

[54] **CATHETER TUBE**

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128/350 R, 351, 246, 325, 344

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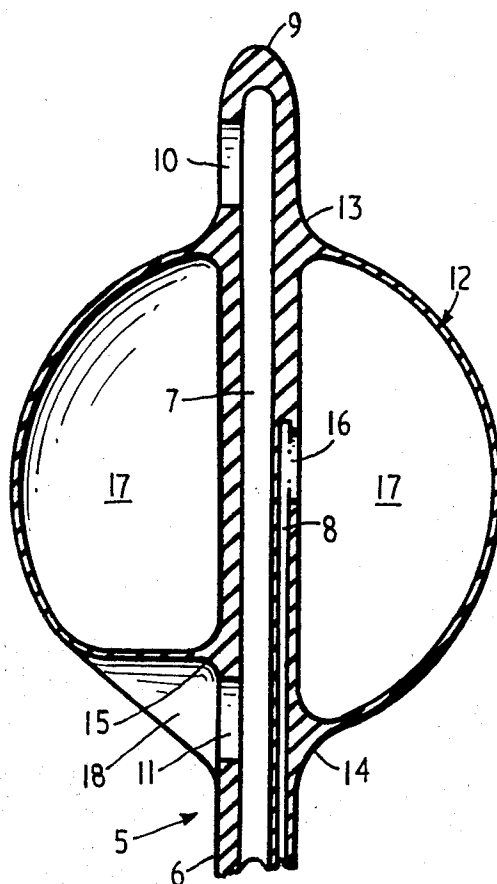
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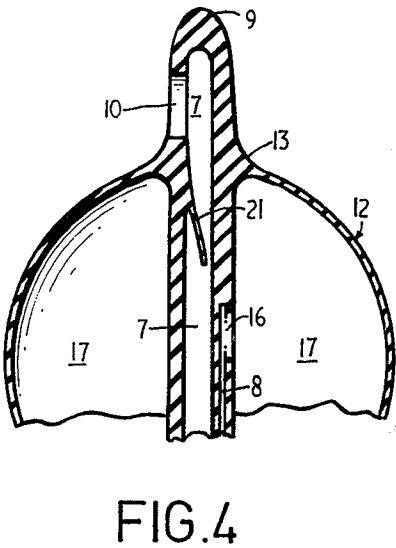
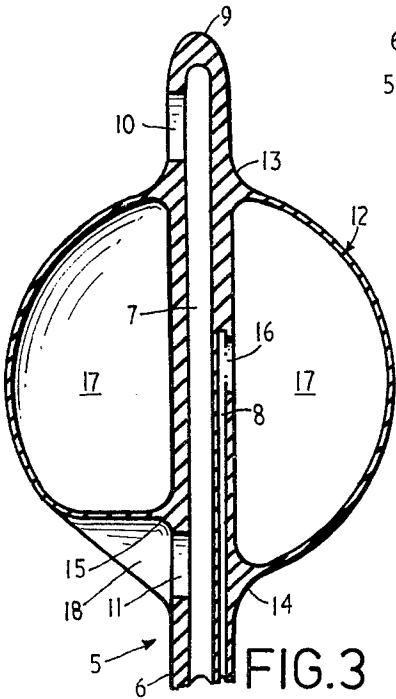
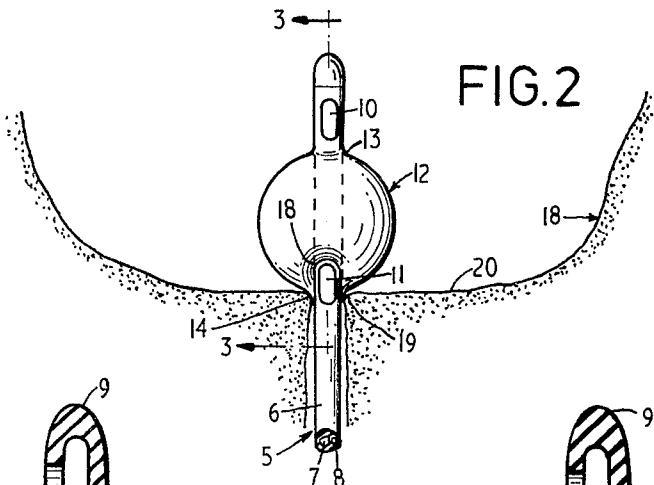
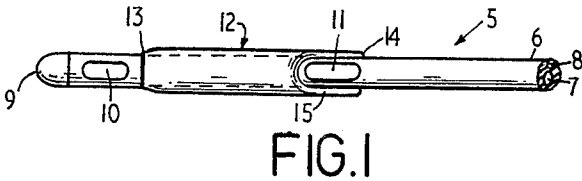
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ABSTRACT

