

[72] Inventor **Milton J. Cohen**
5437 Connecticut Ave., Washington, D.C.
20015

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2,452,813	11/1948	Wade	128/275
2,541,691	2/1951	Eicher	27/24
2,896,614	7/1959	Schmitt et al.	128/131
3,490,456	1/1970	Kortum	128/348
3,503,400	3/1970	Osthagen et al.	128/349
3,507,274	4/1970	Soichet	128/130

FOREIGN PATENTS

392,687	12/1908	France	128/348
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Primary Examiner—Dalton L. Truluck
Attorney—McDougall, Hersh, Scott & Ladd

[54] **CATHETER**
1 Claim, 4 Drawing Figs.

[52] U.S. Cl. **128/349,**
128/244

[51] Int. Cl. **A61m 25/00**

[50] Field of Search **128/348-**
—351, 343, 239—245, 248, 251, 130, 131

[56] **References Cited**
UNITED STATES PATENTS

724,913	4/1903	Montgomery	128/245
1,982,001	11/1934	Haas	128/130

ABSTRACT: This application discloses a catheter which comprises a hollow tube having a plurality of extensions at one end which are normally urged, by springs or other force exerting means, outwardly of the tube so that after the catheter has passed through a body passage or canal, with the end carrying the extensions entering first, when the extensions enter a body cavity the extensions will bend outwardly engaging the walls of the cavity adjacent the passage to retain the catheter therein so that fluid may be drained from the cavity.

