

[54] MALE URINAL DEVICE

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[51] Int. Cl. A61f 5/44

[58] Field of Search 128/275, 295, 294, 283

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[57] ABSTRACT

A male urinal device in which the possibility of any backup of urine around the penis is minimized. The urinal device comprises a urine receptacle connected through a flexible tube to a sheath adapted to be placed over and secured to the penis of the user, the sheath consisting of a thin body portion of resilient material of a thickness between 0.005 and 0.012 inches and relatively large and rigid conical and tubular portions integrally formed with said body portion and of a thickness of between 0.050 and 0.100 inches. There is preferably a bulbous portion formed by extending the conical portion in the direction of the body portion sufficiently that the internal diameter of the conical portion where it joins the body portion is greater than the normal diameter of the body portion, thus providing the bulbous portion without resulting in reentry curves between the body portion and the tube. The conical portion has an internal volume sufficient to accommodate sudden discharges of urine resulting from artificial stimulation of the bladder. The receptacle has a vent therein for escape of air but not of urine as urine enters the receptacle. The receptacle can be disconnected from the sheath by a detachable coupling in the tubing, said detachable coupling having a relatively uniform diameter therein which at no point is less than the internal diameter of the tube.

7 Claims, 5 Drawing Figures

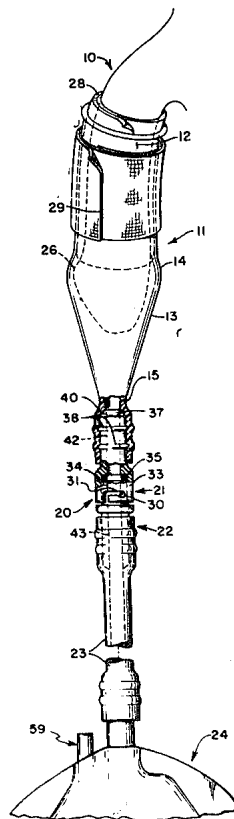


Fig. 2

Fig. 3

Fig. 1

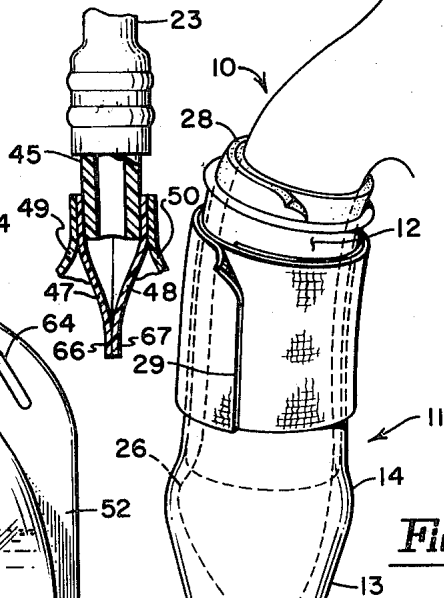
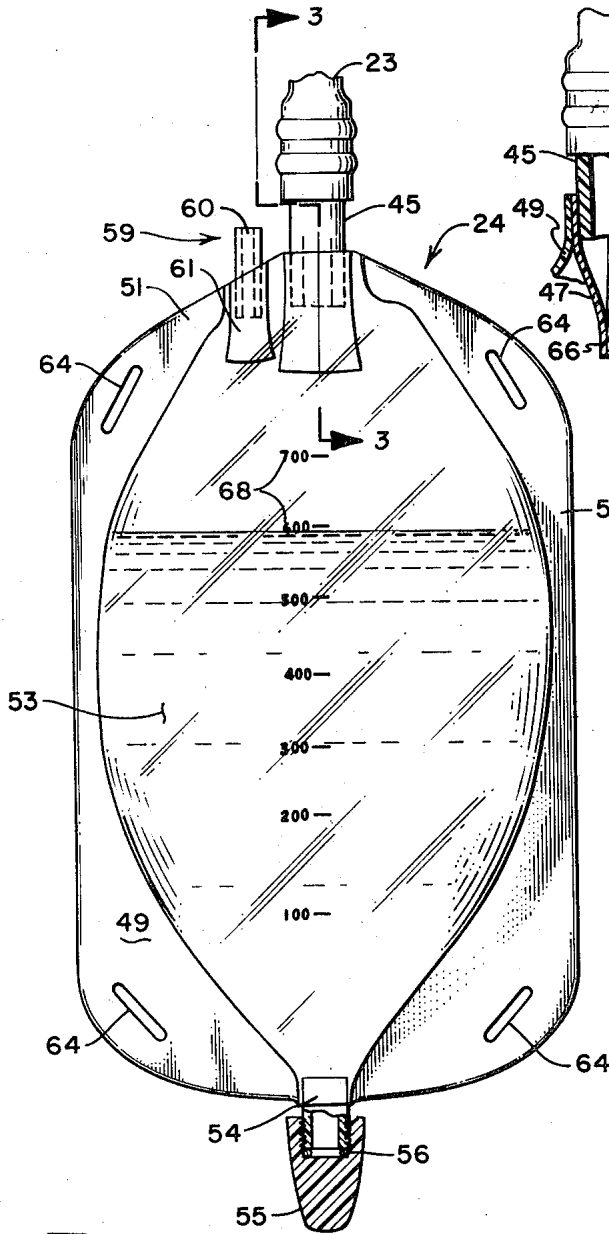


