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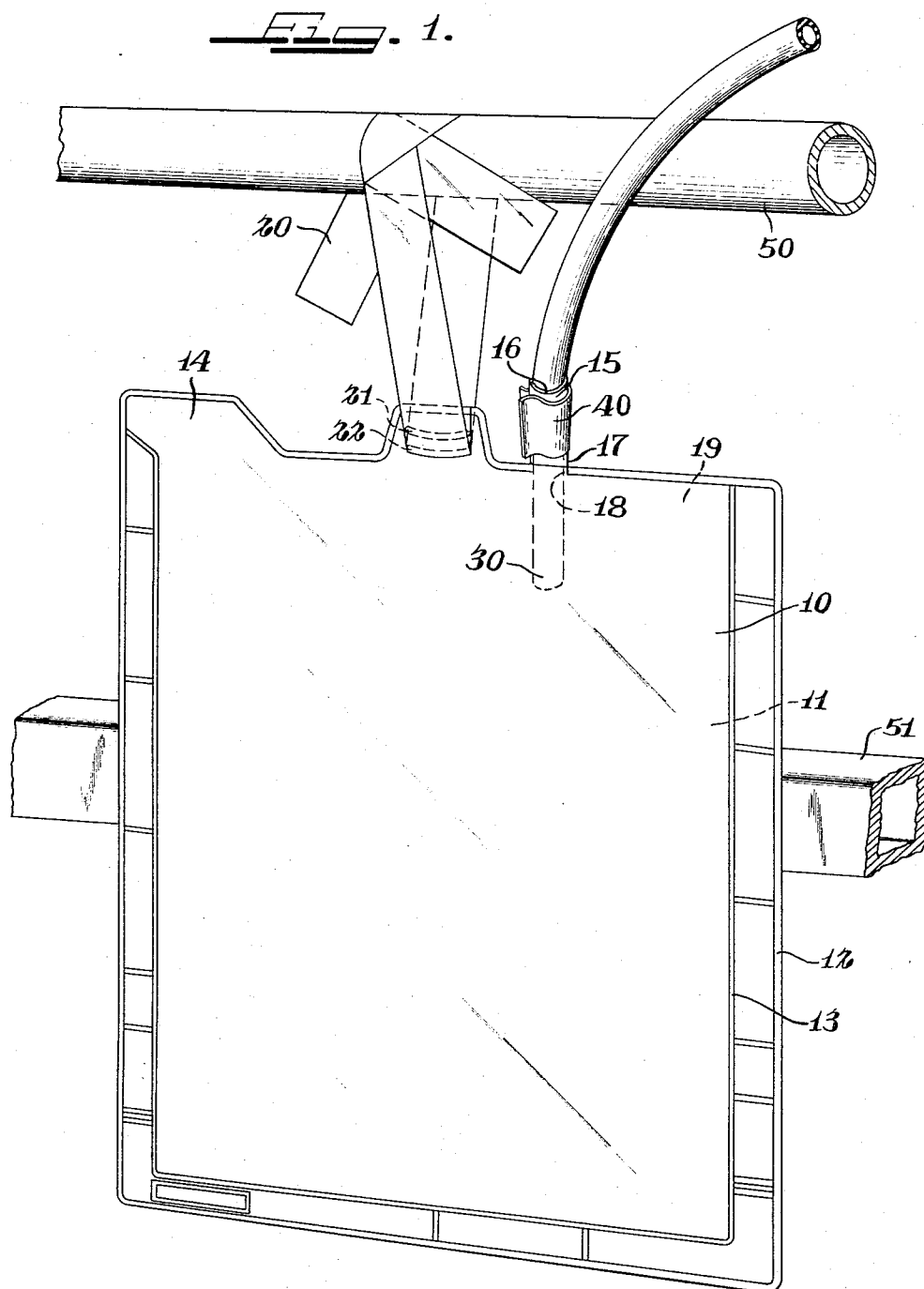
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3,370,589

