United States Patent

Ericson

[15] **3,650,272**

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[54] DRAINAGE BAG

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[21] Appl. No.: **75,506**

[52] **U.S. Cl.** **128/275**, 4/110

[51] **Int. Cl.** **A61f 5/44**

[58] **Field of Search** 128/DIG. 24, 275, 294, 295; 4/110

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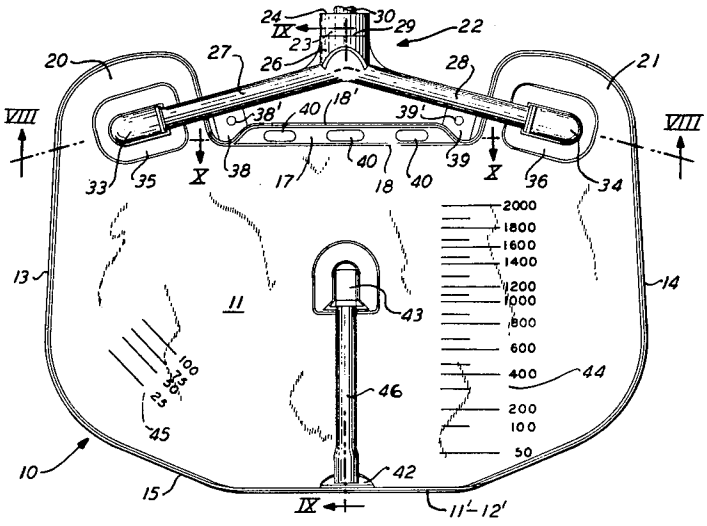
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[57] **ABSTRACT**

A closed system urine collection bag having a rigid combined drip chamber and bifurcated inlet tubes having their ends communicating with the bag adjacent opposite upper corners thereof and firmly secured thereto, thereby acting as a spreader to stabilize the form of the bag, the drip chamber and tubes constituting a carrying handle, and the medial upper edge of the bag being further stabilized by a rigid bar extending horizontally between spaced points of fixation to the inlet tubes.