Fig. 4

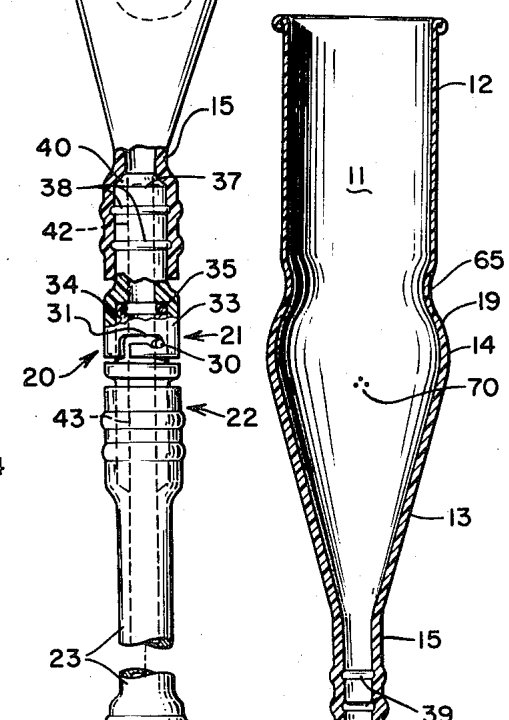
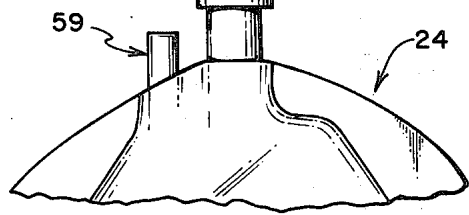
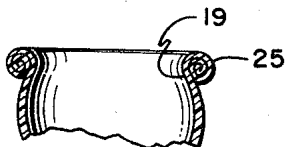


Fig. 5



MALE URINAL DEVICE

BACKGROUND OF THE INVENTION

It is highly desirable in connection with a male urinary device to have a device which can be worn for long periods of time with relative comfort and in which the possibility of backup of urine around the penis is relatively remote. Backup of urine not only results in discomfort but can also lead to infection. The prevention of backup of urine is particularly important in connection with a paraplegic in which there is relatively little control of the bladder. In such cases, it is often necessary to use an artificial stimulator to cause sudden release of the urine from the bladder. At this time, a large volume of urine is released and unless there is adequate provision for temporary storage of the urine and free drainage to the urine receptacle, backup may occur. Furthermore, even where adequate provision is made for drainage, such provision can be rendered ineffective if it is possible to pinch or otherwise obstruct the tube as the body position of the wearer is being shifted.

Numerous attempts have been made to provide various male urinary devices which are intended to be comfortable and to prevent urinary infection. In prior art devices of which the inventors are aware, there is always the possibility of some kind of obstruction either due to the provision of reentry portions which tend to obstruct the flow, to lack of adequate temporary storage capacity immediately adjacent the penis, or to a construction which permits the pinching of the tube or sheath adjacent to the point where it is secured to the penis.

SUMMARY OF THE PRESENT INVENTION

The present invention is concerned with a male urinal device in which there is relatively little possibility of any backup of the urine around the penis. Basically, this is accomplished by providing a relatively large conical portion extending from the body portion of the sheath surrounding the penis, the conical portion and a tube attached thereto being integral with the body portion of the sheath and of relatively thick material so that they are relatively rigid and are not readily flexed. In a typical case, the body portion of the sheath surrounds the shaft of the penis has a thickness of 0.005 and 0.012 inches whereas the conical portion and the tube attached thereto have a thickness of between 0.050 and 0.100 inches.

