

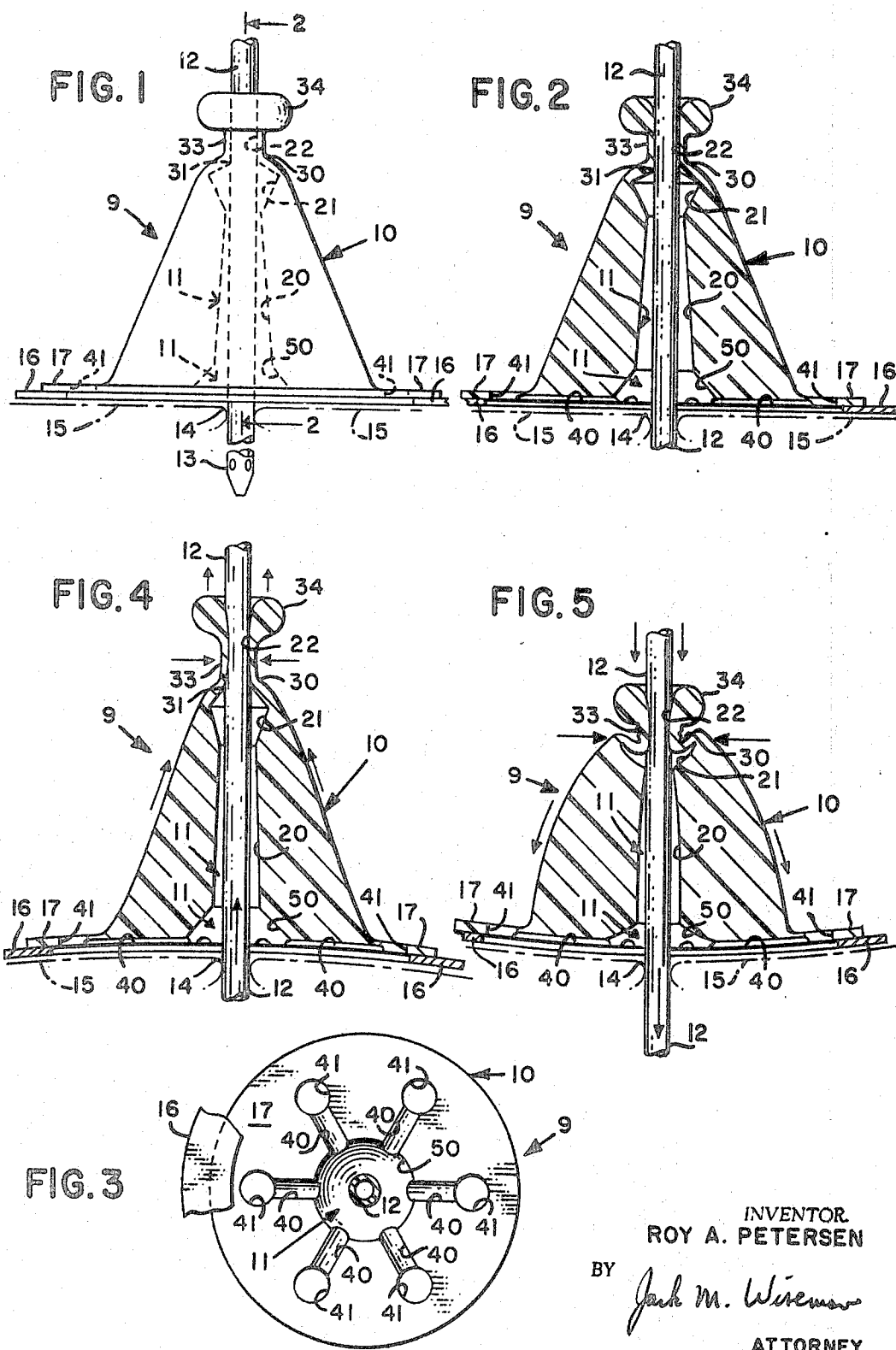
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DEVICE FOR HOLDING CATHETERS IN POSITION

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9 Claims

ABSTRACT OF THE DISCLOSURE

A device for retaining a catheter in position in which the catheter is frictionally gripped by a tapered axial hole in a bell-shaped elastic body. The elastic body has a narrow neck for forming a thin-walled sleeve about the catheter, and a cavity is formed in the hole inwardly of the sleeve. Any tendency of the catheter to move outward causes the sleeve to stretch and resist this movement and any tendency of the catheter to move inward causes the sleeve to buckle into the cavity and resist this movement. The device is attached to the skin at the flat bottom surface of the elastic body which is provided with grooves for draining liquid discharges from the skin.

The present invention relates to a simple and reliable device for holding a catheter in position.