9 Claims, 10 Drawing Figures



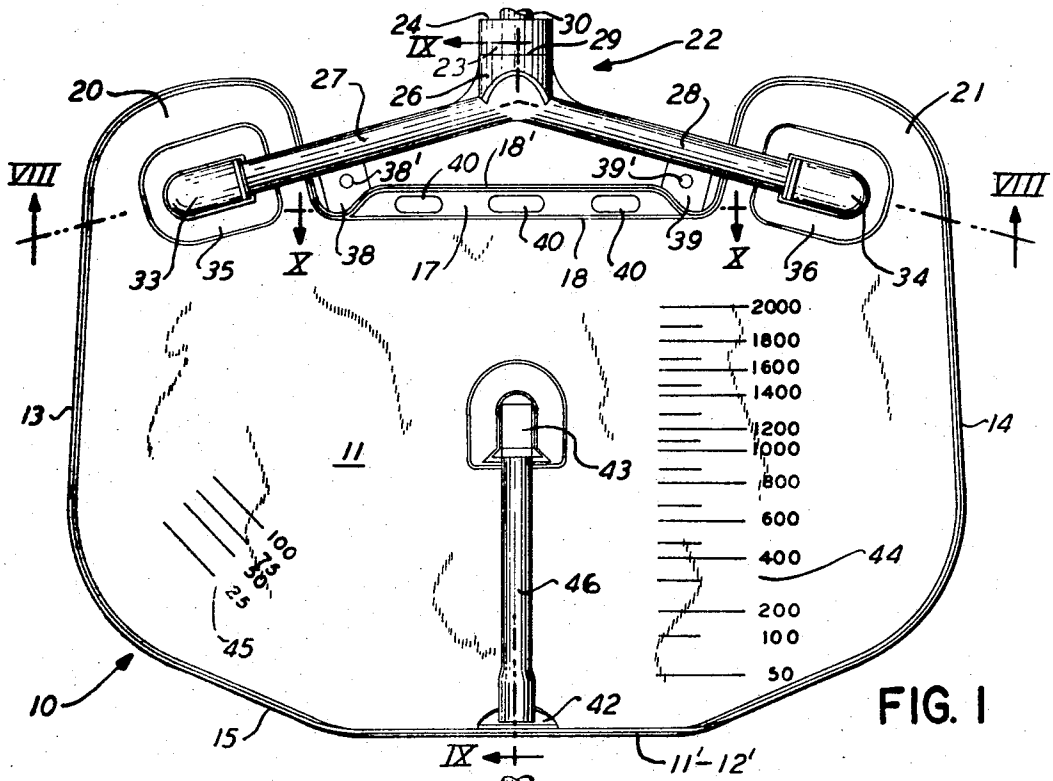


FIG. 1

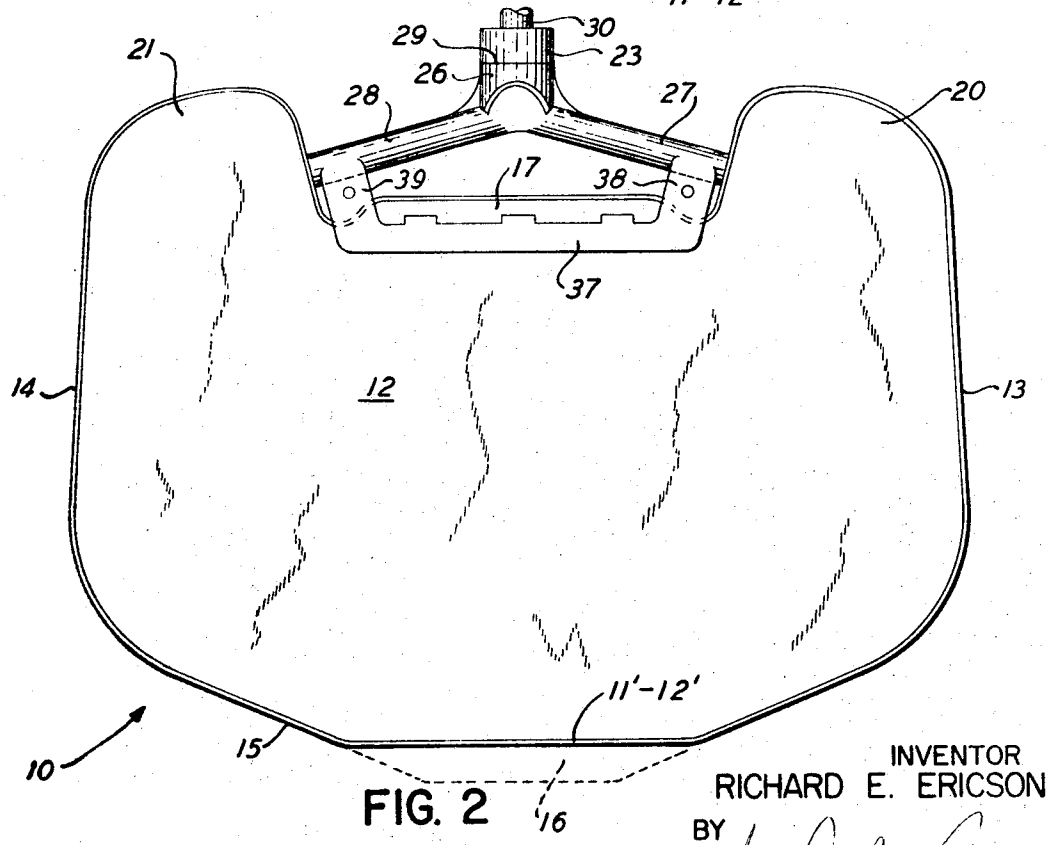


FIG. 2

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