URINARY DRAINAGE BAG

Filed May 5, 1964

2 Sheets-Sheet 1



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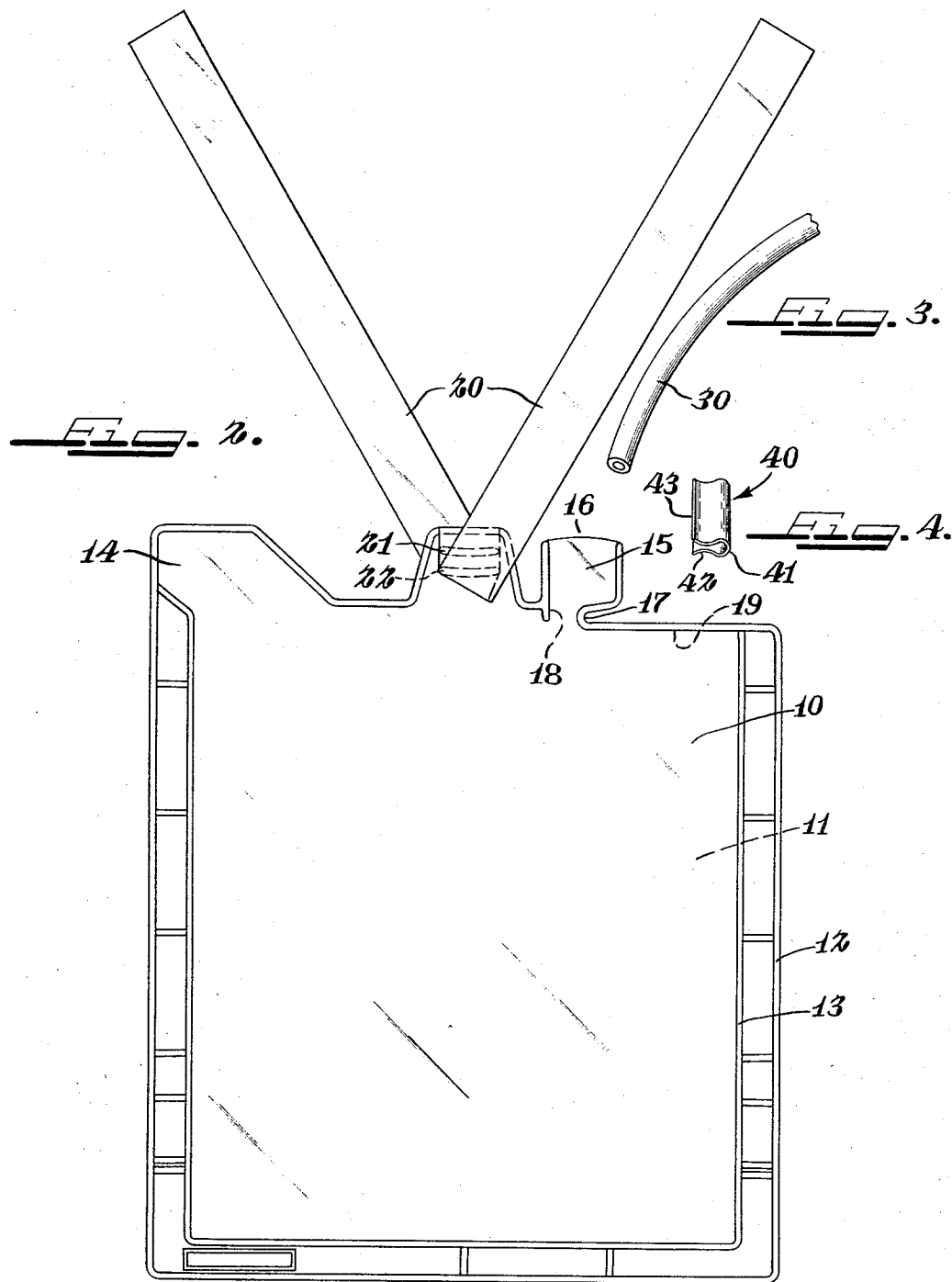
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2 Sheets-Sheet 2



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The present invention relates to urinary drainage containers and more particularly to disposable urinary drainage bags from which a drainage tube cannot be inadvertently removed.

Plastic bags have been used in the past as urinary drainage containers and some of these had a drainage tube secured to them either by permanent or temporary means. In the past, these means would allow the tube to cut or to pull out of a drainage bag when a modest strain was placed on the tube. Even when a tube was permanently secured to a drainage bag, it was not designed to form a closed system. There is now a tendency in the urological field to go to closed drainage systems wherein airborne bacteria cannot get into such a drainage bag, up the tube through a catheter attached to the tube and finally into the patient's bladder. The present invention provides a drainage bag which allows a tube to be inserted or removed easily therefrom while at the same time forming a closed system.

Therefore, an object of the present invention is to provide a new and improved urinary drainage container.

Another object is to provide a closed drainage system set composed of a container, a tube, and a clip to aid in securing the tube to the container.

An additional object is to utilize the cohesive properties of highly cohesive plastic materials to form a combination seal and securing device for securing a urinary drainage tube to a urinary drainage bag.

A further object is to provide an economical sealing and securing means for securing a urinary drainage tube to a urinary drainage bag.

A still further object is to provide a urinary drainage bag which utilizes the cohesion of a highly cohesive plastic to provide an inexpensive support for the bag and to supply a sealing and securing device for a drainage tube to thereby form a closed urinary drainage system.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a side elevational view of an embodiment of the invention assembled and ready for utilization;

FIGURE 2 is an elevational view of the urinary drainage container portion of the embodiment of the invention shown in FIGURE 1;

FIGURE 3 is a perspective view of a drainage tube portion of the embodiment of the invention shown in FIGURE 1; and

FIGURE 4 is a perspective view of a clip portion of the embodiment of the invention shown in FIGURE 1.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail, an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

In the past, drainage bags have been made with cooperating removable drainage tubes to carry fluid into them by passing a removable tube through an aperture in a bag, gathering a portion of the bag near the aperture in folds around the tube, and securing it with a rubber band or a short piece of wire wrapped around the folds and

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twisted. When a stress is placed upon the tube, the tube will pull out of the bag because the friction between the folds immediately underneath the rubber band or wire is not sufficient to prevent such removal. Thus, the movement of a patient may remove the tube from the drainage bag. The present invention overcomes this disadvantage, while providing a removable tube, by utilizing the cohesion between a tab formed as part of the drainage bag and the outer surface of a plastic drainage tube.

