

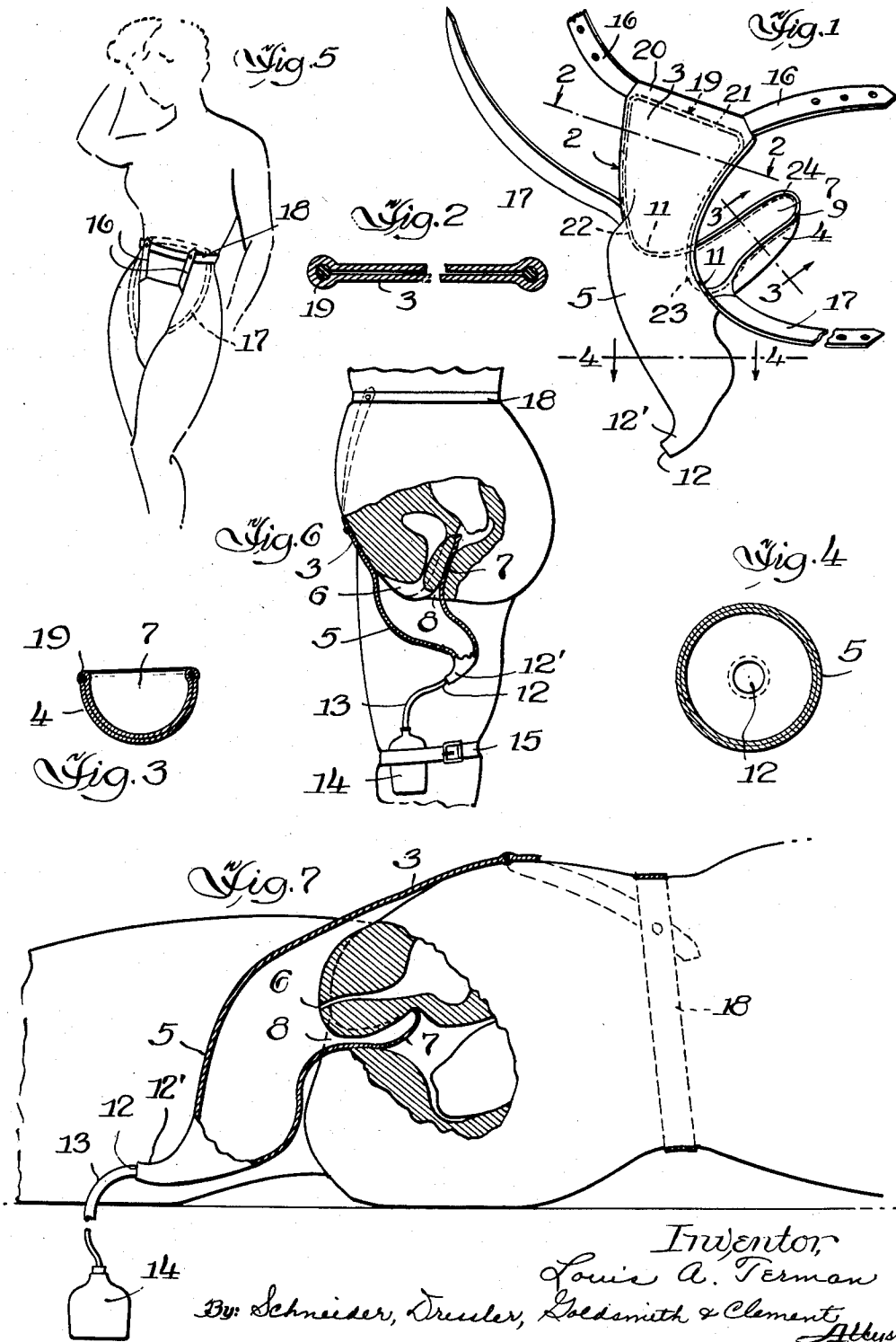
Jan. 7, 1964

L. A. TERMAN
INTRAVAGINAL URINAL

3,116,734

Filed June 7, 1961

2 Sheets-Sheet 1



Inventor,
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