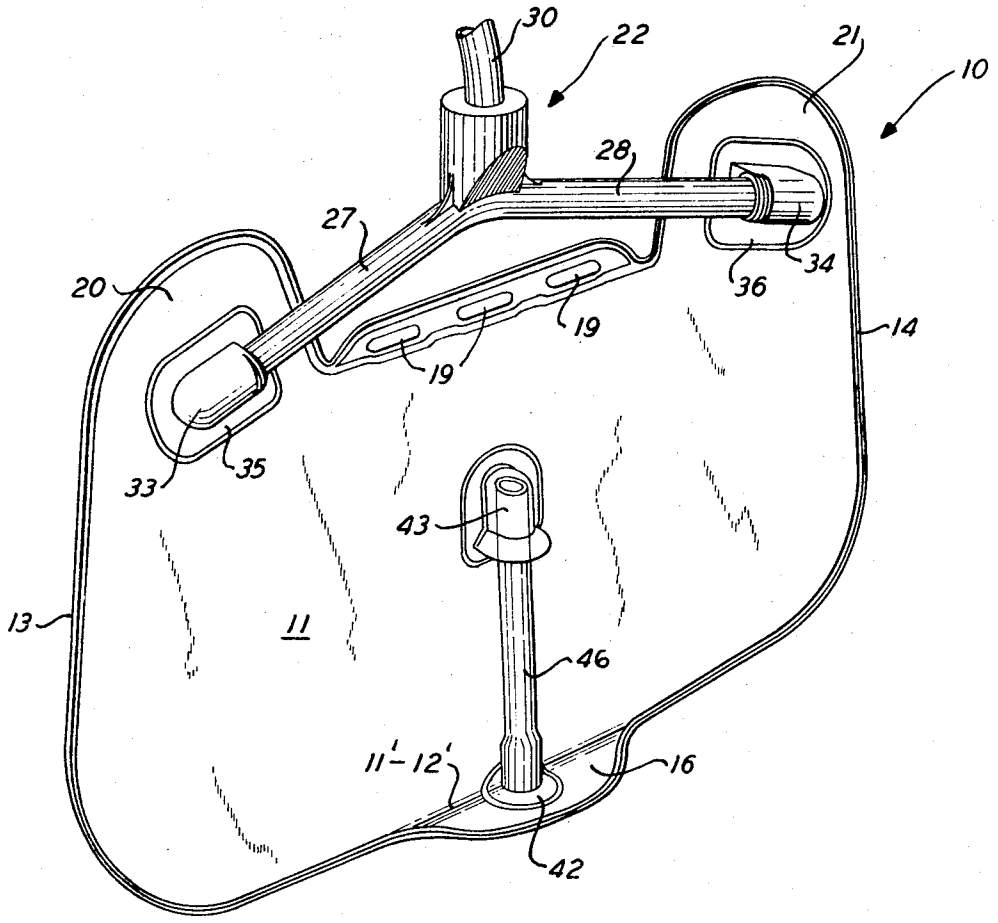


FIG. 3

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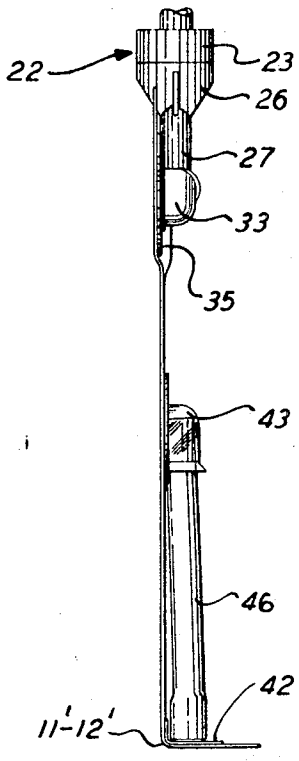


