A further object of the present invention resides in the provision of an improved insertion device for a flexible catheter having a rigid wall cannula disposed about the catheter and with means on the cannula to provide selective gripping action between the cannula and catheter for unit insertion of the cannula and catheter into an orifice.

An additional object of the present invention resides in the provision of an improved insertion device for a flexible catheter that is economical to manufacture, easy to use, durable in use and that is easily separated from the catheter after use for disposal.

THE DRAWINGS

The present invention, together with further objects and advantages thereof, will best be understood by reference to the detailed description of the invention set forth herein in conjunction with the drawings, in which:

FIGURE 1 is a side elevation of the device of the present invention, partially fragmented, and showing the catheter, cannula and pressure member of the invention;

FIGURE 2 is a fragmentary top elevation of the device of FIGURE 1 showing the slot in the wall of the cannula for separation of the cannula and catheter;

FIGURE 3 is a fragmentary enlarged view of the cannula and catheter assembly of the device of FIGURE 1 showing the wall slot of the cannula in greater detail;

FIGURE 4 is a fragmentary view of one end of the cannula, schematically shown to be slightly flared, and showing the outline of the pressure member associated with said one end of the cannula;

FIGURE 5 is an enlarged sectional view of the device of FIGURE 1 through the pressure member of the device illustrating the gripping means of the pressure member in its static position and with the projection or gripping means thereon being out of engagement with the catheter;

FIGURE 6 is a fragmentary view of the member of FIGURE 5 showing the gripping means in gripping position and in engagement with the catheter to define a unit structure between the catheter and cannula;

FIGURE 7 is an enlarged sectional view of the cannula-catheter assembly, and

FIGURE 8 is a sectional view like FIGURE 7 showing separation of the cannula and catheter by withdrawal of the catheter through the wall slot of the cannula.

Refferring more particularly now to the drawings, the improved catheter inserter device is indicated generally at 10 and includes a cannula 12, catheter 14 and pressure member 16. The catheter 14 is telescopically received within the cannula 12, as indicated in the partially sectioned view of FIGURE 1, said cannula 12 defining a central opening 18 to receive the catheter 14.

As shown in FIGURES 2 and 3 the cannula 12 is provided with a slot 20 extending through the wall and defining access to the central opening 18 of the cannula 12.

The catheter 14 may be a flexible plastic tubing of any given length with one end 22 of the catheter having a female luer taper associated therewith and with the other end 24 of the catheter beveled to permit ready access and movement within the catheter. As stated above, the catheter 14 is readily flexed and does not have sufficient inherent rigidity to be self-supporting. Accordingly, the catheter, by itself, is difficult to work with when moving it axially and particularly when attempting to move it into a constricted area that even moderately resists passage of the catheter. It should be noted that once the catheter is within a fluid carrying channel and fluid is introduced to and flows along the catheter, the walls of the catheter will be supported against collapse or flexing by the kinetic pressure of the fluid and thereby will be provided with auxiliary supportive rigidity internally rather than externally.
The cannula 12 is defined by a rigid wall member with the slot 20 extending axially along the wall thereof. The cannula may be of stainless steel or other suitable relatively rigid material. For example, inert plastic materials may be substituted for stainless steel if medically acceptable for such use.

The cannula 12 may be sharpened at one end thereof in the same manner as a standard phlebotomy needle for ease of insertion of the cannula and catheter combination to the orifice or restricted channel. A pressure member 16 is secured to the cannula 12 in the manner shown in FIGURE 5 of the drawings. The pressure member 16 is defined by a body section 30 having an opening 32 therein, which, when the member 16 is in assembled relation on the cannula 12, is in registration with the slot 20 of the cannula to define the opening of the central tube opening 18 of the cannula to the exterior surface of the pressure member 16.

One edge of a flap 34 is secured to the body section 30 of the pressure member 16 in its relaxed condition. The flap 34 is biased to the position shown in FIGURE 5 with the projection 38 of said flap 34 being deformed partially out of the opening 32 so that it will not extend into any portion of the opening 18 of cannula 12. The flap 34 may be integrally molded along said one edge 40 to define the hinge structure for pivotal support of the flap. Additionally, a spring member (not shown) may be molded within the flap 34 and body 30 to provide means for biasing said flap upwardly to the static position shown in FIGURE 5 of the drawings.

The projection 38 of the flap 34 is adapted, when the flap 34 is closed as in FIGURE 6, to move into the central opening 18 of the cannula 20. As the flap 34 is folded into the body 30 of the pressure member 16 the projection 38 is forced into the opening 13 of said member and partially projects into the opening 18 of the cannula 12. The projection 38, when the flap 34 is closed, engages the catheter 14 and defines a frictional gripping engagement between said projection and the catheter. Accordingly, as the pressure member 16, cannula 20 and catheter 14 are locked into inter-gripping relation to define a unitary structure thereby permitting unit insertion of the cannula and catheter into an orifice with the sharpened end of the cannula 20 in complete registration with the slot of the rigid wall cannula and wherein the pressure member includes a projection which may selectively be moved into and out of registration with the central opening of the cannula of the device to define a restricted area in the cannula opening.

The device of claim 5 wherein the projection is adapted to capture the catheter axially within the cannula opening to define an axially unitary structure and thereby permit unit insertion of the cannula and catheter into an orifice.

References Cited

FOREIGN PATENTS

322,426 12/1929 Great Britain.

OTHER REFERENCES


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