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BULBOUS URINARY CATHETER WITH AXIAL EXTENSION MEANS

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Fig. 1.

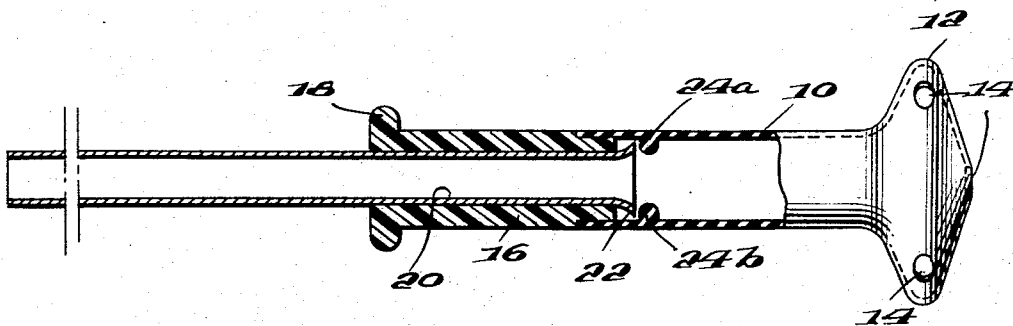
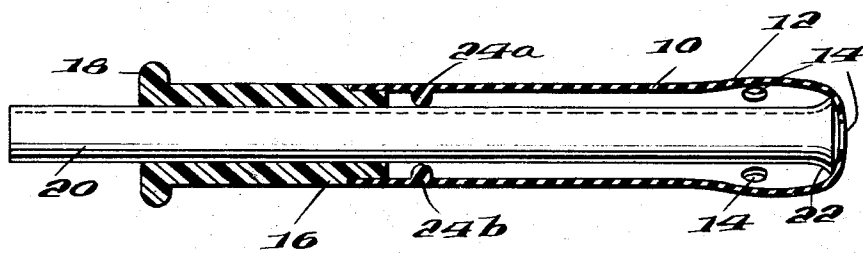


Fig. 2.



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**BULBOUS URINARY CATHETER WITH AXIAL
EXTENSION MEANS****John W. Foderick, 217 Board of Trade Bldg.,
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This invention relates to improvements in urethral catheters, and more particularly to an improved urethral catheter of the indwelling or self-retaining type, sometimes referred to in the literature as the pezzet head catheter.

Known catheters of this type are open to the objection that they require separate means for their introduction into and through the body cavities and/or passages leading to and thence into the urethra, and similarly for their removal following an operational period. Furthermore, such means usually take the form of a stiff, sometimes pointed, mandrel or rod which, after being pushed through the tubular drain passage of the catheter body or stem, must be engaged against the inside wall of the pezzet head with enough force to extend same. If accidentally pushed completely through said wall, not only must the catheter be replaced but there is also the possibility of injury to the urethra should such a rupture occur preliminary to removal of the catheter after it has been operational.

Stated broadly, an object of the invention is to provide an indwelling or self-retaining type of urethral catheter incorporating effective, thoroughly dependable and patient-safe operating means of an inbuilt character, that is, forming an operational part of the catheter.

More particularly, it is an object of the invention to provide a catheter of the so-called pezzet-head type with means forming an operational part thereof, i.e., a canula or drain tube, for effecting extension and thereby radial contraction of the pezzet head, as is required for its introduction into and removal from the female urethra, for example.

Another object of the invention is the provision of a self-retaining type of urethral catheter incorporating inbuilt operating means therefor which is so constructed and arranged as to greatly facilitate the introduction and removal of the catheter proper from the urethra and which provides an effective drainage adjunct of the catheter during operational period thereof.

The above and other objects of the invention will appear from the following description taken with the accompanying drawing illustrative of a preferred physical embodiment of the improved catheter forming the subject thereof, in which

FIG. 1 is a part-sectional side elevation of an indwelling or self-retaining urethral catheter incorporating built-in operating means according to the invention; and FIG. 2 is a full longitudinal section taken through said catheter and its inbuilt operating means, showing the action of said inbuilt operating means in axially extending the normally expanded pezzet head as is required for its introduction into and removal from the urethra.

