

[54] **DEVICE FOR INTRODUCING FLEXIBLE CATHETERS**

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[58] Field of Search .. 128/214.4, 221, 348, DIG. 16

[56] **References Cited**

UNITED STATES PATENTS

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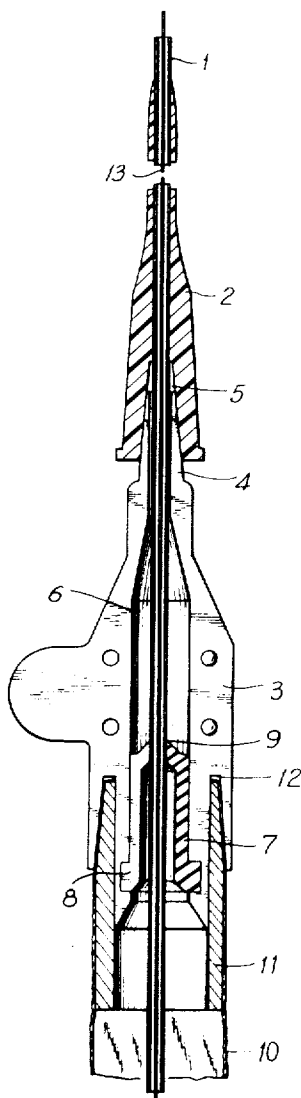
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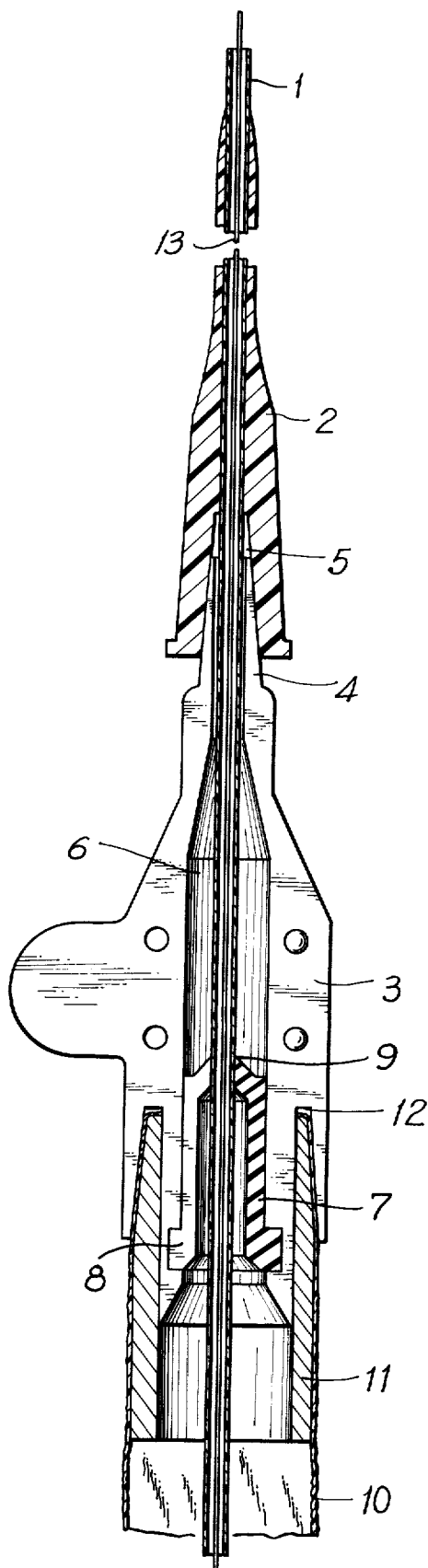
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[57] **ABSTRACT**

A device for introducing flexible catheters for intravenous infusions and transfusions consists of a plastic cannula, which is suitable for the puncture of a blood vessel, and which, in its conical attachment, has a divisible catheter guide piece with a conical top. A foil jacket hose is fixed by means of a collet in the groove of the catheter guide piece. Inside the divisible catheter guide piece a suitably cylindrical shaped part of rubber-elastic material is arranged in such a manner, advantageously by means of a flange situated in a corresponding cutout in the catheter-guide piece, that it is not displaced, the shaped part having a bore in its pointed top the diameter of which is such that the catheter can be moved therein with low resistance.

2 Claims, 1 Drawing Figure





DEVICE FOR INTRODUCING FLEXIBLE CATHETERS

This invention relates to a device for introducing flexible catheters for intravenous infusions and transfusions, which device consists of a catheter guide piece and an appliance for clamping or fixing the introduced catheter.

When a flexible catheter, which consists of a hose of plastic material, is introduced upon puncture into a vein, it can often be advanced only intermittently. In order to prevent its sliding back again, it is necessary to fix it intermittently. This necessity may also arise when the catheter is packed under sterile conditions in a thin-walled foil jacket hose which is squeezed together in the form of accordion pleats when the catheter is advanced and which has to be smoothed again by pulling it backwards from time to time. For fixing the catheter when it is introduced intermittently, devices are known which serve both as a catheter guide piece and, at the same time, as clamping device.

