

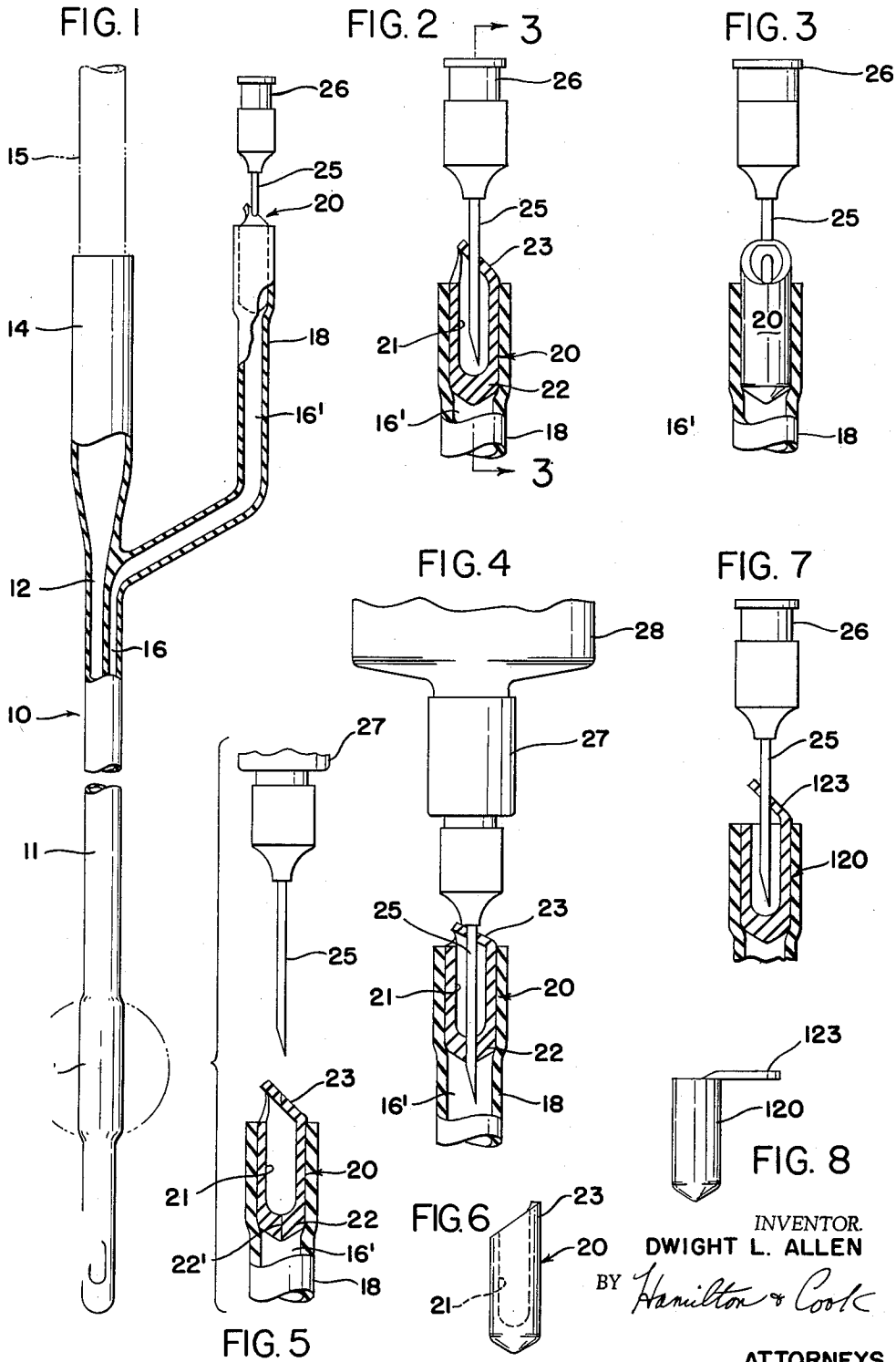
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NEEDLE PLUG GUIDE FOR CATHETER

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NEEDLE PLUG GUIDE FOR CATHETER

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The invention relates generally to surgical catheters, and more particularly to retention catheters having a rubber drainage tube provided with a retention balloon near its tip end and a branch injection tube at its other end connected to the balloon through a separate duct in the drainage tube. Catheters of this type are sometimes known as "Foley Catheters."

