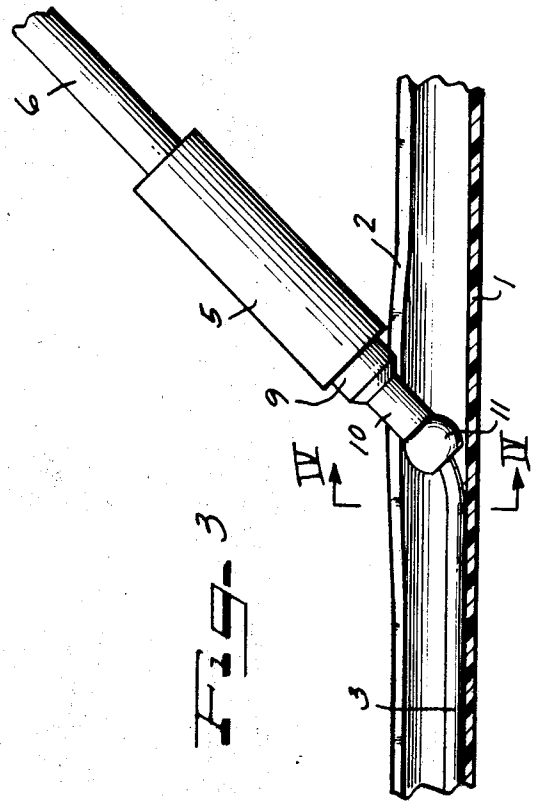


Fig. 3

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# CATHETER PLACEMENT UNIT

## BACKGROUND OF THE INVENTION

1. Field of the Invention

Pertains to the art of surgery, medicators, and particularly to a dosing device in the form of a catheter placement unit for positioning a catheter in a vein or other body lumen through an incised opening in the lumen wall, without the aid of any form of a puncturing needle telescopically associated with the catheter. The unit embodies easily operable means for placing the catheter in the lumen while maintaining the catheter in a completely sterile condition during placing, and the catheter may be placed in the lumen while infusion takes place. The unit is so constructed that it provides an exceedingly easy and rapid insertion of the catheter even under most extreme conditions.

2. Description of the Prior Art

Heretofore, catheters have been enclosed in a sheath having a slit extending lengthwise thereof so that the sheath could be disrupted as the catheter was advanced into a body lumen and then the sheath removed. A sheath of this character is shown in the Ring et al. U.S. Pat. No. 3,262,448 issued Jul. 26, 1966. However, in all such instances heretofore a needle has been telescopically associated with the catheter and the puncture in the wall of the body lumen was made by the needle and then the catheter advanced relatively to the needle. However, there are a noticable percentage of emergencies where intravenous feeding or medication is indicated and a catheter placement unit equipped with a needle cannot be utilized. In such emergency the patient is in a state of deep shock and the attending surgeon is unable to find the vein, which is practically collapsed. It is therefore necessary to reach the vein by surgery and incise the wall of the vein to provide an opening for the entrance of the catheter, and after placement in the vein the catheter is usually sewn right to the vein the catheter is usually sewn right to the vein when the incision is closed for later removal after the patient has improved. Heretofore, in such cases extreme difficulty was undergone in maintaining sterility and inserting a catheter through an incised opening. The surgeon's hands or gloves are bloody and otherwise contaminated so it was necessary for someone else to place the catheter, and even so the maintenance of sterility was quite difficult. Further, catheter placement units as heretofore utilized had a rather bulky connection between the catheter and a tube leading to the source of infusion liquid, and such bulk might add to a patient's trauma if the patient realizes that immediately upon recovering from the state of shock.

## SUMMARY OF THE INVENTION

The instant invention or discovery embodies a catheter in a sheath in the form of a conduit having a slit lengthwise thereof which maintains the catheter in a sterile condition. A cap is placed over the end of the sheath from which the catheter is advanced, and the catheter is connected to a small fitting which plugs the other end of the sheath, this fitting being connected to a flexible tube having a fitting on the end thereof for connection to the line from an infusion system. The fitting on the end of the catheter is so constructed that it cannot accidentally come out of the sheath along with a portion of the catheter during advancement of the catheter and is also so small as not to alarm a patient coming out of shock. The catheter is fully protected at all times during advancement, and the attending surgeon cannot touch the catheter during advancement and can easily hold the sheath and advance the catheter regardless of the contaminated condition of his hands or gloves. No assistant is required to place the catheter through an incised opening in a body lumen and the sterility of the catheter is completely maintained. The catheter could be placed in an incised incision even on a battlefield without any sacrifice of sterility. Thus it will be seen that the instant invention has effectively solved the problems existent in the prior art as pointed out above.



## BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of a catheter placement unit embodying principles of this invention, showing the same prior to use;

FIG. 2 is an enlarged part sectional part elevational view taken substantially as indicated by the line II–II of FIG. 1;

FIG. 3 is an enlarged view showing the position of the parts during advancement of the catheter; and

FIG. 4 is a vertical sectional view taken substantially as indicated by the line IV–IV of FIG. 3. DESCRIPTION OF THE PREFERRED EMBODIMENT

It will be understood that for purposes of clear presentation all FIGS. of the drawing are enlarged above the size the actual product is in most instances.