A further feature of the present invention is that there are no reentry curves between the body portion of the sheath and the urine receptacle. There are also no obstructions anywhere in the tubing between the sheath and the urine receptacle. Thus, while the tube has a detachable coupling therein for enabling ready disconnection of the urine receptacle from the sheath, this coupling has a uniform interior diameter which is not less at any point than the internal diameter of the tubing. The combination of the absence of any reentry curves and any obstructions in the length of the tubing results in a free flow of the urine from the sheath to the urine receptacle.

The conical portion forming the terminal portion of the sheath is relatively large and has an internal volume sufficiently great to accommodate sudden discharges of urine. As pointed out above, it is often necessary with paraplegics to employ an artificial stimulator which will

periodically stimulate the bladder to cause emptying thereof. This results in a large amount of urine being discharged within a relatively short period of time. By providing a conical portion which cannot be pinched closed and which is of a capacity to receive such urine, the possibility of any backup of the urine is further minimized.

We also employ a urine receptacle, such as a leg bag, which has a vent in it adjacent its upper portion, the vent being designed to permit the escape of air but not the escape of urine. Thus, as urine flows into the receptacle, the air that is displaced is able to pass out through the vent. In this way, there is no resistance to the flow of urine through the tubing as a result of pressure building up in the receptacle.

To further aid in the flow of urine out of the sheath, we preferably provide an air vent in the conical portion of the sheath to prevent a suction being built up in the sheath when a large amount of urine is discharged suddenly. Such a suction not only prevents free flow of the urine to the receptacle but also may cause discomfort to the wearer by reason of the penis being drawn against the constricted portion of the sheath.

A further feature of the invention is that the slope of the conical wall is sufficiently gradual that even when the wearer is in an inclined position, the urine still can flow freely without having to go "uphill." This further aids in permitting free flow of the urine regardless of the position of the wearer.

Other objects of the invention will be apparent from a consideration of the accompanying specification, claims and drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a view partly in section showing our urinal device applied to a penis, a portion of the tubing and detachable coupling being shown in section and only a portion of the urine receptacle being shown;

FIG. 2 is a plan view of the entire urine receptacle with hidden portions being shown in dotted lines;

FIG. 3 is a sectional view of the urine inlet of the urine receptacle, the section being taken along the 3-3 of FIG. 2;

FIG. 4 is a cross-sectional view of the sheath portion of the urinal device for attachment to the penis and without the tubing coupling member secured thereto; and

FIG. 5 is a fragmentary view similar to FIG. 4 but showing only a portion of the sheath and showing the body portion completely rolled up until it engages the bulbous portion of the sheath.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, we have shown our improved urinal device secured to a penis 10. The urinal device comprises a sheath 11, having a body portion 12 of relatively thin, resilient material. Integral with and forming a continuation of the body portion 12 is a conical portion 13 which is joined to the body portion 12 by a bulbous portion 14. The conical portion 13 in turn connects to a tubular portion 15. The body portion, as previously mentioned, is of relatively thin, resilient material and preferably has a thickness of between 0.005 and 0.012 inches. The conical portion 13 and the tube 14 is of much thicker material having a thickness of between 0.050 and 0.100 inches. The bulbous portion 14

is of the same thick material. The entire sheath is formed by providing a mold of the desired shape and forming a layer of resilient material, such as latex, over the mold, the layer of resilient material over the body portion of the mold being relatively thin and the layer over the lower portion including portions 13, 14, and 15 being relatively thick. The entire sheath is, however, formed of a continuous piece of resilient material such as latex. The latex, after being applied to the mold in the desired thickness is then cured, as is common, to make the latex stable. Due to the curing and to the relatively large thickness of the conical portion 13, the bulbous portion 14 and the tube 15, it is difficult to flex these portions to any substantial extent. In other words, by reason of this thickness and the curing of the latex, these portions become relatively stiff and resist any tendency for these portions to be pinched off or bent by reason of a change in bodily position of the user. The reason for the upper body portion 12 being relatively thin is that it is highly desirable in applying this sheath 11 to a penis for the body portion 12 to be readily rollable. In FIG. 5, this body portion 12 is shown as rolled up.

The lower tubular portion 15 of sheath 11 is connected through a coupling device 20 to a tube 23 extending to a urine receptacle 24. The coupling 20 preferably comprises two coupling parts 21 and 22 which are readily detachable from each other to permit the fluid container 24 and the tube 23 to be disconnected from the sheath so as to permit convenient emptying of the container 24. The coupling 20 and container 24 will be discussed in more detail later.