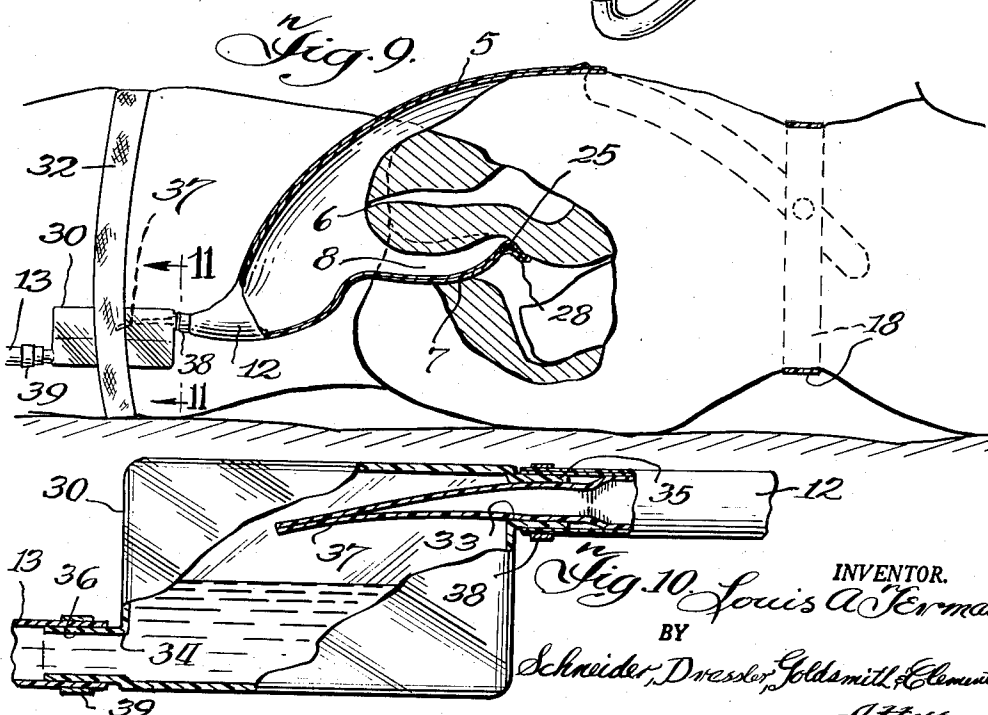
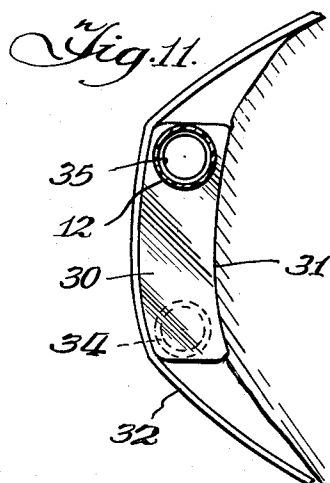
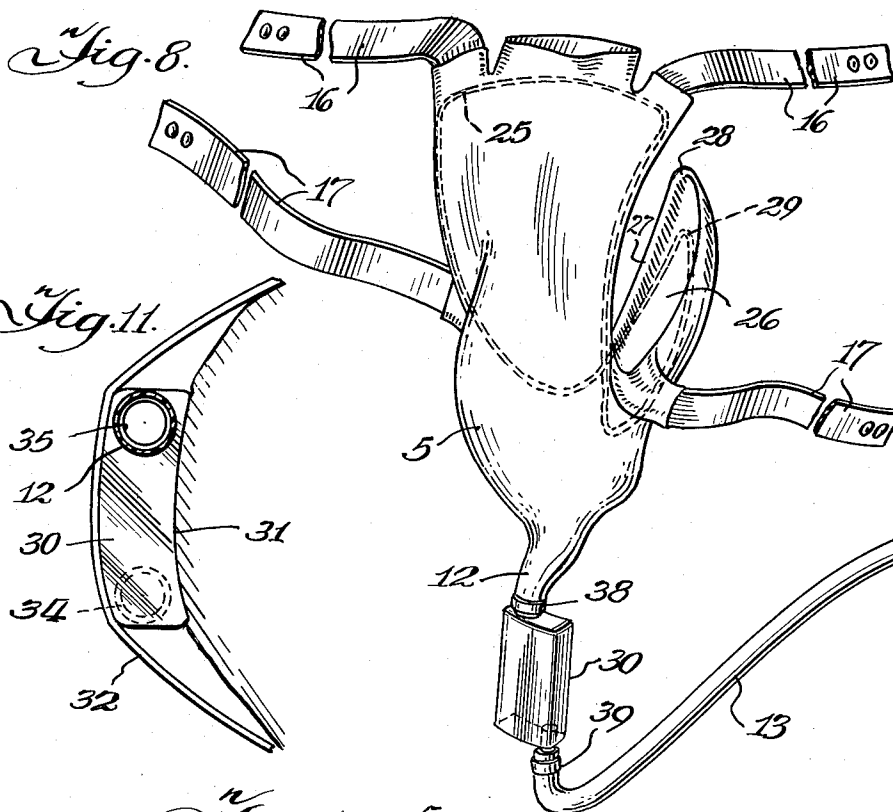
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INTRAVAGINAL URINAL