The illustrated embodiment of the invention includes the catheter sheath 1 which is in the form of a conduit and has a slit 2 extending lengthwise thereof. This conduit or sheath 1 is preferably made of a nonwettable plastic material, preferably extruded, polyethylene being one satisfactory material, in such a manner that it has an inherent resiliency which acts to maintain the slit 2 closed at all times, there being no physical seal necessary to maintain the sidewalls of the slit in contact. Such arrangement provides what may be termed a surface-tensioned seal, because the plastic not being wettable, surface tension of any liquid, outside or within the sheath, prevents that liquid from flowing through the relatively firmly closed slit. The closure of the slit is amply sufficient to preserve the sterility of the contents of the sheath which in this instance, will only be a catheter 3 and a portion of the fitting connected to it.

The catheter 3 is also preferably formed of a suitable plastic material and is more flexible than is the sheath. The end of the sheath out of which the catheter is advanced is initially closed by a suitable cap 4 to preserve sterility until time for use. The other end of the sheath is substantially closed by a tubular fitting 5 in one end of which the catheter is firmly secured, and in the other end of which an end of a tube 6 is firmly secured which tube terminates in a fitting 7 for connection to an infusion system, initially closed by cap 8.

The body portion of the fitting 5 is preferably cylindrical and of a relatively small diameter, but which is sufficient to be grasped by the thumb and finger of the attending surgeon and used to advance the catheter. The diameter of the body of the fitting or advancer 5 can be substantially the same as the outside diameter of the sheath 1. With reference more particularly to FIGS. 2 and 3 it will be seen at the inner end of the fitting or advancer 5 there is a section of reduced diameter providing a nipple 9 from which a still narrower neck 10 extends terminating in a ball-shaped head 11 which maintains the catheter within the sheath during advancement of the catheter. This head 11 cannot be withdrawn from the sheath directly through the slit 2 except by force much too great to be accidental.

When the unit is assembled, the nipple 9 of the catheter actuator 5 is inserted within the sheath. This insertion spreads the outer end of the sheath 1 slightly into a V-shaped opening 12, which is not sufficiently large to interfere with the retainment of sterility of the contents of the sheath. However, the opening 12 is visible to the attending surgeon and enables him to quickly locate the slit in the sheath and immediately hold the unit in the most advantageous position for advancement of the catheter into the body lumen, usually with the slit held uppermost.

In operation, the instant invention is simple and effective. After incising the vein or body lumen in its practically collapsed condition, the catheter placement unit may be utilized by the same attending surgeon regardless of the soiled and contaminated condition of his hands or gloves. The end cap 4 may be first be removed, then the end cap 8 on the fitting 7 may be removed and the fitting 7 connected to an infusion system. The infusion system may be turned on to flush out the

catheter to eliminate air and any sterilization sediment, the infusion system temporarily shut off and the end of the catheter entered into the incised opening in the body lumen. After the entrance of the catheter the infusion system is preferably turned on again so that the flow of the infusion liquid will tend to open the collapsed body lumen ahead of the catheter and permit a smooth and adequate advancement of the catheter into the lumen.

To advance the catheter into the body lumen it is a simple expedient for the attending surgeon to grasp the sheath **1**, the V-shaped opening **12** enabling him to immediately properly position the sheath in his hands, elevate the advancer or fitting **5** to the position seen in FIGS. **3** and **4** and merely push it along the sheath with the catheter steadily advancing into the lumen when the end of the sheath is reached it separates from the catheter advancer and is discarded leaving the catheter in the incised lumen and the only thing left exposed on the body of the patient is a relatively small fitting **5** which may be secured by adhesive tape to the patient's body. This requires a very short amount of time and the incision can be immediately closed with the catheter in the body lumen, permitting the entire wound to heal and the catheter may be pulled out after the patient recovers sufficiently. All danger of infection of a patient by virtue of the positioning of the catheter is eliminated.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

We claim:

**1**. A catheter placement unit for sterilely advancing a catheter through an incised opening in a body lumen without the aid of a needle cannula, including:

a sheath having a longitudinal slit therein extending throughout its entire length;

a catheter in said sheath;

a straight tubular catheter advancer disposed in axial alignment with said sheath and initially closing one end of said sheath, the other end of said sheath presenting a blunt surface;

a reduced neck portion of said advancer extending into said one end of said sheath to which an end of said catheter is firmly connected;

a retaining head on said neck portion of larger diameter than said reduced neck and axially aligned therewith within said sheath preventing complete accidental lateral withdrawal of said portion of the advancer through the slit in said sheath during advancement of the catheter; and

said advancer being tipped relatively to said sheath out of axial alignment therewith to advance the catheter, so that said reduced neck portion rides along the slit while said head remains within the sheath.

**2**. The catheter placement unit of claim **1** including, a temporary cap initially closing the other end of said sheath and removable when the unit is put to use.

**3**. The catheter placement unit of claim **1** including:

a tube secured at one end in the outer portion of said advancer for connection to an infusion system; and

a temporary cap closing said tube until the unit is put to use.

**4**. The catheter placement unit of claim **1** wherein said advancer is of substantially the same outside diameter as said sheath.

**5**. The catheter placement unit of claim **1** wherein there is a slight visible spreading of said sheath at the slit therein caused by said advancer portion extending therein and which acts as an indicator for quickly placing the unit in the proper position.