FIG. 4

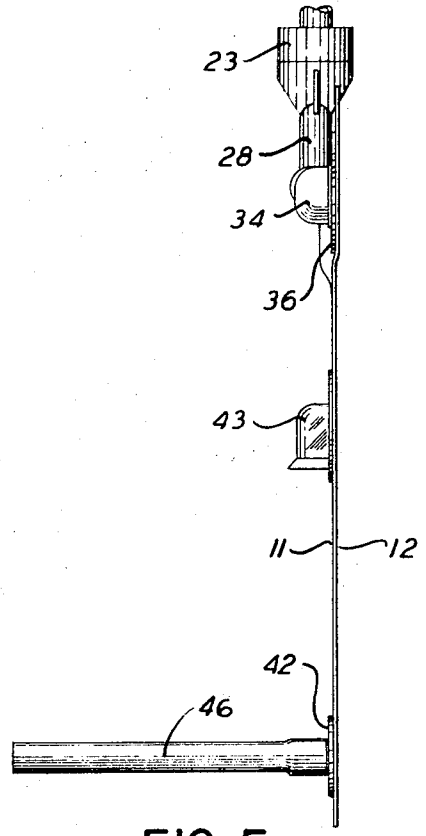


FIG. 5

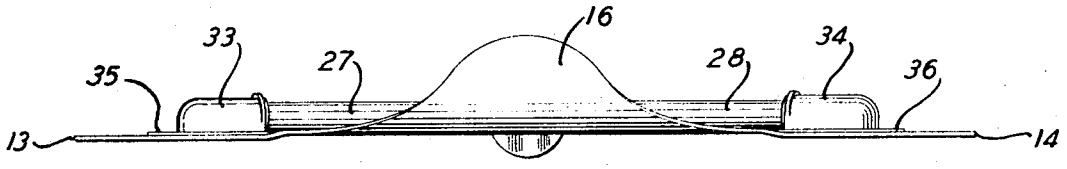


FIG. 6

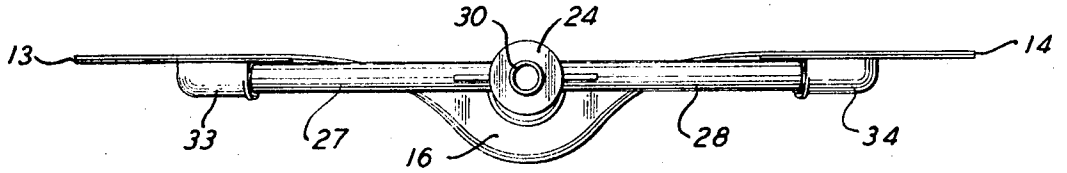


FIG. 7

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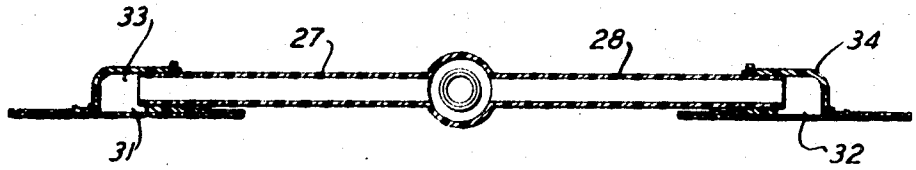


