

[54] **CATHETER PLACEMENT UNIT WITH PRESSURE CLOSURE**

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[51] Int. Cl. **A61m 5/32**

[58] Field of Search..... 128/214.4, 214.2, 221, 128/348, 349

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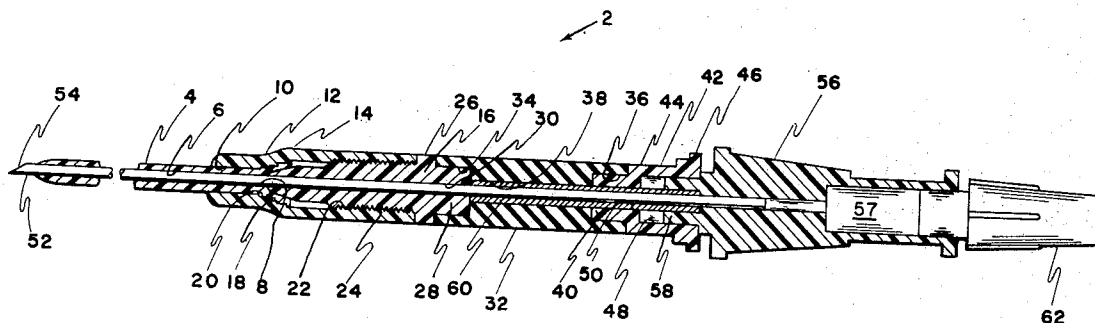
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[57] **ABSTRACT**

A catheter placement unit comprising an adapter assembly for coupling a catheter tube to a fluid infusion unit and including resilient means which are manually compressible to control the flow of fluid through the catheter tube. Two forms of the catheter placement unit are disclosed.

2 Claims, 3 Drawing Figures



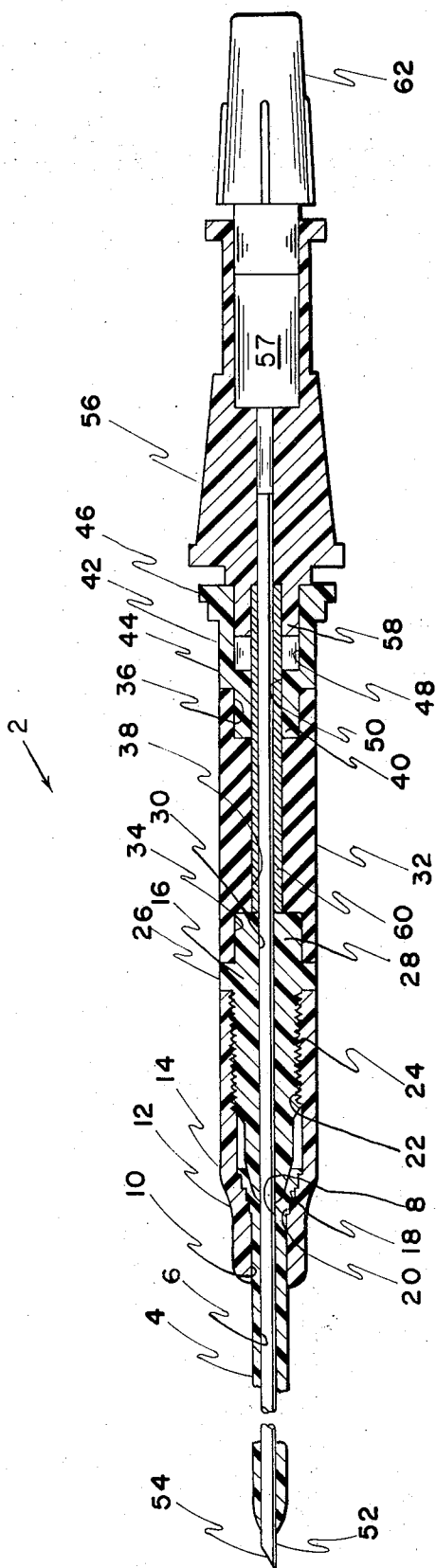


FIG. 1.

