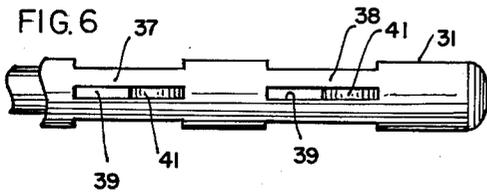
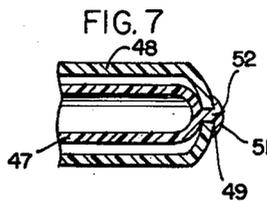
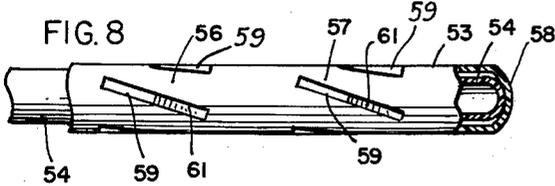
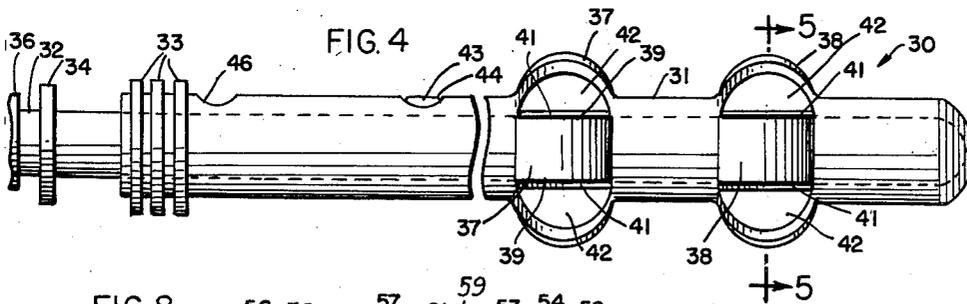
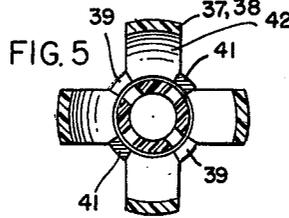
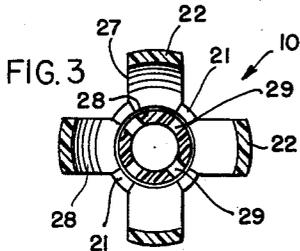
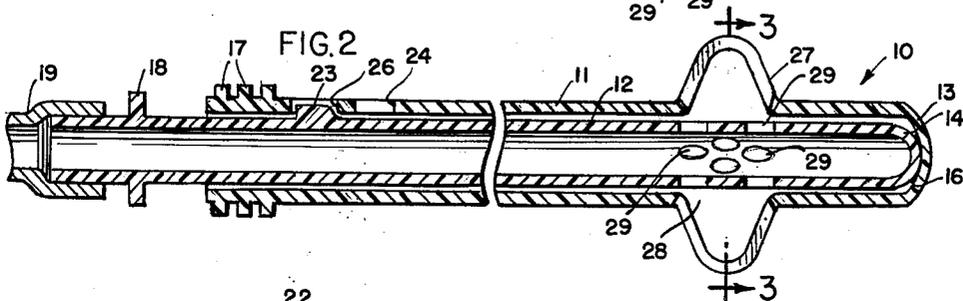
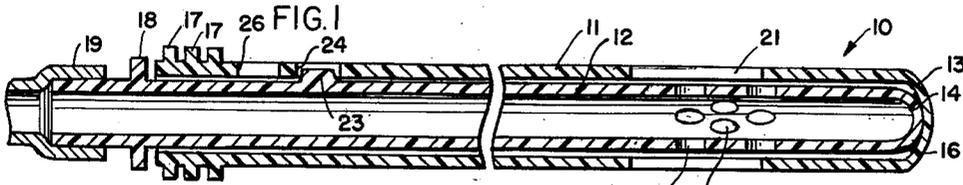


Oct. 29, 1963

A. P. OVERMENT  
RETENTION CATHETER  
Filed Aug. 8, 1960

3,108,595



INVENTOR:  
ALFRED P. OVERMENT  
BY  
*Sumner & Snow*  
ATT'YS

1

3,108,595

RETENTION CATHETER

Alfred P. Overment, 4016 N. Central Park Ave.,  
Chicago 18, Ill.

