

March 20, 1973

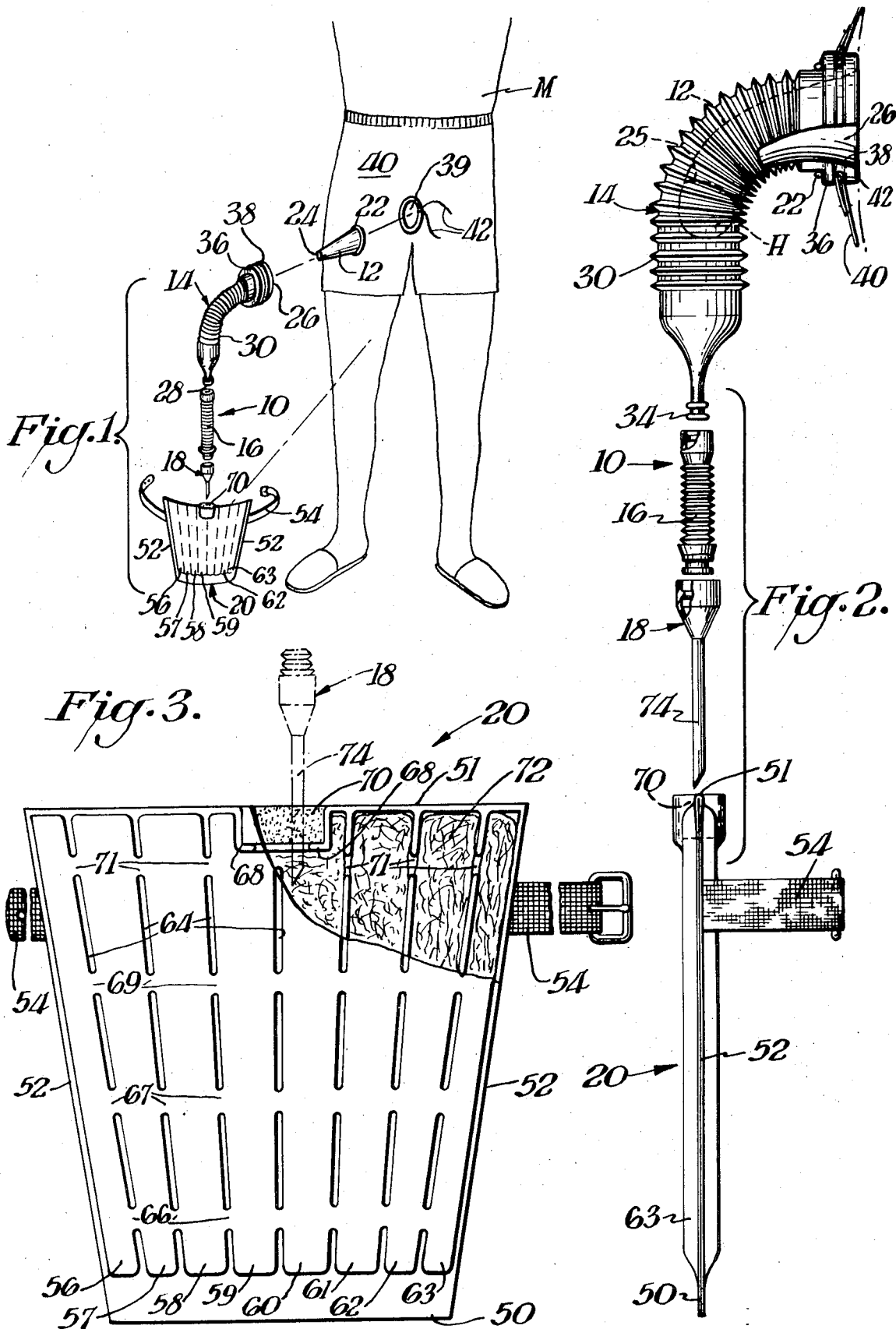
D. HESTERMAN ET AL

3,721,243

MALE URINARY INCONTINENCE DEVICE

Filed July 16, 1970

3 Sheets-Sheet 1