FIG. 8

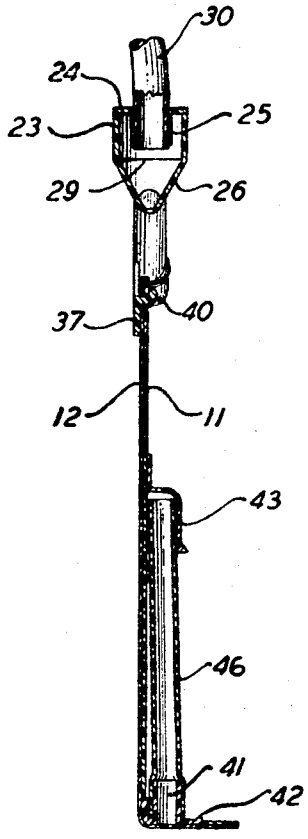


FIG. 9

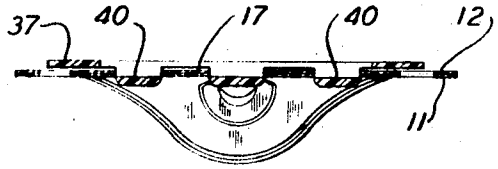


FIG. 10

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DRAINAGE BAG

This invention relates to the drip chamber and collection bag portion of a closed urinary drainage system, the remaining elements of such a system (i.e., the catheter and drainage tube) being of any normal and suitable type.

It is an object of the invention to provide an inlet assembly which is rigid, and which includes a drip chamber from the base of which integral inlet tubes extend laterally to points adjacent to, but spaced from, the upper corners of a flat bag, the inlet assembly constituting a carrying handle.

It is a further object to provide such a bag in which the wet path, along which bacteria could migrate, is not only interrupted at the drip chamber but is extended and tortuous between the drip chamber and the liquid level in the bag, to further discourage the communication of infection back to the patient.

It is another object to provide a drainage bag of exceptional strength and durability, yet of such simplicity that it is inexpensive to make and is fully disposable after a normal term of use by a single patient.

A practical embodiment of the invention is shown in the accompanying drawings, wherein:

FIG. 1 represents a front elevation of the bag;

FIG. 2 represents a rear elevation of the bag;

FIG. 3 represents a front perspective view of a modified form of bag;

FIG. 4 represents a side elevation of the bag with the outlet tube in closed position;

FIG. 5 represents a side elevation, opposite from FIG. 4, and with the outlet tube in open position;

FIG. 6 represents a bottom plan view of the bag as shown in FIG. 4;

FIG. 7 represents a top plan view of the bag as shown in FIG. 4;

FIG. 8 represents a section on the line VIII—VIII of FIG. 1;

FIG. 9 represents a vertical section on the line IX—IX of FIG. 1; and

FIG. 10 represents a detail horizontal section on the line X—X of FIG. 1.

Referring to the drawings, the bag **10** is constituted by complementary front and back walls **11**, **12** of plastic sheets, at least one of which is preferably transparent to permit ready observation of the liquid level in the bag. The inner surface of at least one wall is preferably roughened, as by calendering the surface or embossing the sheet, to ensure separation of the walls as liquid enters the bag. In the form shown, the bag has a wide somewhat kidney-shaped outline, the sheets being sealed together around their entire peripheries. The opposite side edges **13**, **14** are substantially vertical or sloped slightly inward while the profile of the bottom edge **15** is convex downwardly to form a sump portion **16** in certain bag positions, as later explained. The middle upper edge is horizontal and provided with a narrow tab **17** between seal lines **18'** and **18**, the tab having spaced elongated perforations **19** for engagement with a support bar. Each upper corner of the bag extends upward to form ears **20**, **21**.

The liquid inlet assembly comprises a cylindrical drip chamber **22** conveniently made in two parts, the upper part **23** being cylindrical with a top wall **24** traversed by the downwardly extending inlet sleeve **25**, and the lower part **26** being tapered (FIG. 9) and formed integrally with the laterally and downwardly extending inlet tubes **27**, **28**. The parts **23**, **26** are securely cemented together at **29** and a flexible drainage tube **30** is cemented in the sleeve **25** centrally of the compartment formed by the parts **23**, **26** to constitute a drip chamber, adapted most effectively to interrupt the liquid path from the bag to the drainage tube. For a further discussion of the function of a drip chamber in a closed system, see applicant's U.S. Pat. No. 3,343,542.

In each of the ears **20**, **21**, there is an opening **31**, **32** and side spouts **33**, **34** are affixed to the front wall **11** by means of the flat base portions **35**, **36**, so disposed that the spout openings are alined with the tubes **27**, **28**, the ends of which are inserted in and cemented to the respective spouts.