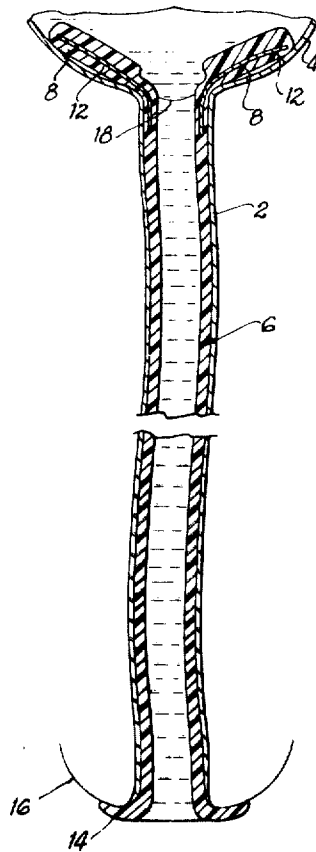


FIG. 1

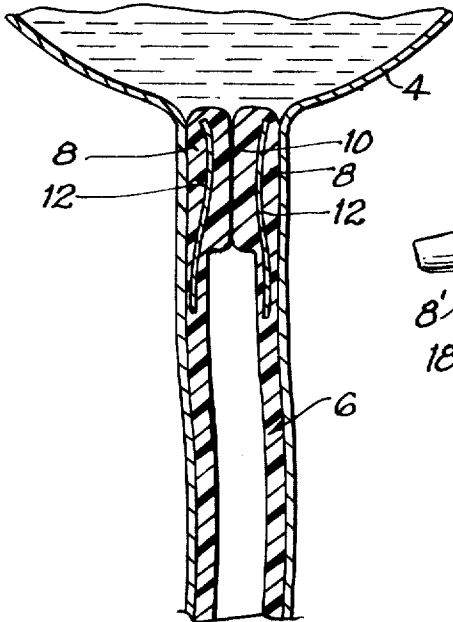


FIG. 2

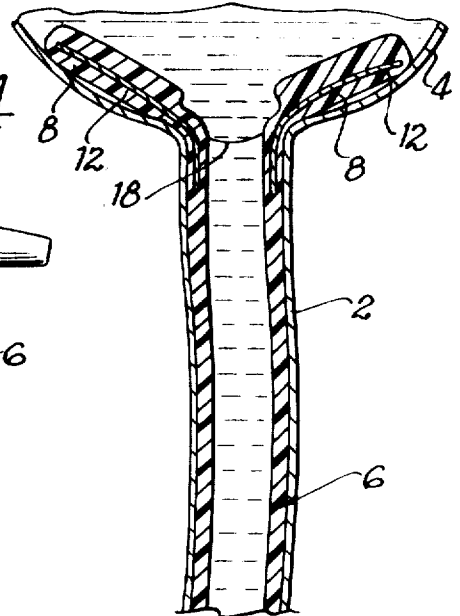


FIG. 4

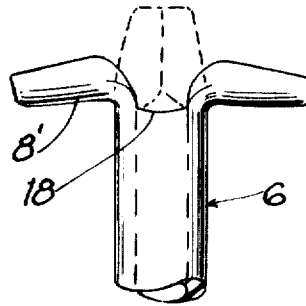
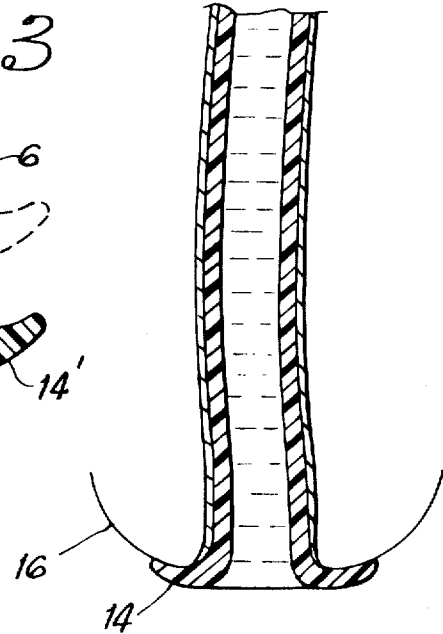
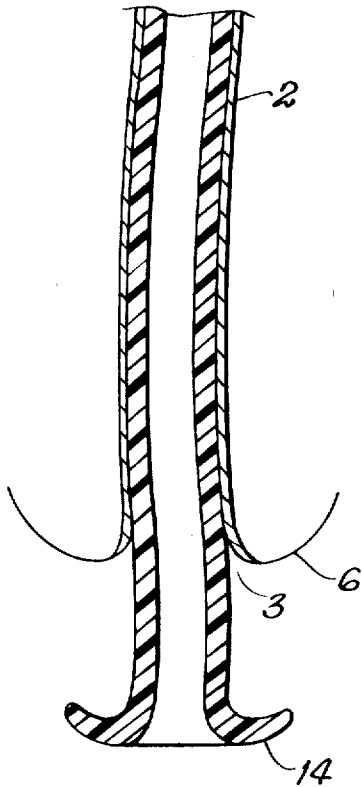
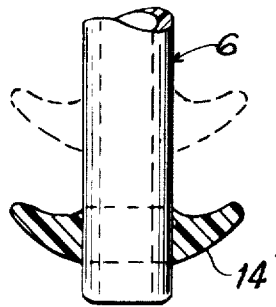


FIG. 3



INVENTOR
Milton J. Cohen
by McDougall Hersh, Scott
and Gladd Attys

CATHETER

BACKGROUND OF THE INVENTION

This invention relates to the catheters for draining fluids from body cavities. More specifically, it relates to improvements in the means for retaining such catheters in the body to provide a passage therefrom while it is desirable or necessary to drain the fluid trapped therein.

Catheters are used during medical and surgical procedures to drain fluid or fluids which may be trapped in a body cavity due to an organ malfunction, blockage of a passage to the outside of the body or when caused by infection or other disorders. Quite commonly, one of these situations occurs in connection with disorders of the genital-urinary system and requires that the contents of the bladder be drained. This is done by passing the catheter through the urethra to the bladder.

Heretofore, a most common catheter used for this purpose is one composed of a length of rubber tubing having two passages therethrough. The larger of these passages is used for the evacuation of the trapped fluid such as urine. The small passage is used for the passage of sterile water into an inflatable area at the end of the catheter which has been inserted into the bladder. A deformable valve is provided at the end of the catheter protruding from the urethra into which is inserted a syringe filled with the sterile water to be inserted into the inflatable area. The inflatable area balloons upon the insertion of the water and being larger than the urethral opening it prevents the catheter from slipping out.

This kind of device has several disadvantages, first it is relatively complicated and expensive to manufacture and second since the opening of the catheter is above the inflated area the fluid in the cavity cannot be completely evacuated. Since the desire is to empty the cavity completely in many cases, as for instance, the case of urine in bladders, it is necessary to resort to manual compression on the external area around the cavity. Further, such devices have been known to cause internal irritation which can be at least uncomfortable, if not harmful. Another problem of the prior art catheters is that infrequently many patients, such as the elderly, the senile, etc., sometimes, because of the discomfort they experience, will actually pull the catheter out. In so doing, they will do damage to themselves by dragging through the body passage the rubber sphere containing water.

Therefore, it is an object of this invention to provide a novel catheter which is simple in construction and relatively inexpensive to produce and sell.

It is another object of this invention to provide a novel catheter which can be inserted through a body passage into a body cavity in a simple manner without the need for several steps of manipulation.

It is another object of this invention to provide a novel catheter which may be inserted into a body cavity and can be retained therein with less possibility of internal irritation than those previously available.

It is still another object of this invention to provide a novel catheter which, if withdrawn because of patient discomfort, will not cause any serious irritation or damage to the patient.

Briefly, these and other objects are achieved in one embodiment of the invention by the provision of a hollow tube provided with portions at one end thereof which tend to assume positions outwardly angled to the longitudinal axis of the tube to retain the tube in a canal extending from a body cavity but which may be positioned coextensive with that axis to permit their passage and the passage of the tube through the canal into the cavity.

The invention itself is particularly pointed out and distinctly claimed in the concluding portion of this specification. Embodiments of the invention both as to their organization and method of use together with further objects and advantages may best be understood by reference to the following description taken in connection with the accompanying drawing in which:

FIG. 1 is a cross-sectional illustration of a catheter in accordance with the invention being inserted into a body passage toward a cavity at the end thereof;

FIG. 2 is a cross-sectional view similar to FIG. 1 wherein the catheter has been completely inserted and is in position;

FIG. 3 is a cross-sectional illustration of an alternative embodiment of one portion of the invention; and

FIG. 4 is a cross-sectional illustration of an alternative embodiment of another portion of the invention.