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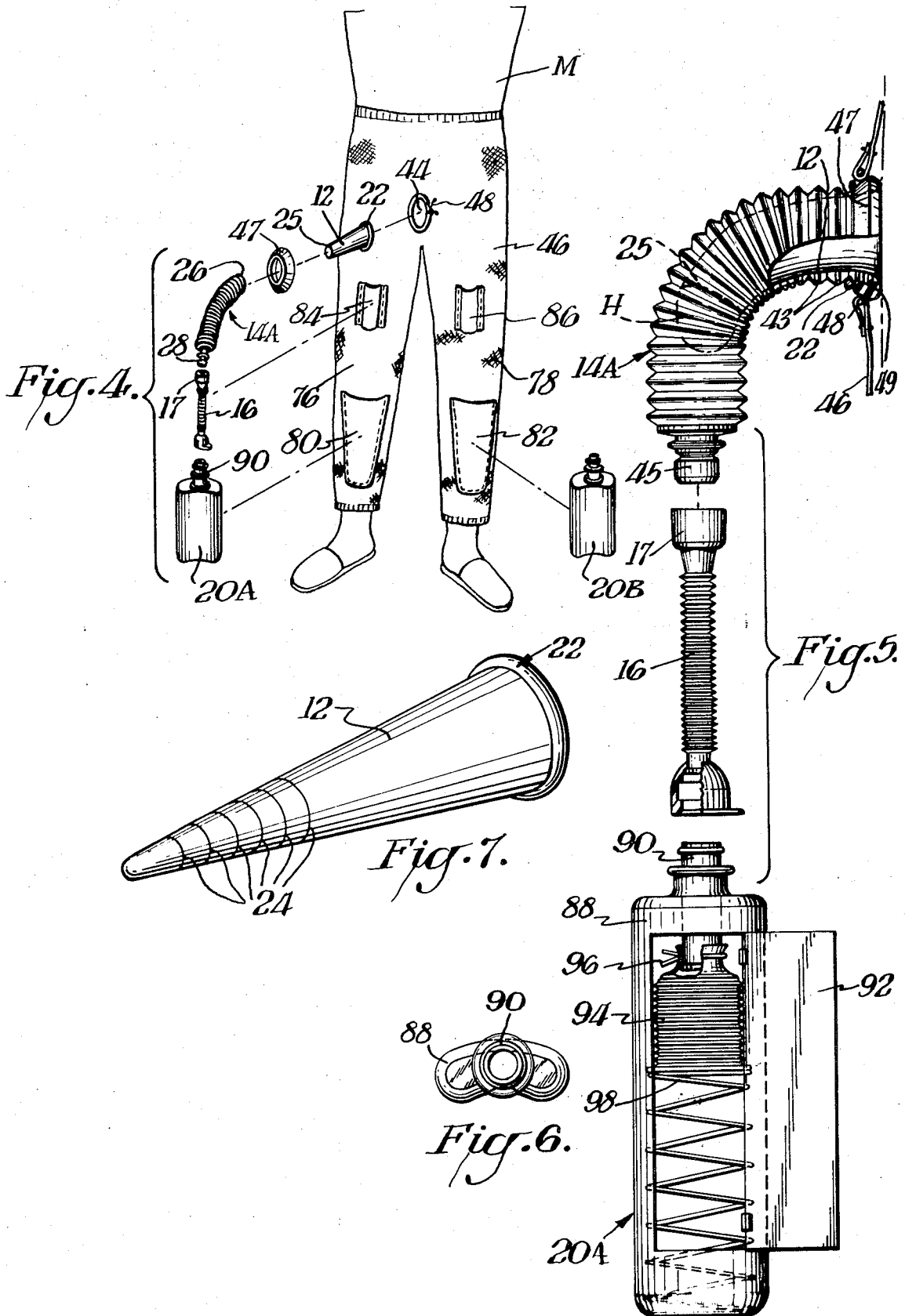
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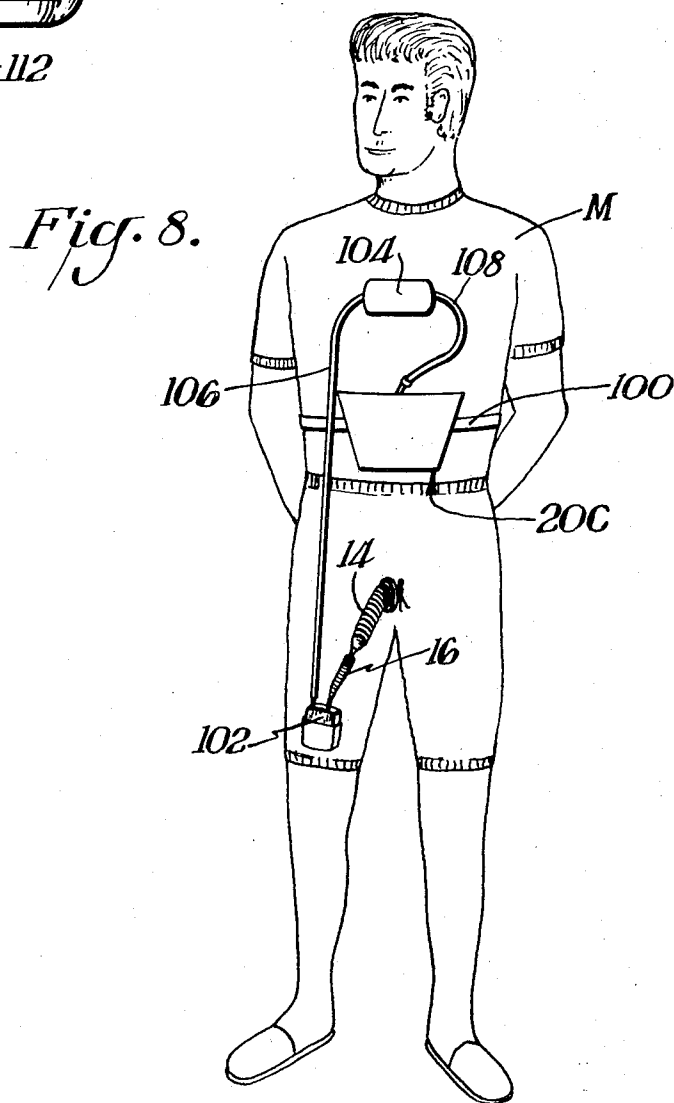
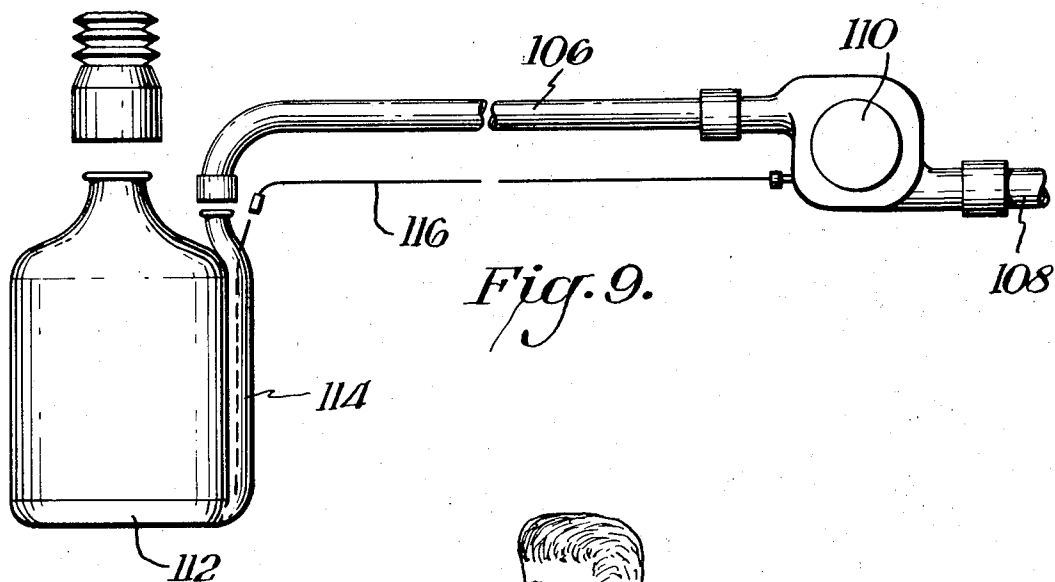
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MALE URINARY INCONTINENCE DEVICE
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ABSTRACT OF THE DISCLOSURE