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Filed June 7, 1961, Ser. No. 115,363

7 Claims. (Cl. 128—295)

This invention relates to an intravaginal urinal adapted to be fitted to the body of incontinent female patients whether they are ambulatory or bedridden.

This application is a continuation-in-part of my prior copending application, Serial No. 28,594, filed May 12, 1960, now abandoned, which was a continuation-in-part of my prior copending application, Serial No. 763,258, filed September 25, 1958, now abandoned.

The involuntary flow of urine is extremely embarrassing to any woman having such a disability, and heretofore it has been customary to wear a pouch-like protective member made of rubber or other waterproof material adapted to retain the urine until the wearer has an opportunity to clean herself. Such protective members extend all the way across the patient's body between her legs, and in addition to bulkiness and discomfort have the disadvantage that areas that should not be exposed to urine for long periods, such as surrounding skin areas, rectal orifice, etc., are exposed to urine. Furthermore the odor emanating from such protective members is offensive to other persons.

The intravaginal urinal of the present invention is designed to conform to the anatomical configuration of a woman and is comfortable, being easily fitted to the body. It may be worn either by a bedridden or an ambulatory patient. Although the urinal comprises a single structural unit, it is divided functionally into three parts. The urinal comprises a front section, a receiving section, and a flexible bag comprising a discharge section. A tubular conduit leads from the discharge section to a receptacle for holding the urine until it can be emptied into a toilet. A secondary reservoir is interposed in the tubular conduit between the discharge section and the receptacle.

The front section is provided with straps extending therefrom and adapted to be detachably secured to a belt to hold it in snug surface contact with the wearer's body forwardly of the urethra. The front section may have straps permanently secured thereto, or may have projecting tabs to which straps are detachably secured. The straps are preferably made of flexible rubber to allow for movement of the body. The upper straps cooperate with the lower straps to hold the urinal in place. The lower straps are positioned to hold the intravaginal portion against the vulva so that it cannot be displaced by a cough or strain.

The receiving section is shaped and dimensioned for insertion into the vagina without covering the rectum. The patient may, therefore, defecate without removing the urinal. This feature is particularly important in cases wherein the wearer has involuntary defecation. The urinal is made of soft rubber that is incapable of hugging the wall of the vagina by itself. The use of soft rubber is desirable because rubber that is too hard or thick makes pressure areas on the bladder or cervix, with deleterious effects such as vesico-vaginal fistula or cervical irritation.

A one-piece wire frame in the form of a spring embedded in the urinal extends along the front section to hold the front section of the urinal against the wearer's body and along the sides of the receiving section to press the edges of the receiving section against the anterior wall of the vagina or the posterior wall of the bladder. The wire frame cooperates with the straps to hold the receiving section securely in place. The spring does not extend all the way to the end of the receiving section,

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but is spaced therefrom, and the extending portion of soft rubber makes it possible for the receiving section to fit properly within vaginas of different length. The resilience of the spring in the lateral direction enables the receiving section to fit properly within narrow or wide vaginas.

The receiving section is in the form of a trough having its entire top open and having a transverse curvature of more than 180°. This curvature enables the receiving section to fit snugly against the wearer's body under the lower end of the urethra whether the wearer is lying on her back or side, or is ambulatory. The depth of the trough eliminates any possibility of urine leaking between the upper edge of the urinal and the wearer's body.