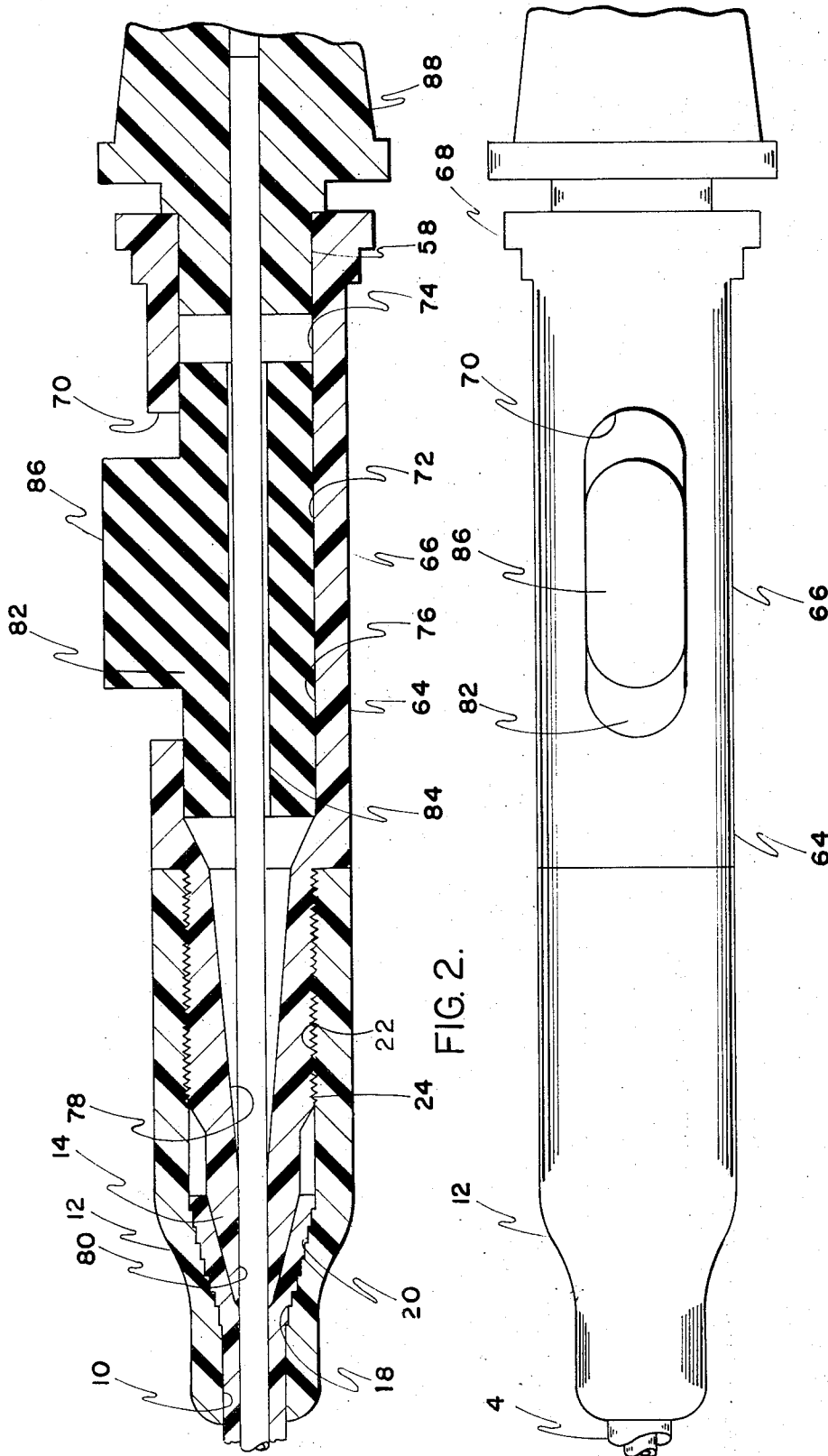


FIG. 2.

FIG. 3.