Filed Aug. 8, 1960, Ser. No. 48,186  
6 Claims. (Cl. 128—350)

This invention relates generally to catheters, and more particularly to improvements in catheters of the type which have a head portion adapted to be expanded in a body cavity to provide passageways for the drainage or for the application of medication.

The invention herein, while not specifically limited thereto, relates to catheters of the type having an expandible head designed to hold the catheter in a body cavity which is to be flushed or drained. The catheters of the prior art have been characterized by a preformed mushroom like tip which is either split or provided with holes providing for the flow of fluid. Such devices are so made that the mushroom portion thereof is normally in its opened position while in the body cavity. In inserting the same, the mushroom is first collapsed by a stylette, generally in the form of a stiff wire, which is forced against the closed inner end of the catheter to stretch it longitudinally and thus collapse the mushroom. To remove the catheter, the stylette must again be inserted therein and the end thereof pushed against the closed end of the catheter tube. This operation has sometimes caused trauma in the patient, sometimes by the stylette pushing a hole in the end of the catheter or by the stylette being misguided, with the end thereof moving through an opening in the mushroom.

The catheter according to the present invention comprises an outer tube having one or more mushroom heads, and an inner tube slidable within the outer tube and serving both as a passage for fluids as well as a means for collapsing or extending the mushroom head. In some variant forms of the invention, the outer tube is provided with structure for limiting the contractive movement of the same, so as to fix the dimensions of the mushroom head and insure passage of the fluids.

With the foregoing considerations in mind, it is a principal object of this invention to provide an improved catheter characterized by a pair of inner and outer tubes which telescope with respect to each other for inserting and removing the catheter, and thus making unnecessary the use of a stylette.

Another object is to provide a catheter consisting of inner and outer tubes which are movable longitudinally with respect to each other for the insertion and removal of a catheter from a body cavity.

Yet another object is to provide a catheter consisting of inner and outer tubes which telescope with respect to each other, and which can be manipulated to aid in the breaking up of blood clots or fibrous tissues which might clog the catheter openings.

A yet further object comprehends the provision of a catheter having a plurality of mushroom heads, which can be accurately positioned within a body cavity for facilitating both drainage and the application of medication.

A still further object comprehends a provision of a catheter comprising inner and outer telescoping tubes which can be both rotated and moved longitudinally with respect to each other for the forming of a mushroom head on the catheter when in a body cavity.

Other objects and important features of the invention will be apparent from a study of the specification following taken with the drawing, which together describe and illustrate some preferred embodiments of the invention, and what are now considered to be the best mode of

2

practicing the principles thereof. Other embodiments of the invention may be suggested to those having the benefit of the teachings herein, and such other embodiments are intended to be reserved especially as they fall within the spirit and scope of the subjoined claims.

In the drawing:

FIG. 1 is a longitudinal sectional view through one embodiment of an improved catheter according to the present invention, the catheter being shown in its collapsed position for insertion into or removal from a body cavity;

FIG. 2 is a view similar to FIG. 1, but showing the catheter in its expanded or working position;

FIG. 3 is a transverse sectional view taken along the line 3—3 of FIG. 2, looking in the direction of the arrows;

FIG. 4 is an elevational view of another embodiment of a catheter having a pair of mushroom heads which are disposed longitudinally from each other;

FIG. 5 is a transverse sectional view taken along the line 5—5 of FIG. 4 looking in the direction of the arrows;

FIG. 6 is a side elevational view of a portion of the catheter seen in FIG. 4, to a reduced scale, and showing the same in a collapsed position for insertion into or withdrawal from a body cavity;

FIG. 7 is a fragmentary longitudinal sectional view showing other structure for securing the inner tube to the outer tube of the catheter seen in FIGS. 1 to 5 of the drawing; and

FIG. 8 is a view similar to FIG. 6, but showing another embodiment of a catheter according to the present invention.