The flexible bag has an open top, and its side walls converge toward the opposite end. A discharge opening is provided at the smaller end of the bag. The lower portion of the bag is so contoured as to provide for a continuous downward flow of urine discharged into the receiving trough from the trough to the discharge opening, whether the wearer is lying or standing. The sides of the one-piece wire frame embedded in the upper edge portion of the receiving section may be pressed toward each other, but cannot normally be pressed into abutting engagement to completely close the top of the receiving trough because of the lateral pull exerted against the upper edge portions of the receiving trough by the lower straps, when said lower straps are secured in position on the wearer's body. The trough is always open for the reception of urine, regardless of whether the woman wearing the urinal is lying or standing.

A flexible conduit leads from the discharge opening to a suitable receptacle. The conduit includes a flexible tube connected to the discharge opening, a secondary reservoir connected to the tube, a second tube extending from the reservoir, and a suitable receptacle detachably secured to the other end of the second tube. The receptacle is removed from the end of the tube when it is to be emptied into a toilet, and may be replaced without difficulty. No opening, other than the one by which the receptacle is secured to the end of the tube, is provided in the receptacle. A tight fit is provided between the end of the tube and the single opening in the receptacle to prevent leakage and also to prevent the escape of offensive odors from the urine collected in the receptacle. The capacity of the receptacle is large enough to receive urine without overflowing.

The secondary reservoir is provided to hold the urine in the event that the tubular conduit becomes temporarily blocked, as for instance, by a kink in the tube. The reservoir may have a cross section of any noncircular configuration, but preferably has a substantially rectangular cross section, with the wall adapted to be positioned against the surface of the wearer's leg curved slightly to conform generally to the transverse curvature of the leg. The noncircular cross section is desirable in order to prevent rotation or twisting of the reservoir. The inlet opening of the reservoir is preferably provided with suitable valve means to prevent backflow.

The urinal eliminates the need for any bulky pad and is very compact. When the urinal is worn, it is not noticeable through the clothing of the wearer because of its compactness and its close fit against the body of the wearer.

The structure by means of which the above mentioned and other advantages of the invention are attained will be described in the following specification, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of an intravaginal urinal embodying the invention;

FIG. 2 is a cross sectional view, taken along the line 2—2 of FIG. 1;

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FIG. 3 is a cross sectional view of the receiving trough, taken along the line 3—3 of FIG. 1;

FIG. 4 is a cross sectional view of the flexible bag, taken along line 4—4 of FIG. 1;

FIG. 5 is a perspective view showing the urinal being worn by an ambulatory patient;

FIG. 6 is a cross sectional view showing how the urinal fits the anatomical configuration of an ambulatory patient;

FIG. 7 is a cross sectional view showing how the urinal fits a bedridden patient;

FIG. 8 is a perspective view, similar to FIG. 1, showing another embodiment of the urinal;

FIG. 9 is a cross sectional view showing how the urinal and the secondary reservoir fit a bedridden patient;

FIG. 10 is a side view, partly in section and partly in elevation, showing the secondary reservoir and its inlet and outlet openings; and

FIG. 11 is a cross sectional view, taken along the line 11—11 of FIG. 9.

Referring to the drawings, FIG. 1 shows an intravaginal urinal comprising an integral body 2 that may be made of latex or any suitable flexible rubber or plastic material that can be washed and is impervious to urine. The body of the urinal comprises a front section 3, a receiving section 4 and a flexible bag 5. The front section is adapted to fit against the wearer's body forwardly of the urethra 6 with the edges of said front section providing a snug surface contact with the body.

Receiving section 4 has its longitudinally extending intermediate portion depending below its longitudinal edges to form a trough 7 having its entire top open. Trough 7 is so shaped and dimensioned that it may be inserted into vagina 8 without discomfort, and in such position will extend below the lower end of the urethra to receive the urine whenever it is discharged. The entering end 9 of trough 7 is closed in the form of a deep spoon that presses against the anterior wall of the vagina to provide added security for the urinal. The receiving section is preferably reinforced by means of a one-piece wire frame in the form of a spring embedded in the rubber and generally conforming to the shape of the upper edge of the trough.