Referring to the drawings in greater detail, the catheter proper comprises a flexible rubber sleeve 10 constituting the stem or body portion thereof and being connected at its distal end to a normally radially enlarged, bulbous shaped head or tip 12 sometimes referred to in the literature as a pezzet head (a term apparently deriving from the patent to De Pezzet No. 504,424, dated Sept. 5, 1893) and which is made of flexible rubber having memory qualities as insures said head always returning to its unstressed, radially enlarged shape following its axial extension which is required for its introduc-

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tion into and removal from the urethra. As conventional, said head is fenestrated to provide a plurality of drainage openings 14 through which a liquid may pass into the tubular sleeve for drainage therethrough.

According to the invention, the tubular rubber sleeve 10 is connected at its proximal end to a relatively stiff plastic collar 16 preferably having the same external diameter as that of said sleeve, and which is provided at its proximal end with a radially projecting flange 18. Closely fitted to the bore of said collar and being slidable axially therethrough is a stiff plastic tube 20 having appreciably greater length than the combined length of said flexible sleeve 10 constituting the catheter proper and the plastic collar 16 to which it is connected, whereby when said plastic tube is projected into said flexible sleeve the amount required for it to extend the bulbous head or tip 12 (FIG. 2), a short length portion of said tube will project from the proximal end of the collar.

It is a special feature of the invention that the distal end of the stiff plastic tube 20 is outwardly flared as at 22, such resulting in the external diameter of said end being appreciably greater than that of the major length portion of said tube, although still less than the internal diameter of the tubular sleeve or stem portion 10. Such arrangement provides that once the tube is assembled within the collar 16, it cannot be pulled axially therefrom. Instead, pull on the tube in separating direction results in its moving axially to a retracted position (FIG. 1) in which its flared distal end 22 seals tightly against the distal (inner) end of said collar. When the tube 20 is in this position, to which it is normally pulled after the bulbous head or tip 12 of the catheter has been introduced into the urethra, the plastic tube acts as an extension of the tubular stem 10 of the catheter through which liquid may drain from the latter, with assurance that no liquid will leak out through the annular clearance space between the collar 16 and the tube.

The flared end 22 of said tube also assists in normally maintaining the tube in its retracted position. More particularly, the tubular sleeve 10 forming the stem of the catheter proper is provided with a plurality, i.e., two or three, inwardly projecting soft rubber bosses 24a, 24b, etc., disposed in circumferentially spaced relation on a circle of the sleeve which is spaced from the distal end of said collar 16 in the direction of the catheter head 12 a distance slightly greater than the axial length of the flared end portion 22 of the plastic tube. Thus, as seen in FIG. 1, said bosses will effect some radial contraction of the flared end of the tube as it is pulled outward to its tube-to-collar sealing position, but upon passing the bosses, said flared end will snap back to its normal diameter behind (proximally of) said bosses. Thereupon the bosses serve to hold the tube against unintentional or accidental dislodgement as could allow its uncontrolled movement into the catheter. However, rather than acting as rigid stop abutments, said bosses 24a, 24b will yield sufficiently when pressed against by said flared end 22 as permits the tube to be intentionally moved axially into the catheter proper.

Should manufacturing techniques require it, a continuous internal bead of soft rubber may be substituted for the plurality of internally projecting bosses 24a, 24b, etc., without departing from the scope and spirit of the invention.

While it is believed that the mode of rendering a urethral catheter according to the invention operational will be clear to those skilled in the art from the foregoing description, such will be briefly summarized as follows: Normally, the plastic tube 20 is in the retracted position in which it is shown in FIG. 1, the flared end 22 of the plastic tube being snug against the distal end edge of the collar 16, and the tube being restrained against accidental

dislodgement in inward direction by the inwardly projecting bosses 24a, 24b, etc., provided on the catheter sleeve or body member 10. When it is desired to introduce the catheter, the plastic collar 16 may be grasped between the fore and middle fingers, with the integral radially projecting flange 18 assisting such finger action, and thereupon the plastic tube 16 is moved forwardly (distally) of the collar by pressure applied to its outer end.

