

[72] Inventors **Robert T. Skyles**
Glenview;
David L. Quinn, Libertyville; Leonard F.
Waldman, Niles, Illinois

[21] Appl. No. **644,540**

[22] Filed **June 8, 1967**

[45] Patented **Nov. 3, 1970**

[73] Assignee **Baxter Laboratories, Inc.,**
Morton Grove, Illinois
a corporation of Delaware

[56]

References Cited

UNITED STATES PATENTS

2,260,008	10/1941	Deshayes.....	150/9
2,863,453	12/1958	Gewecke.....	128/227
3,186,410	6/1965	Buono.....	128/275
3,263,848	8/1966	Zackheim.....	128/(Bag Digest)
3,307,549	3/1967	Zackheim.....	128/(Bag Digest)
3,312,221	4/1967	Overment.....	128/275
3,332,422	7/1967	Jinkens et al.	128/275

Primary Examiner—Charles F. Rosenbaum

Attorneys—Robert G. Pollock and Richard J. Reilly

[54] **DRAINAGE APPARATUS**
6 Claims, 5 Drawing Figs.

[52] U.S. Cl..... **128/275,**
150/0.5, 229/55

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

[50] Field of Search..... **128/226,**
227, 275, 276, 295, (Bag Digest); 150/0.5, 1, 2.5, 9;
229/55

ABSTRACT: An outlet tube for emptying a bag for fluids draining from a patient is turnable upwardly to cut off flow from the bag, and has an upstream end which is releasably retainable in a downwardly opening socket whose upper end is secured to an upper portion of said bag for retention of the tube in such turned condition. A portion of the bag adjacent the tube is nondistendable to preclude separation of the tube from the socket by pressure from the bag as it distends because of collection of drain fluids.

