

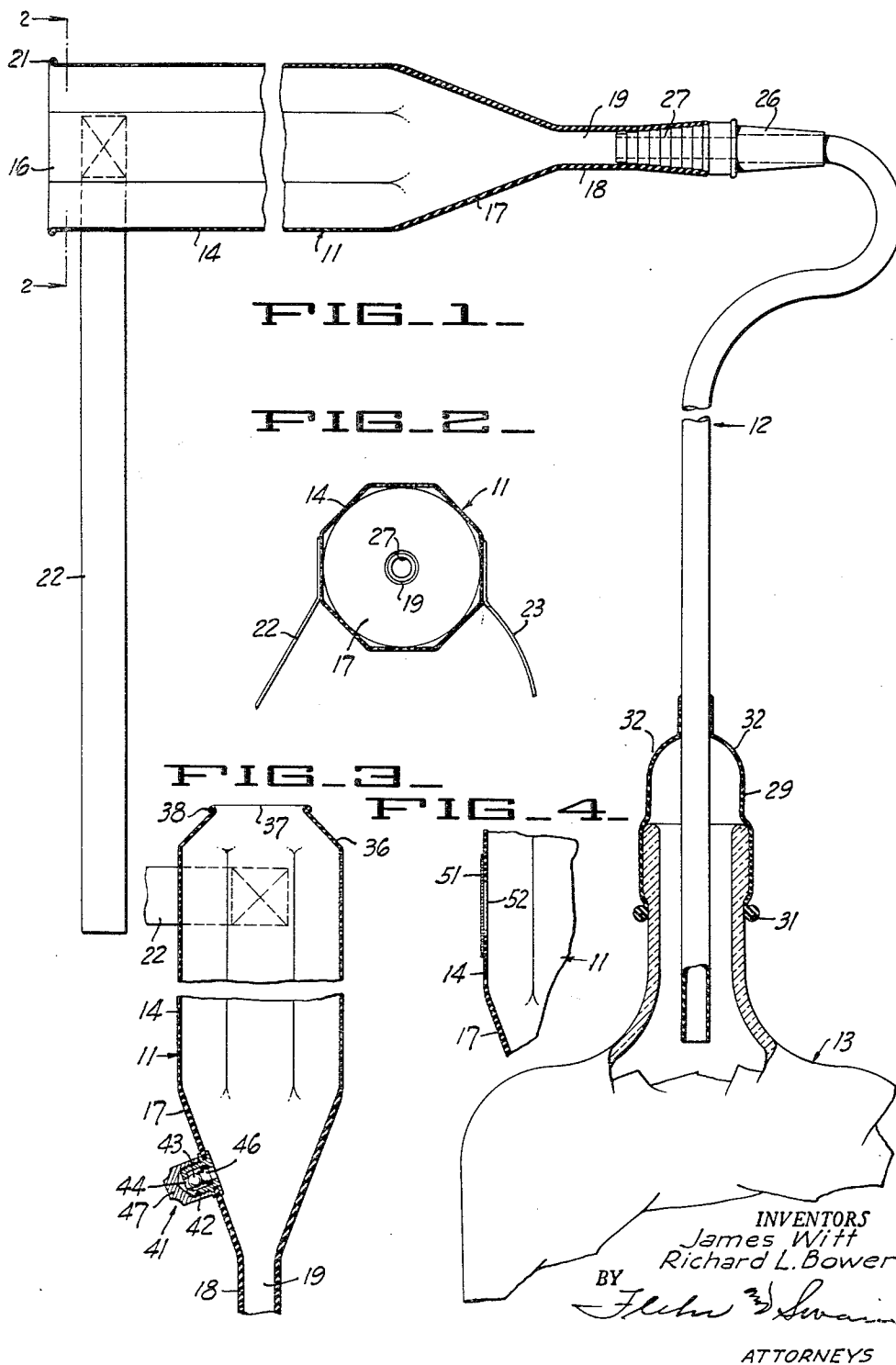
June 14, 1960

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2,940,450

MALE URINE DRAIN

Filed Aug. 20, 1957



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2,940,450

MALE URINE DRAIN

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Filed Aug. 20, 1957, Ser. No. 679,165

4 Claims. (Cl. 128—295)

This invention relates generally to urine drains and more particularly to urine drains for use by male patients.

In the past considerable difficulty has been encountered in removing urine from incontinent quiescent bed or wheel chair patients. Catheterization has often been tried but has been found to have serious disadvantages particularly when utilized on male patients. Since the catheter must be inserted and removed from the urinary tract, it is irritating to the urinary tract and often introduces infection. The catheter when inserted abnormally drains the bladder and will only pass very small kidney or bladder stones. During tumescence of the male organ, the catheter may be very painful and may cause damage to the cavernous tissue. In addition, the insertion of the catheter requires close medical supervision and must generally be done by someone other than the patient. The catheter also clogs easily thus necessitating removal and cleaning. The catheter is also relatively high in cost because numerous other additional components are required for a satisfactory urine drain. Other urinary devices which are attached externally have also been found to be unsatisfactory because they have failed to keep the patient dry with resulting urine irritation and bed sores. In addition, many of the urinary devices create undue irritation, damage blood vessels, restrict venous flow and cause maceration.