The forward end of trough 7 and the lower end of front section 3 both merge into the upper edges of the flexible bag 5. The upper edge of trough 7 forwardly of the vagina, and the upper edge 11 of the flexible bag extending between the forward end of the trough and the lower end of front section 3 fit snugly against the wearer's body to prevent any leakage of urine through the joint between the urinal and the wearer's body. The transverse curvature of the trough is more than 180° to insure a snug fit of the upper edge of the trough against the wearer's body regardless of whether the wearer is lying or standing. The depth of the trough and the shape of the urinal insures prompt removal of the discharged urine into the receptacle without unnecessary contact of the urine with surrounding skin areas, thus avoiding skin irritation and eliminating an necessity for frequent changes of underwear. The upper edge of the flexible bag and the front section extending upwardly from the flexible bag are shaped to conform to the vertical curvature of a woman's body forwardly of the urethra.

The rear wall of the flexible bag extends downwardly at an angle of approximately 120° from the receiving section. This angular relationship between the receiving section and the rear wall of the flexible bag is critical within a few degrees because it provides a continuous downwardly extending passageway for all urine dropping into the receiving trough 7 when the receiving section is positioned in the vagina, regardless of whether the wearer is lying or standing. The angular relationship between the receiving section and the rear wall of the flexible bag also causes all portions of the rear wall of the flexible bag to be disposed at a lower level than the open end of the urethra, whether the wearer is lying or standing.

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The walls of the trough and the flexible bag are smooth, and are shaped to eliminate any possibility of forming pockets in which urine may collect.

The lower end of flexible bag 5 has a discharge opening 12 extending through its lower end. The end of the flexible bag contiguous to the discharge opening is preferably curved forwardly, as indicated at 12', so that it will lie parallel to the bed of a bedridden wearer. A flexible tube 13 has one end secured to the discharge opening. The forward curvature of discharge opening 12 makes it easier for tube 13 to lie on the bed when the urinal is worn in lying position. Tube 13 may be secured to the discharge opening in any suitable manner, but is preferably permanently secured thereto. A receptacle 14 is detachably secured to the other end of the flexible tube. Receptacle 14 is completely closed except for the single opening by which it is secured to tube 13. The detachable securement of receptacle 14 to tube 13 permits the receptacle to be readily removed and replaced so that it may be emptied into any convenient toilet. The receptacle may also be washed to remove offensive odors.

In ambulatory cases, receptacle 14 is preferably held against the inner side of the wearer's leg by a suitable strap 15. In such cases the receptacle is preferably flat, because a flat receptacle will not interfere with the wearer's normal walk, and also because it is not conspicuous when it is secured against the inner side of the leg. In cases where the urinal is worn by a bedridden patient, the receptacle may stand on the floor or may be secured to the bed. In either case the receptacle is provided with a narrow neck, and the tube secured to said neck provides an effective closure that prevents escape of offensive odors from the receptacle.

The urinal is preferably provided with a pair of upper straps 16 extending upwardly from the outer top edges of front section 3 and a second pair of lower straps 17 extending outwardly from the upper edge of the flexible bag 5. The straps may be integral with the urinal, or may be secured thereto in any suitable manner. The straps are preferably detachably secured at their free ends to a belt 18 extending around the waist of the wearer. It will be understood that any desirable strap arrangement may be used. The straps cooperate with the receiving section to hold the urinal against the wearer's body and to provide a snug surface contact completely surrounding the lower end of the urethra without obstructing the rectal orifice. The absence of any covering over the rectal orifice makes it unnecessary to remove the urinal every time the wearer has to defecate.

In the embodiment of the invention illustrated in FIGS. 1 to 7 of the drawings, the urinal is provided with a one-piece wire frame 19 extending around the outer edges of the front section and the receiving section. In this embodiment, the urinal is preferably made of a doubled sheet of latex of any suitable flexible rubber or plastic material having the upper end of the front section open. The frame, comprising a closed loop of light spring wire is preferably coated or dipped in latex to provide a cushioning effect so that the wire will not be felt by the wearer. The frame is inserted through the open upper end of front section 3, and the upper edges of said front section are then bonded or sealed together in any suitable manner to completely enclose frame 19, preferably with a flexible edge 20 projecting beyond the end of the frame.