A catheter having two bores in a main flexible tube. The first bore is for drainage of waste matter from the bladder and two apertures are provided, one adjacent the leading end of the catheter, the second being spaced from the first towards the following end of the catheter. Each of the apertures allows waste matter to drain from the bladder through the first bore. A thin tubular membrane is provided around the main tube of the catheter substantially in the region between the first and second apertures. The second bore communicates with the space between the membrane and the main tube via a further aperture in the main tube. Distilled water or the like may be introduced to this space through the second bore to expand the membrane so that the leading end of the catheter containing the two drainage apertures may be held in the bladder during use. Part of the thin tubular membrane is so arranged around the tube adjacent the second drainage aperture that a port is formed when the membrane is expanded whereby waste matter in the bladder in the vicinity of the junction of the bladder with the urethra may drain through the second aperture.

2 Claims, 4 Drawing Figures





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CATHETER TUBE

This invention relates to catheters.

Persons who are unable to control their bladders, such as paraplegics and quadriplegics, are fitted with catheters to drain urine and other waste matter from their bladders. Conventionally, such catheters comprise an extended flexible tube inserted through the urethra so that a small portion of the catheter extends into the bladder. In one form of known catheters the small portion extending into the bladder has an aperture adjacent the end thereof through which waste matter drains from the bladder through the flexible tube to a collection bag affixed to the end of the tube outside the body of the person concerned in the vicinity of the point where the flexible tube enters the body. Such conventional catheter is provided, adjacent the aperture and between the aperture and the junction of the urethra and the bladder when the catheter is in position, with a thin tubular membrane affixed around the said flexible tube. Within the tube there is provided a second bore, complementary to the bore through which waste matter drains from the bladder, this second bore communicating through a further aperture in the wall of the flexible tube with the space between the flexible tube and the thin tubular membrane so that the space between the flexible tube and the thin tubular membrane may be substantially filled with fluid such as distilled water whereby the thin tubular membrane is ballooned within the bladder. The ballooning of this thin tubular membrane prevents the end of the catheter wherein the draining aperture is provided from retracting from its position in the bladder. A major disadvantage of this known catheter is that fluids in the bladder tend to rest between the aperture and the junction of the bladder and the urethra and the ballooned thin tubular membrane prevents the drainage of these fluids through the aperture.

In order to overcome the disadvantage indicated above, it has been proposed to provide a second aperture in the wall of the flexible tube adjacent the thin tubular membrane but on the opposite side of this membrane from the first draining aperture. However, it has been found that this second aperture tends to locate in the urethra below the junction of the urethra and the bladder when the thin tubular membrane is ballooned so that provision of this second aperture does not overcome the difficulty referred to above.

It is an object of this invention to provide catheter means wherein a second aperture is provided as described above, said second aperture being located in the bladder adjacent the junction of the bladder and the urethra when the space between the thin tubular membrane and the flexible tube is ballooned, wherein the ballooned thin tubular membrane is arranged about the second aperture so that a port is provided through which port waste matter in the bladder adjacent the junction of the bladder and the urethra may pass into the second aperture thence into the first bore to be drained from the catheter.

It is a further object of this invention in a preferred form to provide a catheter as described wherein a non-return valve is provided in the first bore between the second and the first apertures so that cleaning fluid forced into the first bore may enter the bladder through the second aperture but is prevented by the non-return

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valve from entering that part of the first bore between the non-return valve and the first aperture.

It will be seen that waste matter in the bladder below the level of said first aperture will drain through the port into the first bore of the flexible tube and thence from the catheter into the collection bag provided at the end of the catheter.

Preferred forms of the invention are illustrated in the accompanying drawings in which:

FIG. 1 is a side elevation of the leading end of a first form of catheter tube in a suitable condition for insertion,

FIG. 2 is a side elevation of the catheter inserted into the bladder with the location balloon inflated to hold the catheter in place in the bladder,

FIG. 3 is an enlarged view in section on the line 3—3 in FIG. 2, and

FIG. 4 is a similar view to FIG. 3 of a second form of the catheter which incorporates a non-return valve.