In general, it is an object of the present invention to provide a urine drain suitable for use by males which overcomes the above named disadvantages and which encourages natural urination.

Another object of the invention is to provide a male urine drain of the above character which is externally attached to the male patient.

Another object of the invention is to provide a male urine drain of the above character which is attached to the patient in a painless manner.

Another object of the invention is to provide a male urine drain of the above character which permits free urine flow without a build-up of excessive back pressure.

Another object of the invention is to provide a male urine drain of the above character which will not cause pain upon the occurrence of tumescence of the male organ and which will not cause damage to cavernous tissue.

Another object of the invention is to provide a male urine drain of the above character which will cause little pain and no damage if the urine drain is accidentally or intentionally pulled off.

Another object of the invention is to provide a male urine drain of the above character which can be easily attached and detached by the patient.

Another object of the invention is to provide a male urine drain of the above character which can be utilized by incontinent quiescent male bed or wheel chair patients.

Another object of the invention is to provide a male urine drain of the above character which can be utilized by ambulatory patients.

Another object of the invention is to provide a male

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urine drain of the above character which keeps the patient dry at all times.

Another object of the invention is to provide a male urine drain of the above character in which vacuum formation is inhibited.

Another object of the invention is to provide a male urine drain of the above character in which any vacuum formation can be eliminated.

Another object of the invention is to provide a male urine drain of the above character which is relatively low in initial cost, has a long life and is easily cleaned by washing or sterilization.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment has been set forth in detail in conjunction with the accompanying drawing.

Referring to the drawing:

Figure 1 is a side elevational view partly in cross-section showing the urine drain incorporating our invention;

Figure 2 is a cross-sectional view taken along the line 2—2 of Figure 1;

Figure 3 is a side elevational view in cross-section of another embodiment of our penis sheath; and

Figure 4 is a cross-sectional view of another embodiment of our invention.

The male urine drain shown in the drawing consists generally of a male organ or penis sheath 11, a drain tube 12 and a receptacle 13. The sheath, as shown, is formed with a polygonal shaped portion 14 which at one end forms an inlet opening 16 and at the other end is joined to one end of a conical portion 17. The other end of the conical portion 17 is joined to a cylindrical or tubular portion 18 which forms an outlet opening 19.

The polygonal portion 14 may have any number of sides, however, it has been found preferable to form the portion 14 in the shape of an octagon as shown. A bead 21 has been formed adjacent the inlet opening 16 to increase the strength of the portion 14 adjacent the opening. The sheath 11 may be formed of any suitable flexible material, however, we have found it desirable to utilize soft natural rubber or latex because of its elasticity and because it will not harm the skin. The use of soft natural rubber also permits steam sterilization.

Means is provided for securing the sheath 11 to the male organ or penis and consists of a pair of drawstrings 22 and 23 which are bonded to opposite side walls of the polygonal portion 14 near the inlet opening 16. The drawstrings 22 and 23 may be formed of any suitable material such as cotton and preferably should be rather wide to prevent injury to the male organ, as hereinafter described.

The remainder of the urinary drain is substantially conventional and consists of the tube 12 and the receptacle 13. The drain tube 12 can be formed of any suitable material such as plastic or rubber. One end of the tube 12 is connected to an adapter unit 26 which is provided with an end 27 gradually decreasing in diameter in steps as shown. The end 27 of reduced diameter of the adapter unit 26 may readily be inserted in the outlet opening 19 of the sheath 11 to form a watertight seal between the tubular portion 18 of the sheath and the end 27.

The other end of the drain tube 12 is provided with an adapter skirt 29 which is formed of suitable elastic material such as natural rubber. The smaller end of the skirt 29 is bonded to the tubing 12 and the lower end of the skirt is provided with a bead 31 to reinforce the lower end. The lower end of the adapter skirt 29 faces in the same direction as the end of the tubing and is adapted to be inserted over the neck of the receptacle 13 which in this case is a bottle and serves to hold the

lower end of the drain tube 12 within the neck of the bottle. It will be noted that the inner diameter of the neck of the bottle is substantially greater than the outer diameter of the tubing 12 to facilitate passage of air between the tubing and the neck of the bottle. Openings 32 are provided in the skirt to permit the passage of air into and out of the bottle.