When the flared end 22 of the tube clears the bosses 24a, 24b, etc., it moves more or less freely through the tubular sleeve 10 until it engages against the inner wall surface of the bulbous shaped head or tip 12. Continuous pressure on the outer end of the plastic tube then proceeds to extend said head or tip axially, as results in its radial dimension being substantially reduced, as in FIG. 2. The head end of the catheter is then introduced into and through the body passages or cavities leading to the urethra until finally the extended head end thereof reaches a desired position within the latter. Thereupon, the plastic tube 20 is retracted until its flared end 22, after passing the inwardly projecting bosses 24a, 24b, etc., reaches its endmost position of retraction in which said flared end seals against the distal end of the collar 16. Incident to the initial portion of this retracting movement, the plastic tube moves away from the internal wall of the then extended catheter head 12, whereupon the latter distends to its unstressed (bulbous) state and upon reaching same, said head then functions both as a means to retain the catheter within the urethra, just as does the retention collar of the conventional Foley-type catheter when distended to render it operational, and as a means for permitting passage of liquid from the urethra or bladder to the tubular passage which the catheter provides for drainage therethrough.

When removal of the catheter is in order, the plastic tube 20 is again pushed forwardly through the sleeve 16 so as to axially extend the bulbous catheter head 12, and when such has been effected, the catheter and plastic tube may be removed in unison.

Without further analysis, it will be appreciated that a catheter according to the present invention is of advantage as compared to the conventional Foley catheter in eliminating the additional accessories such as sterile needle and syringe which most Foley catheters require in their use; in eliminating the inflating or retention collar which is an integral adjunct of the Foley catheter; in providing a self-automated and compact unit which for female use need have length only about a third the length of the standard Foley catheter, thereby conserving material and reducing the cost of the device to the patient; in eliminating the problem of possible accidental rupture of the distal retention collar as often occurs in the use of the conventional Foley-type catheter; and finally in resulting in a much lighter catheter than the Foley catheter and thus one that causes lesser traction on the bladder and urethra and thereby adds to patient comfort.

And as compared to the known so-called pezzier-head catheters, the catheter of the invention has the advantage of incorporating a built-in operating means completely lacking in the prior catheters of this type; of providing a self-sealing drain tube-form operating means of a highly sanitary nature; of providing a built-in retractible tube for effecting axial extension of the normally bulbous shaped retention head and latching means therefor which is capable of effectively restraining said tube in its retracted position, thereby insuring against accidental or unintentional movement of the tube into the distal catheter head when the catheter is inserted and operational and finally in providing operating, i.e. head extending, means which is so constructed and shaped as to do away

with the danger of rupture of the self-retaining catheter head as it is being axially extended.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrated and not in a limiting sense.

I claim:

1. A catheter comprising, in combination: a catheter proper including a tubular sleeve of flexible material having a radially enlarged, normally bulbous shaped retaining head at its distal end and which is radially contractible with axial extension thereof from within, and said head being provided with drainage openings, a tubular collar of relatively stiff material coaxial with said sleeve and to which the proximal end thereof is connected, and a tube slidably received in said collar and having length as to effect axial extension of said retaining head responsive to its distal end being moved axially against the same from within by axial push force applied to the proximal end of said tube, and coacting means on said sleeve and tube, respectively, for releasably securing the latter in a normally retracted position within the collar and in which its distal end makes sealing engagement with the corresponding end of said collar, the bore of the tube when the latter is in said retracted position providing a drain passage for liquid entering the sleeve through its head openings.
2. A catheter according to claim 1, wherein said last means includes a radial enlargement on the distal end of the tube of diameter such as prevents movement of said end axially through said collar.
3. A catheter according to claim 1, wherein said last means includes a flared end portion on the distal end of the tube, the maximum diameter of which is greater than the internal diameter of the collar.
4. A catheter according to claim 2, wherein said last means further includes yieldable abutment means projecting radially inwardly from said catheter sleeve and being located a small distance distally of said collar, said abutment means coacting with said radial enlargement of the tube upon said enlargement moving outwardly past same in preventing unintentional return movement of the tube into the catheter proper.
5. A catheter according to claim 3, wherein said last means further includes yieldable abutment means projecting radially inwardly from said catheter sleeve and being located a small distance distally of said collar, said abutment means coacting with the flared end portion of the tube, upon said end portion moving outwardly past same, in preventing unintentional return movement of said tube into the catheter proper.
6. A catheter according to claim 5, wherein said yieldable abutment means comprises a plurality of circumferentially spaced soft rubber bosses formed on and projecting radially inwardly from the inner wall of said catheter sleeve.

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