The outer end or funnel of the branch tube has been provided with a sealing plug of rubber latex, and in order to inflate the rubber balloon after the catheter has been inserted into a patient's body a hypodermic needle is inserted axially through the plug by the surgeon and water forced through the needle by a syringe to inflate the balloon. When the needle is withdrawn the plug, aided by the radial compression of the outer tube, is intended to be self-sealing against any leakage of the water from the balloon, which would obviate the retention feature.

Difficulty has been experienced in preventing the needle from piercing angularly through the plug and side wall of the surrounding branch tube, resulting in leakage from the balloon, because proper insertion of the needle axially through the plug is an operation requiring care and a certain amount of skill and patience, at a time when fast action is necessary, as, for example, to control hemorrhaging.

It is therefore an object of the present invention to provide a retention catheter having novel plug guide means to hold a hypodermic needle in position axially to pierce the plug wall, so that the surgeon may instantly force the needle through the wall without having to locate or orient the needle.

A further object is to provide novel plug guide means in which the hypodermic needle can be properly positioned by the manufacturer of the catheter and transported to the surgeon in readiness for instant piercing of the plug wall.

A still further object is to provide novel plug guide means to hold a hypodermic needle in piercing position and adapted for use in conventional retention catheters.

These and other objects are accomplished by the improvements comprising the present invention, preferred embodiments of which are shown by way of example in the accompanying drawing and described in detail herein. Various modifications and changes in details of construction are included within the scope of the invention as defined in the appended claims.

The novel needle plug guide and holder comprises a hollow latex rubber plug compressively held in the branch tube funnel of a catheter and having a transverse self-sealing wall at its inner end and an axial bore for guiding a needle point toward said wall, the outer end of said plug having a flexible lip bendable in overhanging relation to said bore through which the needle extends and which holds the needle point in the bore in readiness for axially piercing said sealing wall.

Referring to the drawings:

FIG. 1 is an elevational view, partly broken away and in section, showing a retention catheter embodying the invention.

FIG. 2 is an enlarged fragmentary cross-sectional view showing a needle held in a plug guide in the branch tube funnel in readiness for piercing the plug wall.

FIG. 3 is a view on line 3—3 of FIG. 2.

FIG. 4 is a view similar to FIG. 2 showing a syringe

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coupled to the needle and the needle piercing the plug wall to inject liquid through the branch tube.

FIG. 5 is a similar view showing the needle withdrawn.

FIG. 6 is a detached view of the plug guide of FIGS. 1—5.

FIG. 7 is a view similar to FIG. 2 showing a modified plug guide.

FIG. 8 is a detached view of the plug guide of FIG. 7.

Referring to FIG. 1, a retention catheter of the "Foley" type is indicated as a whole at 10, and has a main tube 11 with a drainage duct 12 for draining body fluids from the apertured tip 13 to the outlet end 14, which may be attached to an extension tube 15 leading to a suitable receptacle.

The tube 11 has a separate passage or duct 16 which communicates with the interior of an inflatable bag or balloon 17 through which the drainage duct 12 extends without communicating therewith. Adjacent to the outer end 14 of the main tube a branch tube 18 connects to the main tube, and has a duct 16' communicating with the duct 16. Fluid such as water is injected through branch tube 18 to inflate the balloon 17, as indicated in phantom lines, which serves to retain the catheter within the patient's body. In accordance with usual practice, the branch tube is provided with a self-sealing plug and the water injected by means of a syringe having a hypodermic needle piercing the plug. After the balloon 17 is inflated the needle is withdrawn and the plug seals the duct 16' to maintain the balloon inflated. When the balloon is to be deflated for removal of the catheter, the needle is again inserted through the plug and the syringe operated to suck the water from the balloon.