A male urinary incontinence device includes an elongated tubing which has an open proximal end for insertion over the male organ and an open distal end which communicates with a collector through conveying means. The tubing is designed to be compressible and extendable so as to create a negative pressure therein upon compression and subsequent extension.

BACKGROUND OF THE INVENTION

This invention relates to a male urinary incontinence device which is adaptable for non-ambulatory use such as wheel chair, bedridden or geriatric patients, as well as for ambulatory or active use. Such a device is needed in nursing homes, institutions, hospitals and the like for adults as well as children. Present products attempting to fulfill these needs are inadequate, compromising unreliable and uncomfortable, and frequently cause great embarrassment to the user because of their ineffectiveness.

Diverse prior art attempts for fulfilling the above needs are exemplified by U.S. Pats. 3,394,703; 3,369,546; 3,316,911; 3,138,160; 3,032,038; 2,310,505, and 1,687,717. For various reasons these devices, however, have not provided satisfactory solutions to the problem of obtaining a reliable and effective urinary incontinence device.

SUMMARY OF THE INVENTION

An object of this invention is to provide a male urinary incontinence device which fulfills the above needs.

A further object of this invention is to provide such a device which is universally effective for both adults and children.

A yet further object of this invention is to provide such a device which may be economically made of disposable parts.

A still further object of this invention is to provide such a device which permits ready inspection of the various parts to insure proper functioning thereof.

In accordance with this invention the male urinary incontinence device includes an elongated tubing which has an open proximal end for insertion over the male organ and an open distal end which communicates with a collector through conveying means. The tubing is designed to be compressible and extendable so as to create a negative pressure therein upon compression and subsequent extension.

In an advantageous form of this invention a sheath which is open at both ends is secured on the male organ with one end of the sheath being wrapped around the proximal end of the tubing. The sheath has the plurality of functions of providing a sanitary protective covering for substantially the entire male organ, of providing a means of supplementary attachment of the tubing to the male organ and of providing means for sealing the proximal end of the tubing to facilitate the creation of a negative pressure therein and to provide an effective seal to prevent escape of urine therefrom. The creation of such a negative pressure is desirable to facilitate the attachment to the organ in that the negative pressure draws out

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or extends the male organ and thereby facilitates its entry into the tubing.

The tubing may advantageously incorporate a bellows formation over the major part of its length to permit the compression and extension thereof. The tubing wall may taper smoothly into a restricted cross-sectional area at the distal end thereof to facilitate the coupling of the distal end to conveying lines. Additionally, the tubing may include a shoulder adjacent its proximal end for engagement with the inner sheath and for attachment to a garment.

A particularly advantageous collector for use in the device includes a pouch which is trapezoidally shaped having a narrow bottom wall parallel to an elongated upper wall both of which are interconnected by inclined side walls. The pouch is made of a flexible material so as to conform to the leg of the user when fastened in place. Advantageously the pouch includes a plurality of side by side compartments which communicate with each other. The pouch is coupled to the urine conveying lines at the top wall with communication being had with the compartments.

THE DRAWINGS

FIG. 1 is an exploded pictorial view of a male urinary incontinence device in accordance with one form of this invention;

FIG. 2 is an exploded elevation view of the device shown in FIG. 1;

FIG. 3 is a front elevation view partly broken away of a collector used in the device of FIGS. 1-2;

FIG. 4 is an exploded pictorial view of a modified form of device in accordance with this invention;

FIG. 5 is an exploded elevation view of the device shown in FIG. 4;

FIG. 6 is a top plan view of the collector shown in FIGS. 4-5;

FIG. 7 is a pictorial view of a sheath usable with the device shown in FIGS. 1-2 and 4-5;

FIG. 8 is a perspective view of a further form of this invention worn by a user; and

FIG. 9 is an elevation view of a portion of a modified form of this invention.

DETAILED DESCRIPTION

FIGS. 1 and 2 show a male urinary incontinence device 10 in accordance with this invention. As indicated therein device 10 includes an inner sheath 12, an outer tubing 14, a conveying line 16, an adapter 18 and a collector 20 which are worn by the user M.