Referring now particularly to FIGS. 1 to 3 of the drawing, one embodiment of the improved catheter according to the present invention is referred to by the reference numeral 10 and includes an elongated outer tube 11 and an elongated inner tube 12 adapted to move telescopically with respect to the outer tube 11. The tubes 11 and 12 are closed at their inner ends as at 13 and 14 and the inner tube is bonded at its closed end to the outer tube as at 16.

The outer tube 11 has a plurality of annular closely spaced flanges 17 thereon to facilitate the insertion of the tube 11 into a body cavity or the removal therefrom. The inner tube 12 is likewise provided with an annular flange 18 so that the inner tube 12 can be manipulated with respect to the outer tube 11. The inner tube 12 is connected to a length of flexible tubing 19, which in turn may be connected to a receptacle, not shown, for observing and measuring the body fluids, or to a suitable source of medicating fluid, not shown.

Both the tube 11 and the inner tube 12 are made of a suitable material compatible with body tissues, rubber and nylon being examples of such materials, and the tubes 11 and 12 are preferably formed of such or like materials having the property of yielding as required when being inserted into the body.

The outer tube 11 is provided with slots 21, which in the example shown are spaced 90° angularly from each other, and which alternate with longitudinally extending portions 22. The inner tube 12 has a detent 23 adapted to be engaged with a detent opening 24 when the catheter 10 is in its extended position for insertion into the body cavity. The inner tube 12 can be moved longitudinally with respect to the outer tube 11 so as to cause the detent 23 to engage with a detent opening 26, at which time those portions 22 of the outer tube 11 are extended to provide a plurality of wing-like extensions 27, providing passages 23 together with the slots 21 from outside the outer tube 11 to the inside thereof. The inner tube

3

12 has one or more radial passageways 29 adapted to form communication between the interior of the outer tube 11 and the interior of the tube 12. As seen particularly in FIG. 3, the radial passageways are substantially in alignment with the passageways 21 and 28.

The positioning of the detent openings 24 and 26 is such that when the technician or surgeon moves the detent 23 from the detent opening 24 to the detent opening 26 he is apprised of the fact that the wing like extensions 27 are in proper position.

Referring now to FIGS. 4, 5 and 6 of the drawing, there is shown another embodiment of the invention referred to generally by the reference numeral 30. This embodiment of the invention comprises an outer tube 31 and an inner tube 32 which is adapted to move telescopically with respect to the outer tube 31. As with the embodiment of FIGS. 1 to 3, the outer tube 31 and the inner tube 32 are closed at their inner ends and the inner tube 32 is bonded at its inner end to the outer tube 31.

The outer tube 31 has a plurality of closely spaced annular flanges 33 so that the catheter 30 can be readily inserted into or removed from a body cavity. The inner tube 32 is likewise provided with an annular flange 34 for manipulation of the inner tube 32 with respect to the outer tube 31. The inner tube 32 is connected to a length of flexible tubing 36, which as in the embodiment of FIGS. 1 to 3, may be connected to a receptacle for measuring the body fluids or to a suitable source of medicating fluid.

As with the embodiment of FIGS. 1 to 3, the outer and inner tubes 31 and 32 are made of material compatible with body tissues such as rubber and nylon, and such materials preferably have the property of necessary yielding when being inserted into a body cavity.

In this embodiment of the invention, catheter 30 is provided with a plurality of longitudinally spaced wing-like extensions indicated generally by the reference numerals 37 and 38. These are respectively formed by slitting the outer tube 31 longitudinally with slots 39 which are spaced at 90° from each other, as seen more particularly in FIG. 5. However, and as seen in FIG. 6, two of such slots spaced 180° apart are provided with stop elements 41 which may be of a different or more stiff material and of a length approximately one-half that of the slots to provide a means for limiting the extent of outward movement of the wing-like extensions 37 and 38, these stops being also shown in FIG. 5. Upon contraction of the outer tube 31 and the extension of the wing-like members 37 and 38 the stops 41 move into abutting engagement with the end of the slot 39 as seen in FIG. 4. This prevents inadvertent movement of the inner and outer tubes, longitudinally relative to each other, so as to collapse the wing-like extensions end to end and thus close off the desired openings between them. The stops may be secured to the outer tube, at one end of the respective slots, by any suitable means.

The wing-like extensions 37 and 38 from the outer tube 31 provide a plurality of passageways 42 from without the tube 31 to the interior thereof.