CATHETER PLACEMENT UNIT WITH PRESSURE CLOSURE

BACKGROUND

1. Field of Invention

This invention relates to catheter placement units and particularly to means for controlling blood flow during coupling of a catheter placement unit to a fluid infusion unit or the like.

2. Prior Art

In the placement of a catheter for fluid infusion and the like, it is conventional to employ a placement unit having a hollow stylet needle which extends telescopically through the catheter and has a point which projects slightly beyond the leading edge of the catheter to facilitate venipuncture. Once the venipuncture has been achieved and the catheter suitably placed, the needle is withdrawn from the catheter and the catheter is coupled to the fluid infusion unit. When the venipuncture is achieved, the blood pressure in the patient's vein forces blood through the needle and it is customary to provide the needle with a transparent portion which permits observance of this "blood flashback" to indicate that venipuncture has been obtained. Unfortunately, as the needle is withdrawn, blood also flows through the interior of the catheter and, since the free end of the catheter is open for some moments, while the needle is removed and the infusion unit is attached, this blood frequently escapes and causes staining of clothing and bed linens. Moreover, should a delay occur for any reason, between removal of the needle and attachment of the infusion unit, the loss of blood through the catheter could become serious. In instances where the needle remains indwelling, the needle is provided with a removable plug to permit attachment of the infusion unit and the foregoing problems are presented during removal of this plug.

BRIEF SUMMARY AND OBJECTS OF THE INVENTION

These disadvantages of the prior art are overcome with the present invention and an angiocath is provided which includes means for manually controlling the flow of blood therethrough.

The advantages of the present invention are preferably attained by providing a fitting adjacent the free end of the catheter having a tubular portion communicating with the bore of the catheter and formed of resilient material which can be manually pressed to prevent passage of blood therethrough.

Accordingly, it is an object of the present invention to provide an improved catheter placement unit.

Another object is to provide improved means for coupling an indwelling catheter to a fluid infusion unit or the like.

A further object of the present invention is to provide means for preventing undesired flow of blood through a catheter placement unit.

An additional object of the present invention is to provide means for manually controlling the flow of blood through a catheter placement unit.

A specific object of the present invention is to provide a catheter placement unit comprising a fitting connected adjacent the free end of the catheter having a tubular portion communicating with the bore of the catheter and formed of resilient material which can be

manually pressed to prevent passage of blood therethrough.

These and other objects and features of the present invention will be apparent from the following detailed description, taken with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a vertical section through a catheter placement unit, embodying the present invention;

FIG. 2 is a vertical section through a modified form of the placement unit of FIG. 1; and

FIG. 3 is a plan view of the placement unit of FIG. 2.

DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENTS

In that form of the present invention chosen for purposes of illustration in FIG. 1, a catheter placement unit is shown, indicated generally at 2, comprising a catheter tube 4 having an axial bore 6. One end 8 of the catheter tube 4 extends through the bore 10 of a locking ring 12 and is forced onto the tapered male end portion 14 of an adapter 16. Preferably, the bore 10 of the locking ring 12 has an enlarged tapered portion 18 formed with a plurality of annular steps or shoulders 20 and terminating in an internally threaded portion 22 which mates with an externally threaded portion 24 of adapter 16 to secure the catheter tube 4 to the adapter 16, as disclosed in the copending application of James C. Loveless, Ser. No. 884,107, filed Dec. 11, 1969, now abandoned, and assigned to the present assignee. The catheter tube 4 may be permanently secured to the locking ring 12 and adapter 16 by means of a suitable epoxy or the like. The adapter 16 is formed with a radial flange 26 having an external diameter similar to that of the locking ring 12 and is formed with a rearwardly projecting stud 28 of lesser diameter than the flange 26. An axial bore 30 extends completely through the adapter 16 and communicates with the bore 6 of the catheter tube 4. A cylindrical sleeve 32, formed of resilient material, is provided at its opposite ends with axial recesses 34 and 36 having internal diameters substantially equal to the diameter of stud 28 of the adapter 16, which seats in recess 34 of sleeve 32 and is secured thereto by epoxy or other suitable means. The sleeve 32 has an external diameter similar to locking ring 12 and flange 26 of adapter 16 and is formed with an axial bore 38 communicating with the recesses 34 and 36 and the bore 38 has a larger diameter than the bores 6 and 30 of the catheter tube 4 and adapter 16, respectively. Recess 36 of sleeve 32 mates with a projection 40 on the forward end of a coupling member 42 and is secured thereto by epoxy or the like. The coupling member 42 has a central portion 44 having an external diameter similar to sleeve 32, locking ring 12 and flange 26 of adapter 16. In addition, coupling member 42 is formed with a radially projecting flange portion 46 which is adapted to provide conventional Luer lock dogs. Internally, coupling member 42 has an axial recess 48 formed in the rear end thereof which is dimensioned to provide a friction fit with the male end portion of a fluid infusion tube or the like. A bore 50 communicates the forward end of coupling member 42 with the recess 48 and the diameter of the bore 50 is substantially identical with that of bore 38 of sleeve 32. A hollow stylet needle 52 has a beveled leading end