Frame 19 comprises a front end 21, sides 22 and 23 converging toward the rear from the outer edges of said front end, and a rear end 24 joining said sides. The sides of the frame are bent intermediate their ends at an angle of approximately 50° to make the frame conform to the vertical curvature of a woman's body forwardly of the urethra. The slight rearward curvature of the front section 3 causes it to press against the wearer's body when receiving section 4 is inserted in the vagina. The flexibility of the wire frame permits the angularity of its sides to change when the receiving section is inserted if a change

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in such angularity is necessary in order for the urinal to fit snugly against the wearer's body because of differences in shape of the wearer's body. The rear end 24 of frame 19 is sufficiently narrow to permit insertion of the receiving section 4 into a comparatively narrow vagina without discomfort. The wire frame may be compressed laterally if it is too wide for the vagina, but the lower straps 17 exert sufficient lateral pull against the sides of the trough to prevent the open top of the trough from being completely closed by lateral compression of the wire frame as the trough is inserted into the vagina.

The trough of the receiving section extends under the lower end of the urethra, whether the wearer is bedridden or ambulatory, and extends downwardly from the end that enters the vagina, so that any urine discharged drops into the trough and flows directly into the flexible bag. The flexible bag also extends downwardly, with the discharge opening at its lowermost end, to cause the urine to flow through the flexible bag and the tubular conduit into the receptacle provided for it. The bottom of the trough and the rear wall of the flexible bag extend downwardly in a continuous downwardly extending smooth curve. The smoothness of the downward curve prevents the formation of any pockets that might hold some of the urine flowing through the trough or the flexible bag.

The embodiment of the invention illustrated in FIGS. 8 to 11 is similar to the embodiment of FIGS. 1 to 7 and the description of identical structure will not be repeated.

The wire frame 25 shown in FIG. 8 is spaced from the edges of the trough 26 to provide a marginal extension 27 of soft rubber at each side of the trough and a marginal extension 28 extending rearwardly of the rear end 29 of the wire frame. The wire frame is resilient and may be easily compressed by the parts of the wearer's body contacting the adjacent portions of the trough to provide a snug fit, without exerting enough pressure against the walls of the vagina to cause irritation. If the vagina is too short to receive the trough, the marginal extension 28 at the entering end of the trough is pushed back toward the end 29 of the wire frame. If the vagina is longer than the portion of the wire frame embedded in the trough, the wire frame will provide sufficient reinforcement for the trough to enter far enough to insure proper operation of the urinal, and, as seen in FIG. 9, the marginal extension 28 abuts against the anterior wall of the vagina to provide additional security against leakage over the upper edge of the urinal. The flexibility of the wire frame permits the trough to contact the lateral walls of the vagina as well as the anterior walls thereof.

In the embodiment of FIGS. 8 to 11 a secondary reservoir 30 is interposed between discharge opening 12 and the tube 13 which leads to the receptacle 14. The reservoir 30 may have a cross section of any desired noncircular configuration, but the preferred cross section is substantially rectangular with a slight curvature on one side, as indicated at 31, to facilitate fitting the reservoir in engagement with the wearer's leg. The reservoir is secured to the wearer's leg by a strap 32. The reservoir is a safety feature, the main purpose of which is to prevent backflow of urine in the event that receptacle 14 is completely filled or tube 13 is kinked and prevents flow of urine into the receptacle.

Reservoir 30 has an opening 33 at one end and an opening 34 at its opposite end. Openings 33 and 34 are preferably offset and the reservoir is arranged with the inlet, opening 33 in FIG. 10, at a higher level than the outlet, to prevent backflow. The offset arrangement of the inlet and outlet openings enables the urine discharged into trough 26 to flow directly from discharge opening 12 through reservoir 30 and into tube 13, whenever the flow passageway is not blocked, regardless of whether the woman wearing the urinal is standing or lying. The receptacle 30 can always be arranged to provide for downward flow from the inlet opening 33 to the outlet open-

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ing 34. Tubular extensions 35 and 36, extending outwardly from openings 33 and 34, respectively, facilitate securement of the reservoir to discharge opening 12 and tube 13. A flutter valve 37 secured within discharge opening 12 and projecting outwardly from the discharge opening extends through tubular extension 35 and opening 33 into the reservoir. The end of discharge opening 12 is secured to extension 35 by any suitable clamp or strap 38. A similar clamp or strap 39 secures tube 13 to extension 36.