Structure is provided for indicating to the technician the condition where the wing-like extensions in both heads are in their fully extended position, and to this end the inner tube 32 carries a detent 43 which moves from a detent opening 44 to a detent opening 46 when the outer tube 31 is contracted. The detent 43 extends radially from the inner tube 32 as with the embodiment seen in FIGS. 1 and 2.

As with the embodiment of FIGS. 1 and 2, the inner tube 32 has radial openings, not shown, which are arranged to be positioned adjacent the wing-like extensions 37 and 38 when the outer tube 31 is moved to its contracted position, these radial passageways in the inner tube 32 affording communication from without the tube 31 to within the tube 32 for drainage or medication.

4

Referring now to FIG. 7 of the drawing, there is shown an alternate structure for connecting the ends of an inner tube 47 to an outer tube 48. The inner end of the inner tube 47 has a shank 49 extending therefrom which is preferably molded integrally with a button type head 51, the shank 49 and the button 51 adapted to be forced through an appropriate opening 52 at the inner end of the outer tube 48. With this construction the inner tube may be rotated relative to the outer tube while the wing-like extensions are expanded so as to break up clots or other matter that might lodge in the openings between the tubes.

Referring now to FIG. 8, there is shown still another embodiment of the invention comprising an outer tube 53 and an inner tube 54. As with the embodiment of FIG. 7, there is shown spaced wing-like extensions 56 and 57 which can move into the extended position as seen in FIG. 4. The inner end of the inner tube 54 is fixedly bonded to the inside of the inner end of the outer tube 53 as at 58, so as to be integral therewith.

In this embodiment of the invention slots 59 are formed in the outer tube 53, these slots being arranged helically along the outer tube 53, preferably at an angle of about 45°. Two of the slots 59 spaced 180° apart have stop members 61 therein which enable the wing-like extensions 56 and 57 to adopt the known and positive position by engagement of the end of the stops 61 with the end of their respective slots 59.

In this embodiment of the invention, the extension of the wings 56 and 57 to positions as seen in FIGS. 3 and 5 is achieved by rotating the inner tube 54 with respect to the outer tube 53 in a direction opposite the inclination of the slots toward the inner end of the catheter. It should be noted that the material of the stop members is somewhat more firm than the material of the outer tube 53, so that upon such rotation the stop 61 will slide in the slots 59 and upon abutment with the ends thereof, limit the extension of the wings 56 and 57. This arrangement makes it possible for the technician to effect the expanded position of the catheter without the necessity to move the inner tube 54 with a purely longitudinally translative movement. This makes it possible for the technician to place the catheter in the body opening and, while firmly holding the outer tube 53 stationary, merely rotate the inner tube 54 to expand or contract the mushroom head. This insures that the outer tube 53 is not displaced in the body cavity.

It will be seen from the foregoing description that there has been provided a number of new and useful improvements in catheters having a retention head of the Malecot type. In the several embodiments shown, it is unnecessary to use a stylette for inserting the catheter and for using the stylette to collapse the retention head when the catheter is to be removed. In certain of the embodiments of the invention, the extension of the catheter to its correct position is done with the assurance that full flow will be had through the same by reason of the stops described, which prevent the wing-like extensions from closing end to end so as to stop the flow of fluid from without the catheter to the interior thereof.

In another embodiment of the invention, the expansion and contraction of the catheter head is achieved by merely rotating the inner tube with respect to the outer tube.

It may be noted also that the inner tube in the several forms of the invention may be manipulated as required to break-up or dislodge blood clots or fatty tissues which would ordinarily impede the flow of fluid.

Particular advantages of this invention reside in the fact that it may be made in any size to suit a wide variety of uses for which, at the present time, many special types must be provided. Thus a single instrument will take the place of several and particularly those requiring additional facilities which must be separately sterilized before use. Also the improved catheter, being made of suitable plastic material, is a disposable one time use device thereby saving labor in cleaning. Further advantages reside in the

5

adaptability of the improved device for use in peritoneal dialysis, for use as a retention catheter in urethral strictures and prostatic hypertrophy, for use in care of bladder tumors and hematuria with blood clotting, and for use in many cases where continuous drainage from the peritoneal cavity is desired.