In FIG. 1, an embodiment of the invention is illustrated in the process of being inserted through a body passage leading a body cavity from which it is desired to drain trapped fluid. The representation in this drawing is that of the urethra leading to the bladder in male body. Obviously, by varying the dimensions of a catheter in accordance with the invention it can be designed for use in different situations, as for example, female bodies and canals and cavities other than illustrated. In this figure, the lining of the urethra, represented by the cross-hatched portion 2, terminates in the bladder 4. In a number of disorders it is not uncommon for urine to be trapped in the bladder and in this situation it is desired to drain the fluid in order to provide relief for the patient and as a therapeutic measure.

In accordance with the invention there is provided a catheter 6 constituted by a hollow flexible tube. The tube may be formed from any flexible material which is inert when inserted into the body, that is, it does not react with body fluids so as to liberate harmful substances into the body or be subject to deterioration by the action of body fluids. Such materials may be natural and artificial rubbers, plastics or even thin walled metal tubes formed from such metals as stainless steel. At one end of the tube a plurality of bendable portions or separable ends 8 are provided. In the embodiment illustrated, two such portions are shown, but this can be varied by a designer using as criteria such factors as the conformation of the cavity to be drained and the passage leading to it. The portions 8 are formed as extensions beyond the end of the flexible tube. In FIG. 1 these extensions are illustrated as being coextensive with the longitudinal axis of the tube so as to facilitate their entry and travel through a body passage 3. In this figure, the portions 8 are provided with confronting surfaces 10 which engage each other during the travel of the tube through the passage 3. In a normal position, that is, prior to the entry of the tube into the passage 3 and after the tube has been inserted a sufficient distance to permit the portions 8 to enter into the cavity constituted by the bladder 4, these portions extend outwardly at an angle to the longitudinal axis of the tube. This normal position is achieved in this embodiment by providing spring elements 12 in the portions 8 which are curved in such a way as to exert a force outwardly of the longitudinal axis of the tube. When restrained by a user or by the walls of the passage 3, they assume the position illustrated in FIG. 1.

Provided at the other end of the catheter is a circular flange 14 which functions as a means to limit the insertion of the catheter into the body engaging with an anatomical surface around the body exit of the passage. Thus, as the catheter is inserted, the flange 14 will engage an outer surface of the body through which the body passage 3 exits to the exterior of the body. As shown in this figure, such an outer surface is constituted by the end of a penis 16.

Referring to FIG. 2, it may be seen that the catheter has entered through the urethra so that the extensions 8 are disposed within the bladder and have assumed their normal position by virtue of the outward force exerted by the spring elements 12. At the same time the flange 14 has engaged the end 16 so that the insertion of the catheter has been limited and the portions 8 lie within and against the lower wall of the bladder 4. In this position an inner opening 18 of the catheter is provided and is in direct contact with the fluid contained within the bladder so that the fluid may drain therefrom to the outside of the body.

In FIG. 3, a flange or guard 14' instead of being formed integrally with the tube is formed as a separate element retained on the outer periphery of the tube by virtue of a frictional fit

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therewith so that it may be moved along the length of the tube as shown by the dotted line illustration in order to adjust the stock to accommodate body passages of varying length.

In FIG. 4 extensions or separable ends 8' instead of having springs 12 provided therein to exert an outward force to cause them to assume a position at an angle to the longitudinal axis of the tube are formed during the fabricating process so as to normally assume such a position. This can be accomplished by providing a mold for use in fabricating the catheter out of a moldable material which has a configuration at its one end conforming to the shape of this embodiment of the catheter.

In use the catheter is inserted into a body passage such as the urethra and positioned upwardly until the guard 14' contacts the outer end of the passage opening. When this occurs, there is a simultaneous emerging of the separable ends 8' into the lower area of a body cavity such as the bladder. The separable ends immediately diverge due to the action of the outward force applying means and lie with a slight pressure against the inner wall of the cavity. This separation allows the opening of the upper end of the catheter to be in direct contact with the cavity contents at the lowest point in the cavity so that complete evacuation of the body hood is achieved. When

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it is desired to remove the catheter, the user merely grasps its outer exposed end and gently pulls so that the separable ends within the cavity come together, thus releasing their internal retaining force so that the catheter may be removed.

It will be understood that changes may be made in the details of construction, arrangement and operation without departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. A catheter comprising a hollow tube formed from a flexible material, said tube having a cylindrical portion surrounding a passage and a pair of portions at one end thereof movable from a position where they contact each other and are coextensive with the longitudinal axis of said tube to a position where they extend at an angle to that axis, each portion having a spring element embedded therein, each spring element extending a short distance into opposite sides of the cylindrical portion of said tube and each spring element being curved so as to exert a force outwardly of the longitudinal axis of said tube so as to cause said pair of portions to move to the position where they extend at an angle to the axis of said tube.

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