In German Offenlegungsschrift No. 2,151,119, FIGS. 3 and 4, a clamping device is disclosed which is connected with an extension piece or guide piece which serves to clamp the catheter hose which is then deformed when activating manually a stamp-like clamping knob.

In other clamping devices the catheter is fixed by simple compression with the aid of clamping jaws which are partly half-shell shaped.

The known devices have the drawback that with every movement of the catheter the clamping device must be manually operated and detached again in a complicated manner and that the catheter can be deformed upon too great a pressure which may cause the introduction of the catheter to fail because once a catheter is deformed it no longer can be advanced through the introduction cannula.

It is an object of the present invention to provide a device for introducing flexible catheters for intravenous infusions and transfusions which may be operated in such a manner that the above-mentioned drawbacks are avoided.

This object has been achieved in accordance with the invention by providing a device as a component part of a catheter guide piece which prevents the lateral passive directions of the catheter in both direction by its automatic braking effect, but which allows an active advancement of the catheter.

The accompanying drawing shows a cross section through the device of the invention.

Inside a divisible catheter guide piece 3, of which one half is shown in the drawing and which — in connection with a known plastic cannula 2 — serves for introducing and guiding a flexible catheter 1, a shaped part 7 (having a chamber 6) is fixed which is shown in the embodiment of the drawing and which has been prepared from a rubber-elastic material and which advantageously has a cylindrical shape and sits close to the likewise cylindrical chamber 6 of the catheter guide piece 3. The shaped part 7 is held against longitudinal movements by an integral flange 8 which is tightly fitted in a corresponding or complementary cutout or recess in the catheter guide piece. In its conically tapering top 9 the shaped part 7 has a bore through which the catheter is guided and which is dimensioned in such a manner that the catheter can be moved therein with low resistance. The degree of flexibility of this top 9 in the

shaped part 7, which is provided with a bore, is such that upon pulling or pushing back of the catheter, which fits in the bore of the shaped part with slight resistance, the flexible inner sides of the bore which are parallel to the axis of the catheter, are pulled backwards (i.e. downwardly in the drawing) and thus tilt over against the catheter so that an even greater tightening of the top 9 of shaped part 7 to the catheter surface is thus obtained which causes the desired braking effect. By suitably choosing the material for the shaped part 7 and the catheter it is possible to obtain the friction properties being most advantageous for the braking effect. When the catheter is again pushed forward, the tilted top 9 is again drawn into its original position.

Another advantage of the shaped part 7 in the catheter guide piece 3 resides in the fact that blood which flows back after the puncture of a blood vessel in the introduction cannula 2 along the catheter is stopped by the tightly closing shaped part so that it cannot flow into the foil jacket hose 10, which serves for keeping the catheter sterile, and cannot contaminate it.

For keeping the catheter sterile, the surrounding jacket hose 10 may be fixed in the groove 12 of the catheter guide piece 3 by means of a collet 11 to which the jacket hose is glued or welded. Inside the catheter there may be a stiffening mandrel 13.

It is advantageous to provide the elastic shaped part used as catheter brake with a continuous slot in longitudinal direction so that it may be separated from the catheter together with the catheter guide piece 3, which consists of two parts, when the catheter has been introduced.

Until complete introduction of the catheter the two parts of the catheter guide piece 3 are held together because the catheter guide piece is inserted with its top 4 in the conical attachment 5 of the plastic cannula 2 and embraced in its upper part by the collet 11 in the groove 12.

I claim:

1. A catheter placement unit comprising a plastic cannula adapted to be placed in a blood vessel having an attachment end portion including a generally conically shaped recess formed therein; a divisible catheter guide piece having a longitudinal bore formed therein and first and second end portions; said first end portion being conically shaped for frictional engagement in the conical recess of said cannula; said second end portion of said guide piece having a groove formed therein and a collet mounted in said groove in frictional engagement with said guide piece whereby said collet and the frictional engagement of said first end portion in said conical recess hold the guide piece together; a generally cylindrically shaped elastic element mounted in the bore of said guide piece; said element and guide piece bore having cooperating means for preventing longitudinal movement of said element in said bore, said cooperating means comprising a cooperating recess and flange; said elastic element having an internal bore formed therein and a tapered top portion tapering towards said cannula; and a catheter extending through the bore in said element and said cannula; said catheter having an outside diameter substantially equal to the inside diameter of said bore in the elastic element whereby the catheter can be moved through said element into the cannula with low frictional resistance but movement thereof out of the cannula will be resisted by inward collapse of the tapered top of the elastic ele-

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ment upon outward movement of the catheter and wherein said elastic element has a longitudinally extending slit formed therein to permit removal thereof from said catheter after placement of the catheter.

2. A catheter placement unit as defined in claim 1 5

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wherein said cooperating means comprises an annular enlargement in the bore of said guide piece defining an annular shoulder therein, and a cooperating annular flange formed on said elastic element.

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