point 54 and extends telescopically through bore 6 of the catheter tube 4, bore 30 of adapter 16, bore 38 of sleeve 32, and bore 50 of coupling member 42 and is molded or otherwise permanently secured to a rigid needle hub 56. The needle hub 56 is formed with a coupling projection 58 which is dimensioned to frictionally engage the recess 48 of coupling member 42. In addition, a rigid stabilizer portion 60 is dimensioned to extend, in sliding relation, through bore 50 of coupling member 42 and bore 38 of resilient sleeve 32, to abut the rear end of stud 28 of adapter 16. Aside from the coupling projection 58 and stabilizer portion 60, the needle hub 56 may be conventional and will include a flashback chamber, 57, communicating with the bore of the needle 52, the flashback chamber also comprising a coupling recess for removably receiving a flow control plug 62 or the male end portion of a fluid infusion tube. The needle 52 is permanently secured to the needle hub 56 in a conventional manner as is the sleeve 60.

In use, with the placement unit 2 assembled, as shown in FIG. 1, the needle 52 and stabilizer portion cooperate to provide a rigid structure which may be employed to perform a venipuncture in a conventional manner. When it is desired to remove the needle 52, the doctor grips the resilient sleeve 32 with the thumb and forefinger of one hand and grips the needle hub 56 with the other hand and proceeds to move the needle hub 56 away from the coupling member 42, thereby withdrawing the needle 52. As the needle 52 is withdrawn, the stabilizer portion 60 is withdrawn from bore 38 of resilient sleeve 32. This allows the sleeve 32 to be compressed, thereby reducing the effective size of bore 38. As the needle 52 is withdrawn through the sleeve 32, the sleeve 32 is further compressed to close bore 38 and prevent flow of blood therethrough. The needle 52 may, then, be completely withdrawn and a suitable fluid infusion tube or the like may be attached to coupling member 42. Thereafter, the resilient sleeve 32 is released and resumes its normal shape, whereupon, fluid can flow freely through bore 38 of sleeve 32 and through bore 30 of adapter 16 to bore 6 of the catheter tube 4. Subsequently, if it is desired to substitute a different infusion fluid, for example, the fluid flow may readily be halted, by compressing sleeve 32 in the manner described, and the substitution may be made without fear of staining bed linens or clothing and without the danger of loss of blood from the patient.

FIGS. 2 and 3 illustrates an alternative form of the present invention. In this form of the invention, a modified adapter 64 is employed and is formed generally cylindrical, as shown, with an external diameter similar to that of the locking ring 12. The adapter 64 has a tapered male portion 14 and threaded portion 24, identical to those of adapter 16 of FIG. 1, and is attached to the catheter tube 4 and locking ring 12 in the manner described with respect to adapter 16 of FIG. 1. The modified adapter 64 has a cylindrical body portion 66 formed with a Luer lock flange 68 projecting radially adjacent the rear end thereof and having an opening 70 formed in one side of the body portion 66 intermediate the length thereof. The modified adapter 64 has a bore 72 extending completely therethrough and which is preferably formed with a slightly divergently tapered wall at rear portion 74, a central portion of uniform diameter 76, and a sharply tapered forward portion 78 terminating at the leading end of the male portion 14