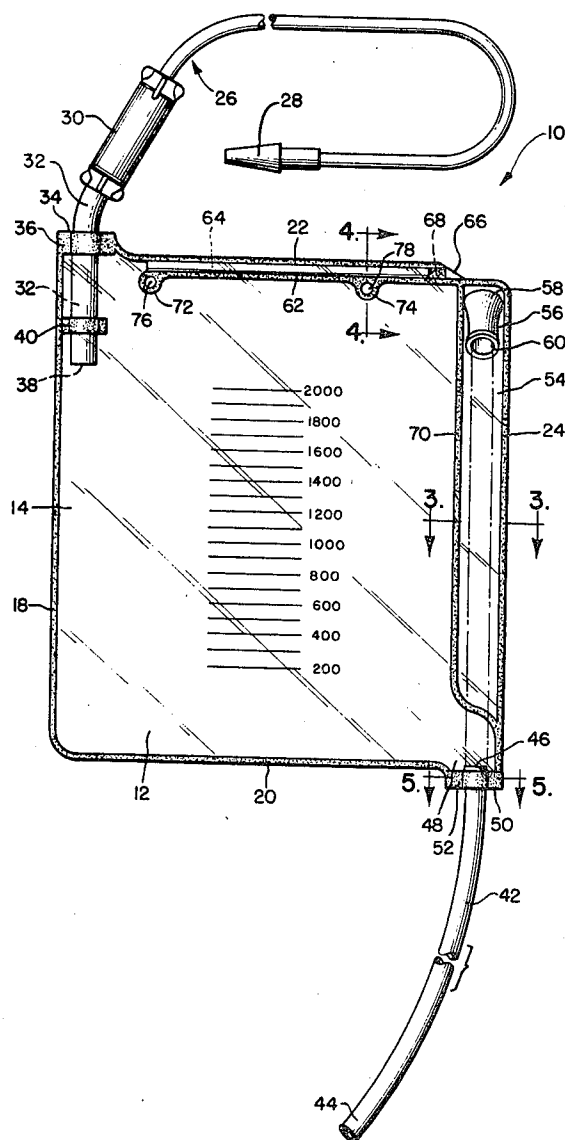


FIG. 1

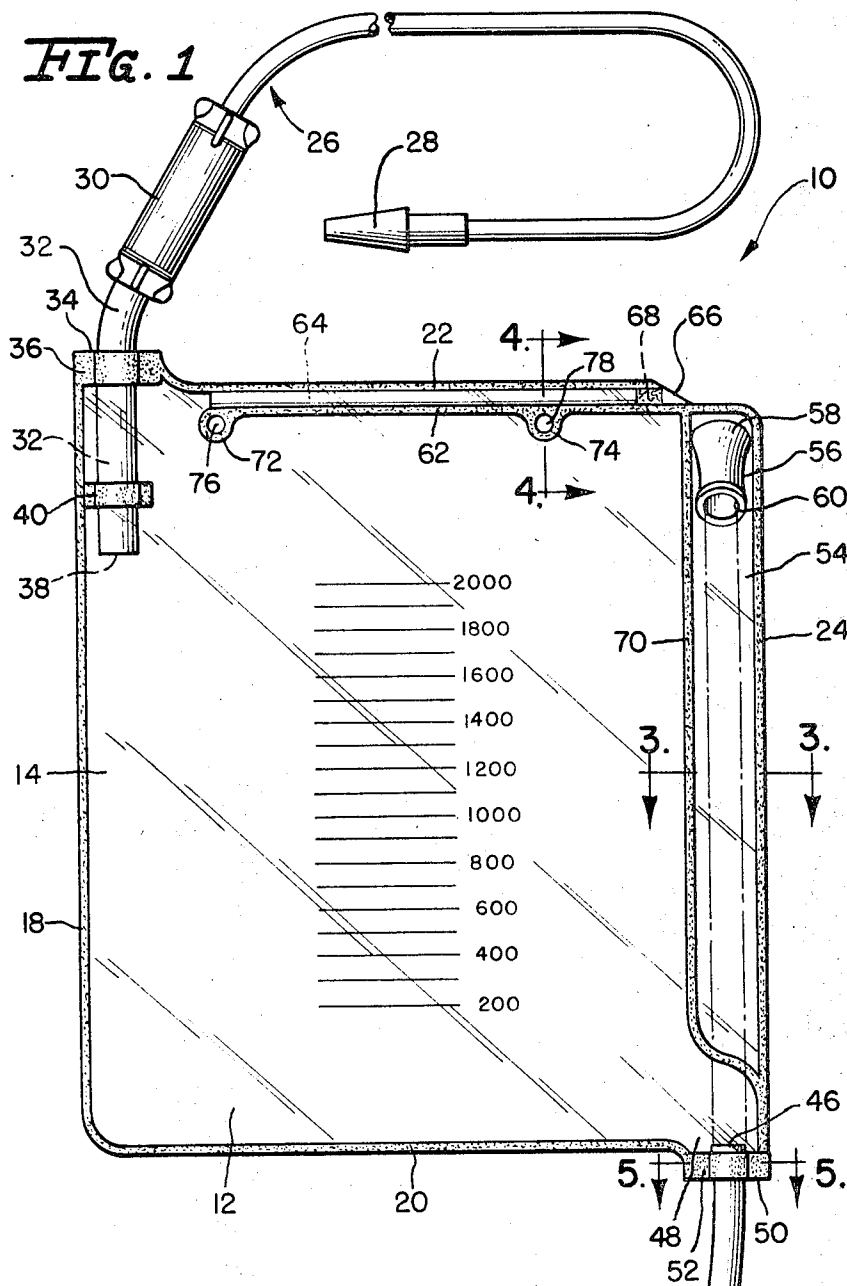


FIG. 2

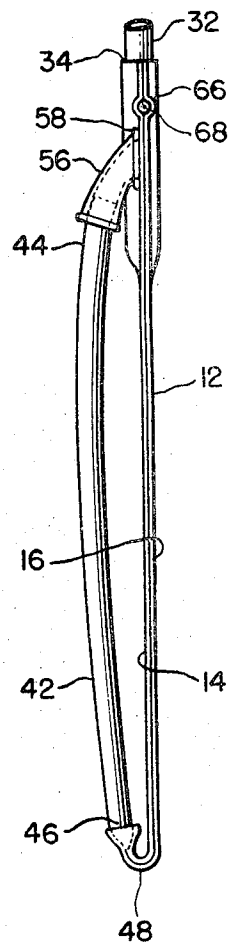


FIG. 3



FIG. 4

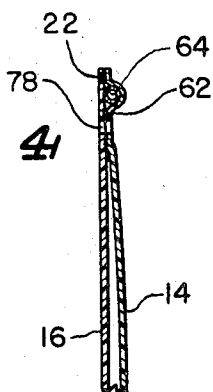
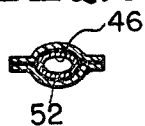


FIG. 5



Inventors
Robert T. Skyles
David L. Quinn
Leonard F. Waldman

By *Richard J. Hickey*
Attorney

DRAINAGE APPARATUS

The present invention relates to apparatus for handling fluids draining from a patient. Particularly it relates to drainage apparatus having a vented bag for continuously receiving fluids draining from a patient and means for emptying said bag at selected intervals.

Such apparatus typically may remove urinary fluids by connection with a catheter which is inserted in the body of a patient, and conventionally may have either of two types of means for bag emptying. A first type requires disconnection of a bag from an associated catheter. A second type of emptying means utilizes a manually operated flow control valve in an outlet tube from a bag. Although means of the first type of apparatus eliminates the valve cost, such saving is offset by increased cost of handling each time a bag is emptied. Moreover, each time an apparatus with the first type of means is emptied, there is a high risk of infection to the patient because of the accompanying requirement for catheter handling or exposure.