The novel needle guide plug of the present invention is indicated generally at 20, and has an axial bore 21 open at the outer end of the plug and closed at its inner end by a transverse wall 22. The plug is made of soft, self-sealing elastic material, such as rubber latex, so that the wall 22 will be easily pierced by a needle and be self-sealing when the needle is removed and yet the surface of the bore has sufficient firmness to guide the point of the needle substantially axially toward the wall 22. Rubber latex has this self-sealing characteristic which is augmented by yieldingly distending the funnel or open end of the branch tube when the plug is inserted therein, so that the resiliency of the tube exerts a radial compression on the wall 22 of the plug. The sealed opening after withdrawal of the needle is indicated at 22' in FIG. 5.

The outer end of the plug 20 has a lip portion 23 on one side thereof which is easily flexed into an overhanging position with respect to the bore 21, as shown in FIGS. 2—4. In the form of plug shown in FIGS. 1—6, the lip 23 is formed by cutting off the outer end of the plug in a direction inclined to the axis of the plug, forming the lip at the outermost portion, as indicated in FIG. 6. In the modified form of plug 120 shown in FIGS. 7 and 8, the lip 123 is formed as a lateral extension from one side of the upper end of the plug.

The lip 23 or 123 provides a holding means for positioning a hypodermic needle 25 in readiness to pierce the wall 22 of the plug 20, as shown in FIGS. 2 and 3, whereby the manufacturer of the catheter may position a needle when the catheter is placed in a sterile package for shipment. The needle is preferably of a well-known quick coupling type which has an upper end 26 adapted to be quickly coupled by the surgeon to the end fitting 27 of a conventional syringe 28. The surgeon then forces the point of the needle through the wall 22 of the plug and instantly injects the fluid, without having to take the time to locate the bore 21 and carefully insert the needle axially therein.

The flexible and resilient lip holds the needle within the bore 21 of the plug with the point of the needle spaced

from the wall 22, so that the wall is not pierced by accidentally bumping the needle before intended use. Thus, the needle is properly positioned within guiding bore 21 in readiness for the surgeon to pierce the wall 22 axially merely by pushing inwardly on the needle.

If the needle were held in piercing position without providing a lip, as by entering the point part way into the wall 22, accidental bumping of the outer end of the needle would in some cases cause the needle to fall out, and in other cases completely pierce the wall, in which latter case after a normal time in storage the wall would tend to lose its self-sealing property when the needle is withdrawn, causing leakage.

In use, the catheter is shipped in a sterile package with a hypodermic needle positioned for instant use, as shown in FIGS. 2 and 3. The surgeon attaches a syringe, injects the water to inflate the balloon and withdraws the needle, all in a few seconds. When it is desired to remove the catheter from the patient, the needle with the syringe attached is reinserted through the pierced opening 22' and the syringe operated to suck the water out of the balloon and deflate it.

The novel needle plug guide provides a simple and inexpensive needle holding and guiding means for retention

catheters, and accomplishes a valuable time-saving in use while prolonging the storage life of the catheter.

What is claimed is:

1. In combination with a retention catheter having a fluid injection tube branch with an open outer end, a hollow plug inserted in said open end and radially distending said tube, said plug having an outwardly open bore and a transverse self-sealing inner end wall, a flexible lip portion on the outer end of said plug overhanging said bore, and a hypodermic needle extending through said lip into said bore with its point adjacent said end wall, said lip yieldingly holding said needle in position for axially piercing said end wall.

2. In the combination of claim 1, a hollow plug in which the lip portion is formed as a lateral extension from one side of the open end of the plug.

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