Inner sheath 12 is shown in greater detail in FIG. 7. Sheath 12 is in the form of a membrane which may be cylindrically shaped or as shown in FIG. 7 may be substantially conically shaped. The proximal end of sheath 12 may be beaded as indicated at 22 while the distal or remote end may include indicia 24 such as color banding, number coding, etc., to provide a measuring gauge whereby a sheath of proper length and diameter will be selected to assure optimal fitting of the sheath snugly around the male organ. When sheath 12 is cut at the proper indicia 24, the open distal end 25 thereof is attached around the neck of the organ. Accordingly, the inner sheath 12 which is made of an elastic membranous material permits the wide variations of retraction, projection, distention and contraction normal to this organ assuring that constant and positive seal is maintained. Since only the head H of the organ is exposed, sheath 12 provides a safe, sanitary covering which intimately contacts the male organ over substantially the entire length of the organ. As later described as an additional function of the sheath 12 is to provide a seal. This inner seal inhibits fluids by-pass.

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FIGS. 1-2 further illustrate the tubing 14 which is an important feature of this invention. As indicated therein tubing 14 includes an open proximal end 26 and an open distal end 28. Tubing 14 also includes a bellows formation 30 over the major length of its side wall. The side wall then smoothly tapers into a restrictive cross-sectional area 32 and includes coupling means 34 at distal end 28. Tubing 14 additionally includes an external annular shoulder 36 and a groove 38 at its proximal end 26. In use the proximal end 26 is sealed by folding the beaded end 22 of sheath 12 over the proximal end until the beaded end 22 rests against shoulder 36. Alternatively the tubing and sheath may be integral by thinning out the tubing at its proximal end. The unit is secured in aperture 39 of the garment 40 worn by user M by any suitable means such as draw strings 42 which are drawn together in groove 38.

In operation sheath 12 is mounted on the body organ and beaded end 22 is folded over shoulder 36 of tubing 14 to seal proximal end 26. The tubing 14 and sheath 12 are secured to the garment, while the connecting line 16 and collector 20 are secured in place. Tubing 14 is then compressed to expel air therefrom and while compressed, distal end 28 is included and subsequently extended thereby creating a negative pressure or suction affect therein. This negative pressure draws out or extends the male organ and introduces it into the tubing. Transfer line 16 is then attached to the tubing.

The tubing 14A in the embodiment shown in FIG. 4 also includes an open proximal end 26 and an open distal end 28. The bellows formation 30 incorporates a spiral spring 43 which provides sufficient stiffness to the tubing while permitting the desired amount of flexibility. The distal end 28 also includes a nipple 45 of reduced cross-section or other suitable coupling means for engagement with the coupling 17 on conveying line 16. In practice an elastic grommet 47 which includes an internal groove 49 is engaged over the last coil of spring 43. Grommet 47 thus constitutes a shoulder over which the beaded end 22 of the sheath 12 is wrapped as shown for example in FIG. 5. The tubing 14 is then mounted in aperture 44 of garment 46 by means of snap ring 48 secured to the garment and disposed in back of the shoulder formed by grommet 47.

The distal end 28 of tubing 14 or 14A is connected to collector 20 by any suitable conveying means such as a tubing or line 16 which may be of straight cylindrical shape or may be of the illustrated bellows form. The conveying line 16 may be provided in sets of various lengths so that the proper length can be selected in accordance with the needs of the individual user. In some instances it might even be possible to omit line 16 completely and secure tubing 14 directly to collector 20. In the embodiment shown in FIGS. 1-3 a particular adapter 18 serves to connect the conveying line 16 with collector 20. This adapter will be described in greater detail hereinafter.

FIG. 3 shows a particularly suitable collector 20 for use in this invention. As indicated therein collector 20 is in the form of a pouch which is trapezoidally shaped having a narrow bottom wall 50 parallel to an elongated top wall 51 interconnected by inclined side walls 52, 52. Pouch or collector 20 is made of a flexible material for wrapping around and conforming to the leg of the user. For this purpose any suitable fastening means 54 is provided. Advantageously a plurality of side by side compartments 56-63 are provided in pouch 20. The compartments are formed by spaced heat seal seams 64 with the seams being periodically broken as indicated by the reference numerals 66, 67, 69, 71 to provide a plurality of openings whereby the compartments communicate with each other. Adjacent the central compartments 59, 60 are a pair of positioning ledges 68 which likewise may be formed by heat sealing the material at this location. The purpose of these ledges 68 is to act as stop means for a block 70 of self-sealing material for maintaining block 70 in position juxtaposed by top wall 51. Block 70 may

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be made of any suitable self-sealing material such as cellular polyurethane. (Other types of one-way valves such as a flutter valve may be used in place of block 70.) As also shown in FIG. 3 each compartment is substantially filled with an absorbent material 72.