Although several embodiments of this invention have been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A catheter comprising an elongate flexible outer tubular member having a closed end and including a plurality of angularly spaced wing portions adjacent said closed end which when arched radially outward define a mushroom-like retention head, a flexible tubular inner member extending longitudinally into said outer member and having a closed inner end secured to the closed inner end of the outer member, said inner member having a plurality of side wall openings opposite the wing portions of said outer member, and means for shifting said inner member longitudinally relative to said outer member lengthwise from its closed end to project and retract said wing members radially relative to the wall of said outer member.

2. In a catheter, an elongate flexible outer tube having a closed end and including angularly spaced wing portions adjacent the closed end adapted to be arched radially outwardly from the wall of said outer tube upon longitudinal contraction of said outer tube, a flexible inner tube of greater length than the outer tube secured to said outer tube at the closed end thereof and adapted upon movement relative to the outer tube to cause endwise contraction of the outer tube and project said wing portions radially from said outer tube, said wing portions when so projected defining passageways between them leading to the interior of said outer tube, and at least one opening in the wall of said inner tube in communication with said passageways.

3. In a catheter, an outer tube having a closed end and including a plurality of angularly spaced side wall slots adjacent the closed end defining wing portions adapted to arch outwardly from the wall of said outer tube upon endwise contraction of said outer tube, an inner tube secured to said outer tube at the closed end thereof and adapted upon longitudinal movement relative to said outer tube to cause endwise extension and contraction of the outer tube for flattening and arching said wing portions relative to the wall of said outer tube, said wing portions when outwardly arched defining passageways to the interior of said outer tube, at least one opening in the wall of said inner tube located for direct communication with said passageways, and a member movable in one of said outer tube slots for controlling the movement of said inner tube relative to the outer tube to insure proper arching of said wing portions upon endwise contraction of said outer tube.

4. A catheter comprising an outer tube having a closed

6

end and including a plurality of angularly spaced side wall slots adjacent the closed end defining axially extending wing portions, said wing portions being adapted to arch outwardly from the wall of said outer tube upon endwise contraction of said outer tube, an inner member secured fast to said outer tube at the closed end thereof and adapted upon movement relative thereto to extend and contract the outer tube axially and cause said wing portions to flatten and arch radially with respect to the outer tube side wall, said wing portions when arched defining passageways to the interior of said outer tube, at least one of said slots extending helically along said outer tube, and a stop member movable in said one slot to engage an end thereof for controlling the relative movement of said inner member and to insure proper arching of said wing portions.

5. A catheter comprising an outer tube having a closed end and including a plurality of angularly spaced helically extending side wall slots defining axially extending wing portions, said wing portions being adapted to arch outwardly from the wall of said outer tube upon endwise contraction of said outer tube, an inner member secured fast to said outer tube at the closed end thereof and adapted upon rotative movement relative thereto to cause said wing portions to flatten and arch radially with respect to the outer tube side wall, said wing portions when arched defining passageways between them leading to the interior of said outer tube, and a stop member movable in one of said slots to engage an end thereof for controlling the relative movement of said inner member and to insure proper arching of said wing portions upon endwise contraction of the outer tube.

6. A catheter comprising an elongate outer tube of flexible material having a closed end and including a plurality of angularly spaced side wall slots defining axially extending wing portions, said wing portions being located adjacent the closed end of said outer tube and adapted to arch radially outward from the wall of said outer tube upon endwise contraction of said outer tube, a flexible tubular inner member disposed within the outer tube and secured to said outer tube at the closed end thereof and movable longitudinally relative to said outer tube for contracting and extending the outer tube in the lengthwise direction to arch and retract said wing portions respectively, said wing portions when arched defining passageways between them leading to the interior of said outer tube, said inner member having a plurality of side wall openings disposed opposite said wing portion of the outer tube.

References Cited in the file of this patent

UNITED STATES PATENTS

1,719,428	Friedman	July 2, 1929
1,863,057	Innes	June 14, 1932
2,556,783	Wallace	June 12, 1951

FOREIGN PATENTS

726,041	France	Feb. 23, 1932
---------	--------	---------------

60