Although I have described two preferred embodiments of the invention in considerable detail, it will be understood that the description is intended to be illustrative, rather than restrictive, as many details may be modified or changed without departing from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact structure described.

I claim:

1. A urinal adapted to be worn by a woman, said urinal comprising a flexible bag and a receiving section, the lower edge of said receiving section merging with the upper edge of said bag, said flexible bag having a discharge opening in its bottom, a resilient frame embedded in the longitudinal edge portions of said receiving section, said receiving section and embedded frame extending into the wearer's vagina, said receiving section comprising a trough having its entire top open, said trough extending under the lower end of the urethra, strap means extending from said urinal and holding the urinal in sealing engagement with the wearer's body along a line surrounding the lower end of the urethra, whereby urine discharged through the urethra flows through said trough, flexible bag and discharge opening.

2. A urinal adapted to be worn by a woman, said urinal comprising a front section, a receiving section, and a flexible bag, a resilient frame having a portion thereof embedded in said front section and a portion thereof embedded in said receiving section, the portion of said frame embedded in said front section being shaped to conform to the vertical curvature of a woman's body forwardly of the urethra and adapted to press said front section against the wearer's body, said receiving section comprising a trough having its entire top open, said trough fitting into the vagina and extending below the lower end of the urethra, said trough being inclined downwardly and merging into the upper end of said flexible bag, said flexible bag having a discharge opening at its lower end.

3. In a urinal adapted to be worn by a woman, a receiving section adapted to extend into the vagina, said receiving section being in the form of a trough having its entire top open, and a resilient frame embedded in the walls of said trough, said frame being spaced from the edges of said trough to enable said trough to fit within vaginas of different sizes, said trough engaging the anterior wall of the vagina to help hold said urinal in place.

4. In a urinal adapted to be worn by a woman, a receiving section adapted to fit into the wearer's vagina with one end below the lower end of the urethra whether the wearer is standing or lying, said receiving section having its entire top open, a resilient frame embedded in the walls of said receiving section, said frame being compressible laterally to enable said receiving section to fit in vaginas of different widths, and a pair of straps secured to said urinal to help secure said urinal in position on a woman's body, said straps being so positioned relative to said receiving section as to exert a lateral pull on said receiving section when said straps are secured to a support above said urinal, said lateral pull preventing complete closing of the top of said receiving section.

5. In a urinal adapted to be worn by a woman, a receiving section adapted for insertion into the wearer's vagina, said receiving section being adapted to extend under the lower end of the urethra and leave the rectal orifice unobstructed when it is inserted into the vagina, and a resilient frame embedded in the walls of said re-

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ceiving section, said frame being spaced from the outer edges of said receiving section to enable said receiving section to fit in vaginas of different sizes.

6. A urinal adapted to be worn by a woman, said urinal comprising a frame having a coiled wire core shaped to fit against the surface of a woman's body surrounding the lower end of the urethra while leaving the rectal orifice unobstructed, said frame having a portion thereof adapted to extend into the vagina, a strap secured to said frame and extending around the body of the wearer to hold said frame in said position, a flexible bag depending from said frame, said frame being completely embedded in the material of the bag adjacent the upper edge portions of said bag, said bag having an opening in its bottom, and a receptacle connected to said bag in alignment with said opening.

7. In a urinal adapted to be worn by a woman, a flexible frame shaped to fit against the surface of a woman's body surrounding the lower end of the urethra, said frame comprising a front section, a pair of side sections extending rearwardly from opposite ends of said front section, and a rear section connecting the rear ends of said side sections, said rear section being adapted to extend into the vagina, a strap secured to said side sections and adapted to cooperate with said rear section to form a flexible seal

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extending continuously around the lower end of the urethra and leaving the rectal orifice unobstructed whether the wearer is lying or is in upright position, a flexible bag depending from said frame, said bag having an opening in its bottom, a tube connected to said bag in alignment with said opening, and a receptacle detachably secured to said tube, whereby urine discharged through the urethra is collected in said receptacle.

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