In operation collector 20 is strapped to the leg of the user and adapter 18 is secured thereto by means of a hollow needle 74 disposed at the end of adapter 18. Needle 74 pierces completely through block 70 until the needle communicates with for example compartment 60 thus forming a passageway for the urine to enter collector 20. The self-sealing nature of block 70 causes the needle 74 to be firmly held in place. Moreover, although the pouch 20 is intended to be disposable, if subsequent use is desired, the self-sealing nature of block 70 closes the hole formed by needle 74 to effectively seal the pouch.

As urine is received in collector 20 only compartment 60 receives the urine which flows through the lower openings 66 into the other compartments. The upper openings 67, 69, 71 also adapt the compartments to communicate with each other and collect urine until eventually the entire pouch 20 is filled. The urine entering these compartments is absorbed by material 72. Because of the baffled arrangement created by these intercommunicating compartments and because of the inclusion of absorbent material 72, pouch 20 effectively prevents a splashing noise or a feeling of liquid motion which would otherwise cause embarrassment as is encountered with conventional devices.

Although FIG. 3 illustrates the self-sealing material to be disposed above a single central compartment 60 the self-sealing material could also be disposed over any of the other compartments or even over other sets of compartments without departing from the spirit of this invention.

FIGS. 4-5 show a modified form of this invention. As indicated therein garment 46 is for example made of stretchable material similar to conventional leotards so that the garment will stretch to fit snugly on the user M. Garment 46 includes a pair of leg sections 76, 78 each of which includes a pocket 80, 82 and tunnels 84, 86. Collector 20A is inserted in pocket 80 while a reserve collector 20B is inserted in pocket 82. The conveying lines 16 are also inserted through tunnels 84 so that the entire unit is as compact as possible. When collector 20A is filled conveying line 16 is disconnected therefrom, is removed from tunnel 84 and is inserted through tunnel 86 for connection to reverse collector 20B.

FIGS. 5-6 show the details of this further advantageous form collector 20A. As indicated therein the collector is in the form of a hollow housing 88 having a conduit 90 extending through its top wall and with a door 92 selectively exposing the interior thereof. Mounted within the interior is a bellows-like container 94 which is secured to the end of tubing 90 by a snap ring 96 or any other suitable coupling means. Container 94 is maintained in a collapsed position by spring 98 reacting against bottom of housing 88 and the bottom of container 94. The spring 98 is selected of such resiliency that as urine collects in container 94 the spring is compressed permitting container 94 to expand until it is full. FIG. 6 indicates the curved shape of housing 88 for closer conformance to the body.

FIG. 8 illustrates a further embodiment of this invention wherein the main collector 20C is strapped by any suitable fastening means 100 to the abdominal or upper area of the user M. Since collector 20C is thus above the male organ, means must be provided to cause the urine to flow into collector 20C. As illustrated in FIG. 8 this arrangement includes temporary reservoir 102 upstream from a pump 104 which, in turn, communicates with reservoirs 20C and 102 by conveying lines 106, 108. Advantageously, pump 104 is a suitable thoracic pump which obtains its pumping action from

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the body movement attendant with the breathing of the user M.

Although FIG. 8 illustrates a thoracic pump, other types of pumps such as electricity or manually driven pumps may be also used. FIG. 9 for example shows a battery operated or electrical pump 110 which has urine transfer lines 106, 108 connected thereto. Such a pump is particularly suitable with a temporary container 112 of the type illustrated therein including a conduit 114 attached to its side and communicating with interior of container 112. Conduit 114 is connected at its upper end to conveying line 106. Advantageously sensing element 116 is disposed in conduit 114 and is connected to pump 110 for sensing the level of urine in the conduit 114 and thus also the level in the container 112 to initiate and/or halt the pumping action of pump 110 in accordance with the level of urine therein.

As previously indicated various parts of the urinary device may be made of disposable material. Such parts for example could be the sheath 12, the pouch-like container 20 illustrated in FIG. 3 or container 94 of FIG. 5. Additionally, by making various components transparent, such as sheath 12, tubing 14, conveying line 16 and the collectors, ready visual inspection may be had to assure that all of the components are operating properly. Device 10 provides a unification of its individual components in such a manner as to result in uncompromising physical attributes and psychological security to the user. The visual inspection of the contained male organ, the disposability of various components, the choice of receptacle or collector positioning, the comfort, the ultimate personal hygiene, and the ease of application by the affected individual or by a person providing assistance thereto enable device 10 to fulfill the needs required for a truly effective male urinary incontinence device.