While the tubes **27**, **28** are rigid and their attachment to the spouts **33**, **34** and ears **20**, **21** is secure enough to support the bag without more, as indicated in FIG. 3, it is preferable to add the flat rigid support bar **37** (FIG. 2) which extends horizontally adjacent the tab **17**, is connected integrally at its ends to the tubes **27**, **28** through extensions **38**, **39**, and is provided with elongated projections **40** of a size and location such as to engage tightly in the perforations **19**. The extensions **38**, **39** may conveniently be provided with holes **38'**, **39'** for cooperation with certain types of bag hangers.

For emptying the bag, there is provided a drawoff tube **46** mounted on a spout **41** which communicates with the bag interior through the wall **11** in the region of the sump **16**. The spout **41** extends perpendicularly from the annular base **42** cemented to the wall **11**. In its non-draining (closed) position, the free end of the tube **40** is snugly housed in the downwardly open pocket **43**, which is fixed on the front wall **11** of the bag at a point directly above the sump **16**. When the tube **40** is turned up to the closed position, it turns the spout **41**, base **42** and sump portion **16** of the bag through 90° around a horizontal fold line **11'–12'**, thus tending to close off the sump from communication with the remaining interior of the bag. This closing tendency disappears when the drawoff tube **40** is lowered to or below the emptying position shown in FIG. 5, and the bag can be emptied and reclosed without interruption of its functioning as part of a closed drainage system.

In use, the tube **30** is normally connected to a catheter having its distal end retained in a body cavity, particularly the bladder. The tube **30** is initially capped in a customary manner, and the drawoff tube **40** is in closed position, so that the system can be supplied with its interior sterile and adapted to be kept closed during operation. Undesirable suction effects in the descending drainage tube can be most simply avoided by using a tube which has a large enough internal diameter (e.g., one-half inch or more) to allow free flow of liquid without formation of a "hung-up" column or slugs.

As actually constructed, this bag has a maximum capacity of 2,000 cc. as indicated by the scale **44**. The wide shape of the bag is such that a lower corner can be provided with a supplementary scale **45** for fine measurement up to 100 cc. by tipping the bag sidewise about 45°.

What is claimed is:

1. A urine collection bag for operative association with a drainage tube, comprising front and back flexible plastic walls peripherally sealed together to form a closed receptacle, inlets extending through one of said walls at horizontally spaced points adjacent the upper edge of the bag, relatively stiff inlet tubes extending from said inlets to a point midway between and higher than said inlets and a chamber at said last named point integral with and in communication with each said inlet tube and with a drainage tube.

2. A bag according to claim **1** wherein the upper edge of the bag includes a middle straight horizontal portion and upwardly extending corner portions, each inlet extending through the bag wall substantially in one of said corner portions.

3. A bag according to claim **2** wherein said straight portion is spaced below said inlet tubes and chamber sufficiently to permit said tubes and chamber to be used as a carrying handle.

4. A bag according to claim **2** which includes a support bar having its ends connected to said tubes, respectively, and being provided with means for engaging the bag adjacent said straight portion at one or more points.

5. A bag according to claim **1** wherein the lower edge of the bag has a downwardly convex profile, the middle portion being adapted to constitute a sump, and which includes outlet means associated with said sump.

6. A bag according to claim **5** wherein the outlet means includes a drawoff tube having one end fixed to a wall of the bag and movable from a closed position wherein the walls of the bag are folded adjacent the sump to an open position wherein said walls are unfolded and the bag contents can flow out through said drawoff tube.

7. A bag according to claim 6 which includes means for releasably holding the drawoff tube in its closed position.

8. A bag according to claim 6 wherein the drawoff tube is fixed to said bag wall by means of an annular base attached to the wall and a tubular spout projecting from said base at substantially a right angle.

9. A bag according to claim 6 wherein the point of fixation of the drawoff tube is so spaced from the lowest part of the lower edge that the wall fold line in closed position has a length less than half the width of the bag.

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