Furthermore, complicated bag venting mechanisms associated with prior apparatus having both types of emptying means adversely affect not only apparatus costs but also the risk of contamination.

It is an object of the present invention to provide improved drainage apparatus of the class described.

It is another object of the invention that said apparatus, at minimal cost, be adapted for continuous removal of fluids draining from a patient but for emptying such fluids at selected intervals under conditions which minimize the risk of infection to a patient.

It is a further object of the invention to provide improved venting means for said apparatus.

Features of apparatus according to the invention and by which the foregoing objects are achieved include a distendable bag which has fluid inlet means for establishing fluid communication between the bag and a patient. The bag has a lower outlet section which is collapsible and bendable, and functions as a valve for cutting off flow from the bag when bent. An upstream portion of a manually controllable outlet tube, which has a downstream end portion in fluid communication with said bag, is secured in the outlet section for turning the tube between a first aspect, when the outlet extension is unbent for drainage of fluid from the bag, and a second aspect when the outlet extension is bent for stopping flow from said bag. Retainer means is secured to an upper end of the bag, and has a downwardly opening socket for releasably receiving and holding the downstream end of the tube for holding the latter in its second aspect and permitting the bag to fill. To preclude removal of the tube from the retainer because of pressure from distension of the bag as it fills, a section of the bag over which the tube extends when conditioned in the second aspect is sealed to obviate filling of such section. A duct formed by a heat seal across the top of the bag provides for a vent which is spaced from the position of entry of fluid draining into the bag to further minimize contamination.

The foregoing and other objects, features, and advantages of the present invention will become more apparent upon consideration of the following description and appended claims, when considered in conjunction with the accompanying drawings wherein the same reference character or numeral refers to like or corresponding parts throughout the several views.

On the drawings:

FIG. 1 is an elevational view of apparatus embodying the invention and showing a bag with an outlet tube in a first aspect for emptying the bag, the position of the outlet tube in a second aspect being shown in phantom;

FIG. 2 is an elevational view looking toward the right side of FIG. 1 but showing the drain tube in the second aspect;

FIG. 3 is a sectional view on the line 3-3 of FIG. 1;

FIG. 4 is a sectional view on the line 4-4 of FIG. 1; and

FIG. 5 is a sectional view on the line 5-5 of FIG. 1.

Referring now more particularly to the drawings, exemplary drainage apparatus generally designated 10 is adapted for

removal of urine draining from a patient. It comprises a bag 12 fabricated from heat sealable front and rear plastic panels 14 and 16, the former of which may be transparent so that the level of liquid in the bag may be compared with a volumetric scale printed or otherwise impressed thereon. Bag 12 is distendable, and is formed by securance of panels 14 and 16 along sides and ends by heat seals as follows: Along the left side, a perfect seal 18; along the lower end, an imperfect seal 20; along the top end, an imperfect seal 22, and along the right side, a perfect seal 24.

A preferably plastic transparent fluid inlet tube generally designated 26 may be constructed in accordance with U.S. Pat. No. 3,100,490, issued to R.E. Desautels, Aug. 13, 1963, to provide a catheter adapter 28 for connection of apparatus 10 to a catheter (not shown), a medial drip chamber 30 which serves as a barrier to bacteria, and a discharge end portion 32. End portion 32 extends through and is secured by a fluid tight heat seal 36 in an upper opening 34 formed in the upper left end section of bag 12 between panels 14 and 16 as a consequence of omission of seal 22 which terminates short of seal 18. Discharge end portion 32 is also secured within said bag by a heat seal 40 so that its discharge opening 38 is disposed in spaced relation with the top of bag 12. Tube 26 and opening 34 comprise fluid inlet means for establishing fluid communication between a patient and bag 12.

A flexible outlet tube 42 with a downstream end portion 44 through which fluid is dischargeable from the apparatus has an upstream end portion 46 which extends into the bag for fluid communication therewith. For the latter purpose, at its lower right end the bag has a lower outlet section 48 which extends below seal 20 and across which section seal 20 does not extend, to provide a lower opening 50 between panels 14 and 16 in which upstream end portion 46 of tube 42 is secured by a fluid tight tube-encircling heat seal 52 (FIG. 5).