We claim:

1. A male urinary incontinence device comprising an elongated tubing for fitting over the male organ, said tubing having an open proximal end and an open distal end, sealing means for receiving said male organ and substantially closing said open proximal end with the tip of the male organ protruding through said sealing means and extending into said tubing, said tubing being compressible and extensible to create a negative pressure therein upon compression thereof and subsequent extension, a urine collector, conveying means connecting said urine collector to said distal end of said tubing whereby urine may flow into said collector, said sealing means comprising a sheath disposed in said tubing, said sheath being open at both ends for snugly fitting on the male organ with the tip of the male organ extending beyond said sheath into said tubing, one of said open ends of said sheath being folded over said proximal end of said tubing to substantially close said proximal end, and at least a portion of said tubing incorporating a bellows formation which is lineally deformable to selectively extend and compress while maintaining its diameter substantially constant.

2. A male urinary incontinence device comprising an elongated tubing for fitting over the male organ, said tubing having an open proximal end and an open distal end, sealing means for receiving said male organ and substantially closing said open proximal end with the tip of the male organ protruding through said sealing means and extending into said tubing, said tubing being compressible and extensible to create a negative pressure therein upon compression thereof and subsequent extension, a urine collector, conveying means connecting said urine collector to said distal end of said tubing whereby urine may flow into said collector, said sealing means comprising a sheath disposed in said tubing, said sheath being open at both ends for snugly fitting on the male organ with the tip of the male organ extending beyond said sheath into said tubing, one of said open ends of said sheath being folded over said proximal end of said tubing to substantially close said proximal end,

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said tubing incorporates a bellows formation to permit the compression and extension thereof.

3. A device as set forth in claim 2 including a garment to be worn on the user, said garment having an aperture therein, said proximal end of said tubing being disposed in said aperture, and draw strings around said aperture securing said garment to said tubing.

4. A device as set forth in claim 2 including a garment to be worn on the user, said garment having an aperture receiving said proximal end of said tubing, an annular groove in said tubing adjacent said proximal end, and a snap ring holding said garment and said proximal end together by said snap ring seating in said groove with said garment inserted therebetween.

5. A device as set forth in claim 2 wherein said collector is a pouch having a plurality of communicating compartments.

6. A male urinary incontinence device comprising an elongated tubing for fitting over the male organ, said tubing having an open proximal end and an open distal end, sealing means for receiving said male organ and substantially closing said open proximal end with the tip of the male organ protruding through said sealing means and extending into said tubing, said tubing being compressible and extensible to create a negative pressure therein upon compression thereof and subsequent extension, a urine collector, conveying means connecting said urine collector to said distal end of said tubing whereby urine may flow into said collector, said sealing means comprising a sheath disposed in said tubing, said sheath being open at both ends for snugly fitting on the male organ with the tip of the male organ extending beyond said sheath into said tubing, one of said open ends of said sheath being folded over said proximal end of said tubing to substantially close said proximal end, said collector is a pouch having a plurality of communicating compartments, each of said compartments is substantially filled with absorbent material, said compartments communicating with each other by a plurality of openings between each pair of adjacent compartments, and coupling means in one of said compartments communicating with said conveying means in such a manner that said compartments act as a baffle as said pouch is filled with urine.

7. A device as set forth in claim 6 wherein said coupling means includes a one-way valve disposed at the top of said one compartment.

8. A device as set forth in claim 7 wherein said one-way valve is a block of self-sealing material, said coupling means further including a hollow needle penetrating completely through said block and extending in said one compartment, and said conveying means being secured to said needle.

9. A device as set forth in claim 8 wherein said pouch is flexible and trapezoidally shaped for closely conforming to the leg of the user, and said pouch and said tubing being transparent to permit visual inspection therein.