The catheter 5 comprises a flexible tube 6 having two longitudinal bores 7 and 8 extending substantially throughout its length; the bore 7 being of larger diameter than the bore 8. The bore 7 extends to the closed leading end 9 of the tube 6, the said end 9 being rounded to assist insertion. A radial aperture 10 is provided in the tube wall adjacent its end 9, and a second similar aperture 11 is located a short distance down the tube 6 for a purpose to be described; both apertures communicate with the bore 7.

A thin tubular membrane 12 is positioned about the tube 6 between the apertures 10 and 11. The upper end 13 of the tube 12 is united as by welding with the wall of the tube 6. The lower end 14 of the membrane 12 extends below the aperture 11 but is cut away at 15 in U-shaped configuration about the periphery of said aperture 11. The end 14 and cut-away portion 15 of the tube 12 is joined to the wall of the tube 6.

The narrow bore 8 in the tube 6 extends to a medial termination between the apertures 10 and 11. A third aperture 16 extends radially, from the bore 8, into the space 17 between the bore of the tube 12, and the outer wall of the tube 6.

Fluid such as distilled water may be forced up the narrow bore 8 and into the space 17 just described. This will cause the membrane 12 to balloon out into a substantially spherical configuration. The cut-away portion 15 will form a port 18 in the region of the aperture 11.

In use the membrane 12 is deflated so that it closely engages the tube 6 as shown in FIG. 1. The catheter 5 is then inserted so that its leading end 9 enters the bladder 18 with the membrane 12 fully within the bladder and with the aperture 11 adjacent the bladder entrance 19. The membrane 12 is then inflated to the spherical form as shown in FIGS. 2 and 3, so that the catheter will be retained within the bladder 18 with the membrane 12 substantially engaging the bladder entrance. The contents of the bladder can now be withdrawn through the apertures 10 and 11 and down the tube 6 via its larger bore 7. It will be seen that the bladder can be substantially emptied as fluid and solid deposits adjacent the bladder floor 20 can be drawn through the aperture 11 via the port 18 formed by the cut-away portion 15 of the ballooned membrane 12.

In a modified form of the catheter shown in FIG. 4 an integral flap 21 is formed within the bore 7 immediately below the aperture 10. With this form of catheter,

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cleaning fluid may be forced up the larger bore 7 to flush out the bladder 18. It will be seen that during this operation, the flap valve 21 will close the tube 7 so that all of the cleaning fluid will be forced to emerge from the lower aperture 11. This ensures the deposits on the bladder floor 20 will be dislodged. The cleaning fluid and entrained deposits can now be drained through the tube 6 as previously described.

Although this invention has been described in the specification and the claims, it will be obvious to a man skilled in the art that minor variations may be made without detracting from the merit of the invention. The specification and claims should be read so as to incorporate such minor variations.

What I claim is:

1. Catheter means comprising an extended flexible tube, said tube housing first and second longitudinal bore means, said first bore means extending for substantially the entire length of the catheter and terminating adjacent the leading end of the tube;
first and second aperture means in the tube communicating with said first bore means;
said first aperture means being located adjacent the leading end of said tube and said second aperture means being spaced from said first aperture means towards the following end of said tube;
thin tubular membrane means positioned around said tube substantially in the region of the tube between

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said first and said second aperture means and being affixed to an entirely surrounding said tube so that a junction between said membrane and said tube is not above said second aperture means except in the immediate area thereof where said junction is above said second aperture means;

said second bore means extending substantially throughout the length of said catheter;

further aperture means in said tube interconnecting said second bore means and the space between said tube and said thin tubular membrane means; and port means, through which waste matter may pass from a bladder into which that part of the catheter containing said first and said second aperture means is inserted through said second aperture means and into said first bore means, said port means positioned within the area around said second aperture at the said junctions of the membrane and tube and being formed in said thin tubular membrane means when the space between said thin tubular membrane means and said flexible tube is ballooned by the introduction of fluid into said space.

2. Catheter means as in claim 1 wherein a non-return valve is provided in the flexible tube between the second and first apertures.

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