When a catheter is placed into the urinary bladder, gall bladder, peritoneal cavity, bowel, chest, renal pelvis, or other body cavity, it is important that it remains in place without migrating either more deeply into the cavity or out of the cavity. At present, catheters are fastened in position either by suturing the catheter to the skin or by heavy application of adhesive tape. The sutures have a tendency to cut through the skin or other structures to which they are anchored, thereby losing hold of the catheter. Adhesive tape applied to a catheter becomes wet as a result of the discharge of body fluids onto the catheter, and thus also loses hold.

The present invention overcomes these disadvantages by the provision of an elastic catheter retaining device which effectively restrains movement of the catheter, and which may be reliably taped in place at the surface of the skin.

The various features and advantages of the present invention will become more apparent upon a consideration of the following descriptions taken in connection with the accompanying drawings, wherein:

FIGURE 1 is an elevational view of a catheter holding device embodying the present invention, which is shown holding a catheter in place at the surface of the skin;

FIGURE 2 is a cross-sectional view taken along the axis of the catheter holding device of FIGURE 1;

FIGURE 3 is a bottom view of the catheter holding device of FIGURE 1;

FIGURE 4 is a cross-sectional view taken along the axis of the catheter holding device of FIGURE 1, showing the resistance of said device to withdrawal of the catheter; and

FIGURE 5 is a cross-sectional view taken along the axis of the catheter holding device of FIGURE 1, showing the resistance of said device to insertion of the catheter.

The catheter holding device 9 of the present invention shown in the drawing comprises a bell-shaped elastic body 10 which may, for example, be molded from an elastomer, such as rubber or plastic, having elastic properties. The elastic body 10 has an axial opening or passageway 11 into which a catheter 12 extending through an opening 14 in the patient's skin 15 (shown in phantom) to a desired location for the drainage tip 13 in a body cavity of the patient. The catheter retaining device 9

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is attached to the skin 15 by means of a double-faced adhesive disc 16 between the skin and the outer edge of a flat anchor plate 17 which is formed at the bottom of the bell-shaped body 10. The adhesive disc 16 may be further affixed to the skin by strips of adhesive tape applied over the upper surface thereof and extending to the skin, or by suitable attached straps which encircle the body of the patient.

The opening 11 comprises a tapered conical hole 20 which opens into a wedge-shaped cavity 21 and then narrows down into a straight cylindrical hole 22. The junction of the hole 22 with the top of rounded surface 30 forms a radially-extending shoulder 31 at the projected apex of the conical opening. The upper portion of the body 10 is necked down at the cylindrical hole 22 to form a thin, uniform thickness, gripping sleeve 33 above the shoulder 31. The top of the flexible body 10 is thickened to form a rolled end 34.

As seen in FIGURE 3, the underside of the anchor plate 17 has radial grooves 40 formed therein, with a hole 41 through the plate at the end of each groove. Any serum, blood or other liquid discharged through the skin opening 14 will drain through the grooves 40 and holes 41 at the top of the plate 17 to thereby keep the adhesive disc 16 dry and firmly attached to both the locking piece 10 and the skin 15.

The conical hole 20 is tapered so that the walls of the hole and the shoulder 31 engage the inserted catheter 12 with sufficient friction, when dry, to prevent slippage of the catheter. However, the taper of the conical hole 20 is not sufficient, in itself, to prevent slippage when the catheter 12 is wet, as otherwise it would be exceedingly difficult to make the initial insertion of the catheter 12 into the body 10. The rolled end 34 of piece 10 also provides friction engagement with the inserted catheter 12.

In use, the holding device 9 restrains the catheter 12 against undesired displacement by elastic deformation as shown in FIGURES 4 and 5. If the catheter 12 tends to pull out of the body of a patient, the tubular elastic gripping sleeve 33 will stretch as shown in FIGURE 4, it being noted that thick rolled ends 34 and the thick shoulder 31 grip the catheter more tightly than the thin sleeve 33. As the elastic body 10 progressively stretches in length, it becomes progressively smaller in diameter and thus puts additional gripping friction on the catheter 12; and eventually the entire body 10 will stretch and the conical opening 20 will narrow and grip the catheter 12. If the catheter 12 tends to push further into the body of a patient, the catheter carries the friction-engaged rolled edge 34 along with it, thereby buckling the thin-walled sleeve 33 and bunching it inside the wedge-shaped cavity 21 as shown in FIGURE 5. As the sleeve 33 is carried progressively further into the cavity 21 it is progressively compressed against the catheter 12 to provide enhanced gripping friction. Thus, when the catheter 12 tends to move in either direction, the holding device 9 imposes additional gripping friction to halt the movement and maintain the catheter in its desired position inside the body of the patient.