10. A male urinary incontinence device comprising an elongated tubing for fitting over the male organ, said tubing having an open proximal end and an open distal end, sealing means for receiving said male organ and substantially closing said open proximal end with the tip of the male organ protruding through said sealing means and extending into said tubing, said tubing being compressible and extensible to create a negative pressure therein upon compression thereof and subsequent extension, a urine collector, conveying means connecting said urine collector to said distal end of said tubing whereby urine may flow into said collector, including stretch pants to be worn on the user, said stretch pants having a leg section, a pocket being in said leg section, said collector being disposed in said pocket, a tunnel in said leg section above said pocket, and said conveying means being disposed in said tunnel.

11. A device as set forth in claim 10 wherein said pants includes a second leg section having a second pocket, a

second tunnel disposed above said second pocket, and a second collector in said second pocket.

12. A male urinary incontinence device comprising an elongated tubing for fitting over the male organ, said tubing having an open proximal end and an open distal end, sealing means for receiving said male organ and substantially closing said open proximal end with the tip of the male organ protruding through said sealing means and extending into said tubing, said tubing being compressible and extensible to create a negative pressure therein upon compression thereof and subsequent extension, a urine collector, conveying means connecting said urine collector to said distal end of said tubing whereby urine may flow into said collector, said collector being a hollow housing, a bellows-like container being in said housing, said conveying means extending through the wall of said housing and communicating with said container, and resilient means in said housing reacting against said container to urge said container to a collapsed condition.

13. A male urinary incontinence device comprising an elongated tubing for fitting over the male organ, said tubing having an open proximal end and an open distal end, sealing means for receiving said male organ and substantially closing said open proximal end with the tip of the male organ protruding through said sealing means and extending into said tubing, said tubing being compressible and extensible to create a negative pressure therein upon compression thereof and subsequent extension, a urine collector, conveying means connecting said urine collector to said distal end of said tubing whereby urine may flow into said collector, said sealing means comprising a sheath disposed in said tubing, said sheath being open at both ends for snugly fitting on the male organ with the tip of the male organ extending beyond said sheath into said tubing, one of said open ends of said sheath being folded over said proximal end of said tubing to substantially close said proximal end, including pump means connected to said conveying means and to said collector for drawing the urine into said collector.

14. A device as set forth in claim 13 wherein said pump means comprises a thoracic pump which is adaptable to obtain its pumping action from the breathing of the user.

15. A device as set forth in claim 13 wherein said collector is disposed downstream from said pump means, a temporary collecting receptacle being upstream from said pump means, said conveying means being liquid conveying lines permitting a path for liquid flow from said tubing to said receptacle to said pump means to said collector, and sensing means between said receptacle and said pump means for controlling the pumping action of said pump means in accordance with the level of urine in said receptacle.

16. A device as set forth in claim 2 wherein said proximal end of said tubing includes a shoulder, said sheath having one of said open ends beaded for engagement be-

hind said shoulder, and said sheath having indicia adjacent the other of said open ends to act as guide means for selecting the diameter of said other open end of said sheath.

17. A tubing for use in a male urinary incontinence device, said tubing being elongated for fitting over the male organ, said tubing being made of a transparent material, said tubing being stiff yet flexible to permit bending thereof, said tubing having a proximal end and a distal end interconnected by a side wall, said proximal end being open, an external annular shoulder on said side wall adjacent said proximal end, said side wall incorporating an undulated bellows formation over a major part of its length whereby said tubing may be selectively compressed and extended, said side wall being of restricted cross-sectional area adjacent said distal end, said distal end being open to permit urine to flow therethrough, coupling means on said distal end for attachment to conveying means whereby the urine may be collected remote from said tubing, an elastic sheath being integrally connected at one end to said proximal end of said tubing and extending into said tubing alongside said bellows formation, and the other end of said sheath being open for receiving the male organ therein.

18. A collector for use in a male urinary incontinence device comprising a pouch, said pouch having a top wall and a bottom wall interconnected by side walls, said pouch being made of a flexible material, fastening means on said pouch for securement on the leg of a user whereby said pouch conforms to the leg of the user, a plurality of side by side compartments in said pouch extending from said bottom wall to said top wall, said compartments communicating with each other by a plurality of spaced openings between each pair of adjacent compartments, and coupling means in said top wall communicating with one of said compartments to permit urine to enter into and be collected in said pouch in such a manner that said compartments act as a baffle during the filling of said pouch with the urine, each of said compartments being substantially filled with absorbent material, and said coupling means including a block of self-sealing material which may be pierced by a hollow needle to permit the urine to flow therethrough.

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