The operation and use of our urine drain may now be described as follows: To utilize the urine drain, the connector or adapter unit 26 is inserted in the outlet opening 19 of the penis sheath by rolling the tubular tip 18 onto the stepped end 27 of the connector 26. The sheath is then held so that the draw-strings depend from the sides of the sheath and the inlet opening 16 of the sheath is then spread apart and the male organ or penis is inserted into the sheath until the inlet opening 16 and the bead 21 are adjacent the shank of the male organ. The drawstrings 22 and 23 are then pulled together across the top of the male organ and tied snugly into a knot and preferably into what is called a bow knot rather than a square knot or granny knot. The elastic skirt 29 may then be slipped over the outside of the neck of the bottle after the far end of the tubing 12 has been inserted into the bottle.

The urine drain hereinbefore described is particularly adaptable for use for incontinent quiescent male bed or wheel chair patients. The drawstrings serve to secure the sheath 11 securely to the penis to retain the sheath on the penis. The snug fit on the penis also prevents urine from flowing out of the inlet opening of the sheath. The drawstrings are of a sufficient width to place the hold-on forces on the organ over a relatively wide area and, therefore, serve to grip the organ gently. Excessive pressure on the surface blood vessels and restriction of the venous blood flow is, therefore, avoided.

The interior of the octagonal portion 14 adjacent the inlet opening 16 is provided with a roughened interior surface. Such a rough surface may be provided by forming the sheath on a wood form. This roughened interior surface serves to increase friction and, therefore, serves to improve the grip on the male organ.

It has been found that forming the portion 14 in a suitable polygonal shape such as octagonal serves to prevent the sheath from totally collapsing and sticking together. Such a shape also provides a relatively large air chamber adjacent the penis which facilitates the operation of the urine drain by providing an air evaporation area. The conical end portion 17 by its shape and thickness also serves to prevent the sheath from collapsing for the same purpose. By preventing collapse of the sidewalls, the sidewalls are kept apart so they cannot stick together.

The sheath 11 has been formed of sufficient length to prevent creep off during tumescence. Since only the top portion of the sheath has been tied together by the drawstrings 22 and 23, the lower portion of the sheath may stretch to accommodate tumescence of the male organ without injury to the male organ.

Vacuum formation within the sheath 11 is undesirable because this serves to maintain wetness in the sheath and prevents evaporation. This vacuum condition is alleviated in part by the openings 32 in the skirt 29. It is also believed that vacuum formation is inhibited by a slight air entry between the shank of the penis and the roughened interior surface of the sheath 11. Air may also enter through the excess material of the sheath which is drawn up under the drawstrings. A slight amount of air may also creep onto the interior of the sheath past any pubic hairs that may be caught between the sheath and the interior surface of the sheath and the shank of the penis.

The conical portion 17 and the tubular tip 18 are so positioned that all urine in the sheath will readily drain down the tube 12 without the formation of pools within the sheath. The sidewalls of the sheath 11 are formed of

sufficient thickness to avoid ballooning during rapid urine discharge and possible rupture of the sheath.

The use of our urine drain is particularly desirable because the exterior attachment avoids the risk of introduction of infection which may be caused if catheters are used. The use of the urine drain is painless even upon tumescence of the male organ because of the construction of the sheath.

The urine drain may be readily attached and detached by the patient or another individual. Close medical supervision is not required.

One sheath 11 found to be particularly satisfactory had the following dimensions. The octagonal portion 14 had a length of $5\frac{1}{8}$ " and had a width of $1\frac{3}{8}$ ". The conical portion 17 had a length of $1\frac{1}{2}$ " and the tubular tip 18 had a length of $1\frac{1}{4}$ " and a diameter of $\frac{1}{4}$ ". The sheath was formed of natural rubber latex. The octagonal portion 14 had a thickness of .015 of an inch and the conical portion 17 and the tubular tip 18 had a thickness of .025 of an inch.

Another embodiment of a penis sheath is shown in Figure 3 and is similar to that shown in Figure 1 except that the end adjacent the polygonal portion 14 is formed with a tapered portion 36 to provide an inlet opening 37 of reduced diameter. The tapered portion 36 may be conical or may be polygonal as is the portion 14. A bead 38 is formed adjacent the inlet opening 37 to reinforce the inlet opening. The inlet opening 37 formed by the portion 36 may be readily distended to permit introduction of the penis into the sheath. The inlet opening 37, however, is of such a size that the tapered portion 36 will firmly but gently grasp the shank portion of the penis. The tapered portion 36 will grasp the shank of the penis in such a manner that the grasp will take place over a relatively large longitudinal area rather than on a circular line around the shank of the penis.

One penis sheath found to be particularly satisfactory embodying the invention hereinbefore described in conjunction with Figure 3 had an inlet opening 37 of $\frac{3}{4}$ " in diameter and the tapered portion 36 formed an angle of 45° with respect to the polygonal portion 14.