Referring again to the sheath 11, it will be noted in FIG. 4 that the bulbous portion 14 is provided by extending the conical portion 13 upwardly to a point where the internal diameter of the conical portion 13 exceeds the diameter of the body portion 12. From this point, the sheath curves inwardly to meet the body portion 12. The enlarged bulbous portion 14 is necessary to accommodate the large portion 26 of the head of the penis. By forming the bulbous portion 14 as a continuation of the conical portion 13, there are no reentry curves below the bulbous portion so as to impede in any way the flow of urine from the penis down through the conical portion 13 into the tubular portion 15.

It will also be noted that the conical portion 13 has a very slow taper. It is preferable that the wall of this conical portion makes an angle of no greater than 30° with respect to the longitudinal axis of the sheath 11. The reason for this is to insure the urine draining freely when the patient is in a reclining position. Even in this position, there is some tendency for the penis to slope downwardly due to the combined effects of the weight of the penis and the effect of the tubing secured to sheath 11. The angle of inclination downwardly, however, is much less when the wearer is in a reclined position or laying in bed than it is when the patient is sitting or standing. Hence, when the wearer is in such a reclined position, the urine does not flow freely and tends to remain in the conical portion 13 of the slope of the conical portion is very large.

The transition from the very thin material of the body portion 12 to the relatively thick material of which the bulbous portion 14, the conical portion 13, and the tube 15 are made, occurs at a point 19 in the area where the bulbous portion 14 curves inwardly to meet the body portion 12. Just prior to this point, the body

portion 12 may be curved inwardly slightly as shown at 65. The purpose of this inwardly curved portion 65 is to facilitate the rolling of the sheath 12 up to the point where it engages the curved wall of the bulbous portion 14. This is best shown in FIG. 5 where the body portion 12 has been completely rolled up. By the time that the rolled up portion, designated in FIG. 5 by the reference numeral 25, reaches the inwardly curved portion 65, it tends to become more difficult to roll due to its bulk. Due, however, to the inwardly curved portion 65, the further rolling of the body portion at this point is facilitated so that the roll 25 can be formed right up to the juncture with the inwardly curved portion of the bulbous portion 14. As it is rolled further, the inward diameter of the roll 25 tends to expand slightly to conform with the inwardly increasing diameter of the curved portion of the bulb adjacent to point 19. In this way, it is possible to roll up the entire body portion 11 into a roll 25 which has a diameter substantially equal to or even greater than the inner diameter of the body portion 12 as shown in FIG. 4. This makes it very easy for the wearer to apply the sheath 11 to the penis. It is merely placed in position, the tip of the penis extending into the conical portion 13, as shown in the dotted portions of FIG. 1, the body portion 12 then being unrolled upwardly along the penis to assume the position shown in FIG. 1.

While it is true that the inwardly curved portion 65 does form a reentry curve in the sheath, this portion is well above the point at which any urine is discharged. Consequently, it does not constitute any obstruction to the flow of the urine. It is also to be noted that any bending or pinching that might obstruct the flow of urine would have to occur beneath the point 19. Thus, over the entire area in which there would be any tendency for the pinching or obstruction of sheath or tubing to result in an impediment to the flow of the urine, the material is relatively thick and stiff to resist any tendency for it to be so pinched off.

While the manner in which the body portion 14 of the sheath 11 is secured to the penis 10 is covered in a separate patent application filed in the name of the present inventors on even date herewith, that application being entitled "Apparatus for Attaching Male Urinal Device," it is to be noted that generally a liner pad 28 of soft, yieldable, liquid tight material is wrapped around the penile shaft beneath the body portion 12 so as to form a liquid-tight cushion and barrier between the sheath 11 and the penis. Wrapped around the outside of the sheath 11 is an elastic tape 29 which is narrower than the pad. Such tape is available on the market and is generally formed of an elastic material which tends to adhere to itself when wrapped under tension in successive layers. While one corner each of the pad 28 and the tape 29 is shown as turned outwardly, this is only for purposes of illustration to show better the nature of the pad and the tape. In actual use, these corners will be in engagement with the underlying layers of the material. As is described in the co-pending application referred to above, this combination of an inner elastic sheath and a flexible outer elastic tape somewhat shorter than the sheath insures that the liquid cannot escape upwardly through the sheath. Also, the sheath can be worn for a long period of time with a high degree of comfort.