in an opening 80 which is substantially equal in diameter with the bore 6 of catheter tube 4. The side opening 70 communicates the central portion 76 of bore 72 with the exterior of the adapter 64. A generally cylindrical valve member 82 is located in the central portion 76 of bore 72 and has an external dimension substantially equal to the diameter of central portion 76 of bore 72. Preferably, the valve member 82 is permanently secured within the central portion 76 of bore 72 by epoxy or the like. The valve member 82 is composed of resilient material and is formed with a bore 84 extending axially therethrough and having a diameter similar to that of the bore 6 of catheter tube 4. In addition, the valve member 82 is formed with a projection 86 which extends through opening 70 and preferably projects a slight distance beyond the exterior of adapter 64. The rear portion 74 of bore 72 of adapter 64 is formed to frictionally receive the male end portion of a fluid infusion tube or the like, not shown. The needle hub 88 is substantially identical with the needle hub 56 of FIG. 1, except that the stabilizer portion 60 is omitted.

In use, the assembled placement unit is employed to perform a venipuncture in the usual manner. When it is desired to remove the needle 52, the doctor grips the adapter 64 with one hand, placing the tip of one finger on the projection 86 of valve member 82, and grips the needle hub 88 with the other hand. As the needle 52 is withdrawn through the placement unit, the doctor applied pressure to projection 86 which, upon passage of the needle 52, serves to close the bore 84 of the valve member 82 to prevent passage of blood therethrough. Thereafter, the needle 52 may be completely withdrawn and the male portion of the fluid infusion unit may be attached to tapered portion 74 of bore 72 of the adapter 64. Upon release of the pressure from projection 86, valve 82 and bore 84 resume their original shapes and fluid can flow freely through bore 84.

Obviously, numerous variations and modifications may be made without departing from the present invention. Accordingly, it should be clearly understood that the forms of the present invention described above and shown in the accompanying drawing are illustrative only and are not intended to limit the scope of the invention.

What is claimed is:

1. A stylet catheter assembly comprising:

a catheter tube having an axial bore;
elongated piercing means coaxially disposed through and extending beyond the bore of the catheter tube;

a hollow body affixed to the proximal end of the catheter tube through which the piercing means also coaxially passes, the hollow of the body being in fluid communication with the bore of the catheter tube and the proximal end of the hollow body comprising an infusion female fitting;

the hollow body comprising a yieldable occluding hollow section with memory forward of the female fitting which upon being manually squeezed against the piercing means fully collapses and occludes the hollow of the body immediately upon axial removal of the piercing means from the catheter tube and the occluding hollow section, to prevent blood loss after venipuncture following piercing means removal before infusion attachment at the female fitting;

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means attached to the proximal end of the piercing means and sleeve means attached to said attached means and concentrically interposed between the piercing means and the occluding hollow section so that as the piercing means are removed by manual manipulation of the attached means, the sleeve means will be removed from its interposition between the occluding hollow section and the piercing means.

2. A stylet catheter assembly comprising:
a catheter tube having an axial bore;
elongated piercing means coaxially disposed through and extending beyond the bore of the catheter tube;
a hollow body affixed to the proximal end of the catheter tube through which the piercing means also coaxially passes, the hollow of the body being in fluid communication with the bore of the catheter tube and the proximal end of the hollow body com-

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prising an infusion female fitting;
the hollow body comprising a yieldable occluding hollow section with memory forward of the female fitting which upon being manually squeezed against the piercing means fully collapses and occludes the hollow of the body immediately upon axial removal of the piercing means from the catheter tube and the occluding hollow section, to prevent blood loss after venipuncture following piercing means removal before infusion attachment at the female fitting;
a portion of the hollow body substantially surrounding the occluding hollow section, and the occluding hollow section comprising a projection extending through an opening in the hollow body and exposed to be manually depressed to occlude the hollow of the section as specified.

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