The embodiment of the penis sheath shown in Figure 3 also includes an automatic breather valve 41 on the conical portion 17 midway between the ends of the conical portion 17 and in line with the panel or wall of the upper side of the octagonal portion 14 between the drawstrings 22 and 23. The breather valve as shown consists of a body 42 which carries a ball 43 which is normally urged against a seat 44 by a spring 46. A cap 47 is also provided for closing the valve. The valve is normally held in a closed position by the spring 46 and opens only when a vacuum condition has been created within the penis sheath 11 and in the drainage tubing. The cap 47 prevents inadvertent operation or leakage of the valve.

The penis sheath shown in Figure 3 is particularly adapted for use by ambulatory patients and may be used in a manner similar to that shown in Figure 1 except that the tube 12 would be connected to a receptacle or container which could be carried on the person of the patient such as by strapping the receptacle to the leg of the patient. The sheath can also be supported by a detachable belt or the like well known to those skilled in the art and secured to the waist of the patient. After urination has occurred and if a vacuum condition exists within the sheath, the cap 47 may be removed to allow the breather valve 41 to operate to alleviate the vacuum condition.

It should be noted that the conditions which inhibit vacuum formation in the sheath shown in Figures 1 and 2 are also present in the embodiment shown in Figure 3.

Another embodiment of our invention is shown in Figure 4. It is similar to that of Figure 3 except that a fine weave cloth 51 has been substituted for the valve 41. As shown, the cloth patch which may be of any suitable shape such as circular or oval has its margins bonded

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to the sheath so that the patch covers the opening 52. The opening is placed a slight distance above the conical portion 17 on the panel between the drawstrings 22 and 23. The cloth patch is of such a weave that urine leakage is prevented but air is permitted to enter to prevent a vacuum formation in the sheath.

It is apparent from the foregoing that we have provided a greatly improved urine drain that encourages natural urination and which is particularly adaptable for use by quiescent male bed or wheel chair patients because it keeps the bedding dry and thereby prevents urine irritation and bed sores. It is also readily apparent that the embodiments of our invention shown in Figures 3 and 4 are particularly adaptable for use by ambulatory male patients.

We claim:

1. In a male urine drain adapted to be secured to the penis, a penis sheath of a pliable relatively thin elastic material adapted to enclose the penis, said penis sheath being formed with a polygonal portion having a length greater than the length of the penis, the polygonal portion being formed with an annular bead at one end defining an inlet opening which has a diameter smaller than the normal diameter of the penis and which is adapted to clasp the shank of the penis, said penis sheath also being formed with a conical portion contiguous to the other end of said polygonal portion and a tubular tip contiguous to the conical portion and defining an outlet opening, a pair of draw strings of relatively wide material secured to opposite side walls of the polygonal portion adjacent the inlet opening, the draw strings being adapted to be tied on one side of the penis sheath to secure the sheath to the penis, the side of the polygonal portion opposite the side on which the draw strings are tied being free to stretch to accommodate tumescence of the penis, means for alleviating any vacuum condition arising in the sheath, and means connected to the outlet opening of the sheath for receiving the urine.

2. A urine drain as in claim 1 wherein the means for alleviating the vacuum condition is provided in said sheath at a point remote from the inlet opening and at a point normally spaced from the penis to permit the ready entrance of air into the sheath upon the formation of a vacuum condition in the sheath.

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trance of air into the sheath upon the formation of a vacuum condition in the sheath.

3. In a male urine drain adapted to be secured to the penis, a penis sheath of a pliable relatively thin elastic material adapted to enclose the penis, the penis sheath being formed with a polygonal portion having a length greater than the length of the penis, a conical portion contiguous to one end of said polygonal portion, the conical portion being formed with an annular bead defining an inlet opening having a size substantially smaller than the size of the polygonal portion, said bead being adapted to firmly clasp the shank of the penis, an additional conical portion contiguous to the other end of said polygonal portion and a tubular tip contiguous to the conical portion and defining an outlet opening, a pair of relatively wide draw strings of a cotton-like material secured to opposite side walls of the polygonal portion adjacent the conical portion forming the inlet opening, said draw strings normally extending in the same direction at right angles to the longitudinal axis of the sheath, the draw strings being adapted to be tied in a knot on one side of the penis sheath to secure the sheath to the penis, the draw strings serving to apply the hold on forces to the penis over a relatively wide area, the side of the sheath opposite the side on which the draw strings are tied being adapted to stretch to accommodate tumescence of the penis, means for alleviating any vacuum condition arising in the sheath and means connected to the outlet opening of the sheath for receiving the urine.

4. A urine drain as in claim 3 wherein said means for alleviating the vacuum condition in the sheath is mounted on the sheath and comprises means for permitting air to enter the sheath and serving to prevent the passage of urine therethrough.

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