Since the combination of the liner pad 28 and the tape 29 results in the sheath being held to the upper

portion of the penis in a liquid-tight manner, there is relatively little chance for air to enter between the upper portion of the penis and the upper portion of the sheath. Consequently, upon a sudden discharge of urine, a vacuum tends to be drawn in the conical portion 13. This will tend to draw the tip of the penis against the sheath and may eventually result in irritation of the tip of the penis as it repeatedly has suction applied thereto. This can be overcome by providing some suitable means for conveying air from the top of the receptacle 24 to the interior of the conical portion 13, such as by a tube connected therebetween. Another way in which this can be accomplished is shown in FIG. 4. It will be noted that there are three small openings 70. These openings are sufficiently small that air can be drawn in through them but that is very difficult for urine to pass outwardly through them. Furthermore, suitable indicia are provided on the sheath 11 to indicate that these openings 70 should be in a position where they are away from the body of the wearer. In other words, when the wearer is lying in bed, these openings should be on the top side of the sheath. Thus, it is further insured that no urine will escape through these openings 70.

Referring now to the coupling 20, as previously noted, this comprises two coupling parts 21 and 22. These are normally held in assembled relationship by a bayonet joint type of construction comprising a pin 30 secured to and projecting outwardly from the member 22 and movable within a slot 31 in the member 21. It is, of course, understood that on the opposite side of the coupling, not visible in the drawing, there is another pin 30 and slot 31. The units are connected together in the usual manner by inserting the pin 30 in the longitudinally extending portion of the slot and then rotating them until they assume the position shown in the drawing in which the pin 30 is retained in the slot 31. The member 22 forms the male member of the coupling unit and the member 21, the female portion. The member 21 has a sheath 33 which surrounds a stem 34 projecting upwardly from the male member 22. As is visible in FIG. 1, a suitable gasket such as an O-ring 35 is interposed between the two to form a liquid-tight seal therebetween. The female member 21 has an upwardly extending stem 37 which is provided with a plurality of annular ribs 38 which are designed to fit within a pair of annular grooves 39 in the tubular portion 15. The grooves 39 are best shown in FIG. 4.

The lower tubing 23 is secured to the other coupling member 22 in a manner very similar to that in which the tube 15 is secured to the upper member 21. It will be noted that the upper stem member 37 has a bore 42 therethrough which substantially corresponds in diameter with the normal internal diameter of the lower portion of the tubular portion 15 of the sheath, the lower end of tubular portion 15 being stretched to permit the insertion of stem 37, the upper end of which is tapered as at 40. Similarly, the fitting 22 has a bore 43 therethrough (shown in dotted lines), this bore likewise being of the same diameter as the bore 42 and of the normal interior diameter of tubing 23. There is thus provided a continuous uninterrupted passage through the two coupling members 21 and 22 which passage corresponds in diameter to the interior diameter of the lower end of tubular portion 15 and of tube 23. In this way, it is assured that there is no obstruction at any point to the flow of the urine from the sheath 11

through the coupling 20. Furthermore, there is a minimum of recesses within which the urine may lodge in its passage to the urine receptacle 24.

Referring now to the urine receptacle 24, this receptacle is provided with an inlet stem member 45 to which the tubing 23 is secured in a liquid-tight manner. The manner in which the tubing 23 is secured to stem 45 is shown in FIG. 3. This may be very similar to the manner in which the tubing member 15 and the stem 37 of coupling member 21 are connected. Secured around the stem 51 at its lower end are two pieces 47 and 48 of resilient material. At their upper portions, they are wrapped around and sealed to the stem member. At their lower end where they project below the stem 51, the pieces are flat and in the form of flaps 66 and 67, these flaps normally being in engagement with each other. Upon passage of urine through tube 23 and stem 45, the resilient pieces 47 and 48 separate enough to allow the passage of the urine therethrough. At the same time, as soon as the urine is passed, they reengage so as to prevent the egress of any urine back from the container through the stem 45 and tube 23 if the receptacle 24 happens to be placed in a horizontal position.