The initial insertion of the holding device 9 onto the catheter 12 is made after the catheter is in the desired location inside the body of a patient. To accomplish this, finger pressure is used to counter the locking deformations described with reference to FIGURES 4 and 5. In particular, the outer end of the catheter 12 is advanced through the anchor plate 17 and the rolled edge 34 is pushed down towards the sleeve 33 to enable this end of the catheter 12 to move up through the opening 11 so that the anchor plate 17 may be placed against the skin 15. Once the plate 17 is in place, the catheter 12 may be inserted more deeply by pulling the rolled edge away from

the cavity 21 as the catheter 12 is pushed inward, or the catheter 12 may be withdrawn by pushing the rolled edge 34 down toward the cavity 21 as the catheter 12 is pulled outward.

In a typical embodiment designed for use with a 5 mm. diameter catheter tube 12, the hole 20, after an initial flare 50 (FIGURE 2), tapers in diameter from 5 mm. to 3 mm. over a distance of 12 mm.; the cavity 21 increases in diameter from 3 mm. to 6 mm. over a distance of 3 mm. and then decreases to a diameter of 2.5 mm. over a distance of 1 mm.; and the hole 22 continues at a diameter of 2.5 mm. and runs for a distance of 1 mm. through the shoulder 31, and then for an additional distance of 5 mm. through the sleeve 33, which is 0.5 mm. thick and 3 mm. long, and rolled end 34, which is 2.5 mm. thick and 2 mm. long.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A device for holding a catheter in place comprising: an elastic thin-walled sleeve adapted to have a catheter inserted therethrough and into a body cavity of a patient; a first thick elastic member at the outward end of said sleeve for gripping said catheter by friction; a second thick elastic member at the inward end of said sleeve for gripping said catheter by friction, any tendency of said catheter to be withdrawn from said body cavity of a patient causing said thin-walled sleeve to stretch and frictionally engage said catheter to halt said withdrawal; means associated with said second thick elastic member for forming a cavity surrounding said catheter inwardly of said sleeve, any tendency of said catheter to become further inserted into the body cavity of a patient causing said thin-walled sleeve to buckle and be inserted into said cavity to frictionally engage said catheter and halt said insertion, and an elastic body with a passageway therethrough, said passageway having said cavity formed therein, a portion of said body being narrowed down around said passageway to form said thin-walled sleeve with said thick elastic members at each end thereof.

2. A device according to claim 1 wherein said passageway is formed to provide a hole which tapers down from the inward end of said passageway to the inward end of said cavity for frictionally engaging said catheter.

3. A device according to claim 2 wherein a flat surface is formed at the inward end of said elastic piece, said flat surface being adapted to be fixed to the skin of a patient around that point at which said catheter enters the body of the patient.

4. A device according to claim 3 including passageways formed in said flat surface for draining fluid which discharges at the point at which said catheter enters the body of the patient.

5. A device for restraining the movement of a catheter comprising a body of soft elastomer material with a central passageway therein adapted for receiving the catheter, a portion of the wall of the passageway being adapted to grip the catheter, and an anchor member on said body in fixed relation therewith, said anchor member

being formed with an opening axially aligned with said passageway and adapted for receiving the catheter therethrough, said passageway being axially disposed relative to said body and being formed with a tapering wall for gripping the catheter inserted in said passageway, said tapered wall constricting said passageway in response to axial elongation of said body for gripping engagement with the catheter, said passageway also being formed with walls defining a wedged-shaped cavity means disposed adjacent the tapering wall for gripping the catheter inserted in said passageway, said wedged-shaped cavity means constricting said passageway in response to axial compression of said body for gripping engagement with the catheter.

6. A device as claimed in claim 5 wherein said passageway is formed with a gripping sleeve disposed adjacent said wedged-shaped cavity means, said gripping sleeve being formed with a wall surrounding said passageway for gripping the catheter, said wall of said gripping sleeve constricting said passageway in response to axial elongation of said body for gripping engagement with the catheter, said wall of said gripping sleeve being insertable in the opening defined by said wedged-shaped cavity means for constricting said passageway in response to axial compression of said body for gripping engagement with the catheter.

7. A device as claimed in claim 6 and comprising a toroidal end wall for said body disposed adjacent said sleeve, said toroidal end wall being adapted to receive the catheter in gripping relation therewith, said toroidal end wall being arranged to urge said gripping sleeve into the opening defined by said wedged-shaped cavity means for constricting said passageway in response to axial compression of said body for gripping engagement with the catheter.

8. A device as claimed in claim 7 wherein said body has a conical configuration with the apex thereof disposed adjacent said gripping sleeve.

9. A device as claimed in claim 8 wherein said anchor member is formed with drainage openings spaced from said central passageway.

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