Although tube 42 is flexible, it has sufficient stiffness so that it is not readily bendable. The portions of panels 14 and 16 forming the lower outlet section 48, however, are easily bendable and tend to collapse against each other. The foregoing characteristics permit outlet tube 42, the upstream end portion 46 of which does not extend above seal 20, to be moved or turned, by bending outlet section 48 on a line with seal 20, between two aspects as follows: (a) a first aspect for gravity drainage of fluid from said bag through downstream end portion 44, as illustrated in solid line in FIG. 1, and (b) a second aspect for stopping flow from said bag as a result of collapse against each other of those portions of panels 14 and 16 comprising and adjacent bag section 48, as illustrated in FIG. 2. Accordingly, bendable outlet section 48 in effect provides the bag with flow control means comprised of self-valving coupling for turning the downstream portion of the drainage tube upwardly to the second aspect to interrupt flow from the bag.

The construction is such that when outlet tube 42 is conditioned in its second aspect it overlays or is disposed a long a right side section 54 of the bag. Retainer means comprising a socket 56 has a downwardly facing opening 60 and an upper end portion 58 which if flexibly secured to the outer surface of the upper portion of panel 14 falling within bag section 54. The socket is proportioned to releasably receive and retain downstream end portion 44 of tube 42 which may be manually inserted into and removed from said socket at will. The inherent stiffness of outlet tube 42 preferably is such that it may be moved between said first and second aspects by gripping it at a point distal from its downstream or discharge opening. Thereby, risk of contamination is further minimized.

A heat seal 70, which for the most part extends parallel to side seal 24, is arranged to isolate almost all of bag section 54 from the remainder of the bag so that it cannot receive drainage fluid as the remainder of the bag fills. Accordingly, section 54 cannot distend to apply pressure on tube 42 and thereby prevents the pulling the outlet tube from the socket as the bag fills. As illustrated in FIG. 2, the lower end portion of socket 56 is free to accommodate tensions developing in and about outlet section 48 when tube 42 is in said second aspect.

An imperfect seal 62, which is spaced slightly from seal 22 and extends from seal 24 to a position which is spaced from seal 18, forms a vent tunnel in which there is arranged a rigid duct 64 (FIG. 4) for venting the bag to the outside through an opening 66 adjacent the upper end of section 54. A cotton wad 68 plugs the outer end portion of duct 64 for filtering gases passing into and out of the bag.

At laterally spaced apart positions adjacent seal 62, the bag is heat sealed together in small areas 72 and 74 which are perforated to provide eyelets 76 and 78 by which bag 12 may be suspended from a support (not shown).

The foregoing construction provides an extremely inexpensive, efficient drainage apparatus with a bag and simply managed outlet tube for continuous collection and intermittent emptying of drainage fluids. Moreover, notwithstanding minimal costs involved in construction, the combination and arrangement of parts minimize risk of contamination through the outlet tube 42, while the bag is filling and being emptied.

We claim:

1. In drainage apparatus of the type used for fluids from a patient, the combination comprising: a distendable bag; fluid inlet means for establishing fluid communication between a patient and said bag; an outlet tube having an upstream portion for establishing fluid communication of said outlet tube with said bag and a downstream portion for discharging fluid from said apparatus, said outlet tube arranged for manual movement between a first aspect for emptying said bag and a second aspect in which flow from said bag is stopped and said tube overlies said bag along a side section thereof; retainer means secured from said bag for releasably holding said outlet tube in said second aspect and permitting said bag to fill, in which said side section is fluid sealed from the remainder of said bag to prevent filling of said side section as the remainder of said bag fills, thereby to preclude tension on said outlet tube

tending to separate it from said retainer means.

2. A combination according to claim 1 having flow control means which comprises a bendable self-valving coupling which closes upon turning the downstream portion of said drainage tube upwardly to said second aspect.

3. A combination according to claim 2 in which said self-valving coupling comprises an outlet section of said bag adapted to collapse adjacent the upstream end of said tube for stopping fluid flow from said bag as said tube is turned toward said second aspect.

4. A combination according to claim 1 in which the retainer means is a downwardly opening socket flexibly connected from an upper portion of said bag for releasably receiving said downstream portion when said outlet tube is moved to said second aspect.

5. A combination according to claim 1 in which said distendable bag is of heat sealable fabrication and has a lower bendable outlet section collapsible upon bending to cut flow from said bag, said outlet tube having an upstream portion coupled in said outlet section for turning said outlet tube upwardly to said second aspect along a side of said bag when said extension is bent, said retainer means having an upper portion flexibly secured to an upper portion of said bag and a free downwardly opening socket for releasably receiving the downstream portion of said outlet tube when positioned in its second aspect.

6. A combination according to claim 1 in which the fluid inlet means comprises a fluid inlet tube having a discharge end portion disposed in said bag, said combination characterized by parallel heat seals defining a bag venting tunnel disposed across the top of said bag normally to said discharge end portion and spaced above its discharge opening.

40

45

50

55

60

65

70

75