The receptacle 24 is in the form of a leg bag designed to be secured to the leg of the user. It comprises two sheets of flexible material 49 and 50 which are sealed together along their outer edges as indicated at 51 and 52 and are sealed around inlet stem member 45 and resilient pieces 47 and 48, as shown in FIG. 3. Sheet 49 is of transparent material and has indicia 68 thereon to indicate the volume of the liquid. Sheet 50 is opaque and of a color such as white which contrasts with the color of the indicia 68. The upper portions of both sheets 49 and 50 are shown in FIG. 3. Only the transparent sheet 49 is visible in FIG. 2. The two sheets 49 and 50 are separated from each other over a substantial portion of their area to form a liquid-receiving pocket visible in FIG. 2 and indicated by the reference numeral 53. Sealed between the sheets 49 and 50 and extending into this pocket 53 is a drain nipple 54 which is screw threaded at its lower end to receive a closure cap 55. Interposed between the closure cap 55 and the end of the drain nipple 54 is a suitable gasket 56. It will be obvious that upon unscrewing the closure cap 55, the contents of the receptacle 24 will readily drain through the drain nipple 54.

The receptacle 24 is also provided with a vent nipple 59 which is sealed between sheets 49 and 50. This nipple is of the same construction as stem 45, there being a stem member 60 and resilient sheets 61 secured therearound. The lower ends of these sheets are merely biased together as with flaps 66 and 67. Upon urine entering through the tube 23 into the receptacle 24, the air is forced upwardly through the vent nipple 59 separating the two flaps 60 sufficiently to permit the escape of air therethrough. The flaps 61 are biased sufficiently firmly together that no liquid can escape through the vent nipple 59. Thus, as the level of the urine rises in the pocket 53 of receptacle 24, the air being displaced passes out through the vent opening 59. The advantage of this is that there is no appreciable air pressure within the pocket 53 such as might impede the flow of urine down through the container 23 and the entrance stem 55 into the pocket 53. This is a further means for insuring the free flow of the urine from the sheath into the container.

The sealed outer edges 51 and 52 of the sheets 47 and 48 may be provided with slots 64 suitably disposed around the edges 51 and 52 for the reception of straps or other means for fastening the receptacle or leg bag 24 to the leg of the wearer or to any other suitable support for the leg bag.

CONCLUSION

It will be seen that we have provided a male urinary device in which any tendency toward backing up of the urine is substantially eliminated. We have provided not only for receiving sudden discharges of substantial amounts of urine but we have also provided an arrangement in which the urine discharged may flow freely to a urine receptacle regardless of the position of the wearer. Due to the unique design of our urinary device, there is no danger of the flow of urine being interrupted by reason of the device being pinched off. Furthermore, the apparatus is relatively free from any obstructions of any kind between the sheath which is placed over the penis and the urine receptacle. While we have shown a specific embodiment of our invention, it is to be understood that this is only for purposes of illustration and that our invention is limited solely by the scope of the appended claims.

We claim as our invention:

- 1. A male urinal device comprising:
 - a sheath of resilient material adapted to surround a substantial portion of the penis of the user and to be secured thereto,
 - a receptacle for the urine designed for support at a position spaced substantially from the penis, and
 - a flexible tube extending between said sheath and said receptacle for conveying urine from said sheath to said receptacle,
 said sheath having a long thin body portion having a continuously curved cross-section so as to be capable of being readily rolled and a conical neck portion joined to said body portion and of a thickness sufficiently great to tend to prevent folding or col-

lapsing of said neck portion as a result of normal body movements, said body and neck portions being integral with each other and free of any internally projecting portions, said relatively thick conical portion having a circumferential wall disposed at an angle of less than 45° with respect to the horizontal axis of the sheath and having a diameter at its junction with the body portion which is much greater than that of the body portion to provide an enlarged bulbous portion, and said conical portion having sufficient internal volume beyond said bulbous portion to accommodate sudden discharges of urine resulting from artificial stimulation of the bladder.

2. The urinal device of claim 1 in which the thin body portion has a thickness of between 0.005 and 0.012 inches and the conical neck portion has a thickness of between 0.050 and 0.100 inches.

3. The urinal device of claim 1 in which the change in thickness of the sheath occurs adjacent the junction between said bulbous portion and the body portion.

4. The urinal device of claim 1 in which said tube has a detachable coupling therein for permitting detachment of said receptacle and a portion of the tubing for emptying the same, said coupling having a relatively uniform diameter therein which at no point is less than the internal diameter of the tube.

5. The urinal device of claim 4 in which said detachable coupling has two telescoping parts secured together by detachable fastening means.

6. The urinal device of claim 1 in which said receptacle has a vent adjacent the upper wall thereof for permitting escape of air but not urine therefrom as urine enters the receptacle.

7. The urinal device of claim 1 in which there are no reentry curves between the body portion of the sheath and said tube so as to minimize any obstruction to the flow of the urine regardless of the body position of the wearer.

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