In the past, drainage bags utilized fasteners of one type or another on the straps which were used to secure it to a bed or other support. The present invention reduces the cost of a drainage bag by completely eliminating the requirements for a fastener and at the same time eliminates the need for using anything more than a simple overhead knot to secure the bag to a supporting structure. This is accomplished by utilizing highly cohesive straps on the bag wherein the cohesion of the traps provided by an overhand knot is sufficient to support the bag without slipping even though it is completely filled with fluid.

Referring first to FIGURES 1 and 2, a urinary drainage container includes a transparent flexible sheet 10 overlying a translucent flexible sheet 11 which are heat sealed together at their outer edges as at 12 and at an inner line as indicated at 13. Thus, the two sheets of plastic form a urinary drainage bag. The material used in the sheets may be chosen from any of a large number of plastic materials, but a preferred material for the transparent sheet 10 is Union Carbide's polyvinyl designation KDA 2328, Clear 131, Standard Mat, and a preferred material for the translucent sheet 11 is Union Carbide's polyvinyl designation KDA 2330, White 473, Taffeta 02. The bag has a closed tab portion 14 in the upper left-hand corner and a tab portion 15 open along its upper edge 16. The patterns of the sheets are so laid out that the tab portion 15 is joined to the main portion of the sheets by a neck 17 which leaves an aperture 18 between the interior of the tab 15 and the interior of a principal portion of the drainage bag as indicated at 19. A continuous strip of very highly cohesive material 20 is secured to both sheets of the drainage bag along the areas indicated at 21 and 22 by being folded over the top of the bag and then heat sealed from both sides onto the outer surfaces of the opposing sheets at 21 and 22. Although a number of plastic materials could be used for strip 20, a preferred material is a polished flexible polyvinyl having Union Carbide's designation KDA 2227, Clear 11, Gloss 06.

Referring now to FIGURE 1 and specifically to FIGURE 3, the end of a urinary drainage tube 30 is shown both inserted through the tab 15 and the aperture 18 formed by the neck 17 and removed from the urinary drainage bag respectively. The tube 30 is preferably made of polished polyvinyl plastic. The drainage tube may be either the proximal end of a catheter or may be a separate drainage tube which is connected to a catheter in a conventional manner.

When two pieces of cohesive or adhesive materials are brought in contact with each other such as the plastic tube 30 and the interior of the tab 15 by wrapping the tab around the tube, the cohesion is increased by pressure forcing the two pieces together. In order to create a pressure, a spring clip 40 shown in FIGURES 1 and 4 is composed of a U-shaped body portion 41 wherein the internal diameter of the U-shaped portion is slightly less than the outer diameter of the tube 30. The clip has a pair of flared sections 42 and 43 to provide a guide for slipping the U-shaped portion of the clip about the tab 15 after it has been wrapped around the tube 30. The clip 40 is constructed of a metal that has the ability to provide tension constantly over a long period of time. Although the spring clip may be made of many materials, most are inadequate

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as a spring clip material because they gradually lose their tension and become set in a new position into which they have been forced. It will be recognized by those skilled in the art that any plastic, metal or other material which can constantly retain its ability to apply pressure by retaining its resiliency may be used to construct the clip 40.

Referring now to FIGURES 2, 3 and 4, the utilization of a drainage bag container will now be described in greater detail. After the distal end of a drainage tube 30 or the distal end of a catheter to which the drainage tube 30 is connected is inserted into a patient and properly located, the proximal end of the tube 30 is inserted through the interior of the tab 15 and the aperture 18 formed by the neck 17 until it is positioned as shown in FIGURE 1. The aperture 18 is made slightly larger than the outer circumference of the tube 30 in order that the tab 15 may be smoothly wrapped around the tube 30 as shown in FIGURE 1. The wider opening of the tab 15 at its edge 16 allows the end of the tube 30 to be inserted easily into the open edge of the tab which, in turn, aids in guiding the end of the tube through the narrower aperture 18. This feature of the present invention aids in the expeditious assembling of the tube to the bag. Therefore, tab 15 is, in effect, a flexible enclosure for guiding a tube into a container. After the tube is inserted into the bag, the tab 15 is smoothly wrapped around it, and the clip 40 with the aid of its flared portions is quickly slipped over the wrapped tab 15 as illustrated in FIGURE 1. The clip exerts sufficient tension on the tab 15 and the tube 30 that their coherence will prevent parting of the tube from the bag by movement of a patient. Thus, inadvertent separation of the tube from the bag is avoided as has been encountered by removable tubes and bags utilized in the past.

Referring to FIGURE 1, the bag may be supported on any convenient structure which is normally the longitudinal members of a hospital bed as are illustrated by a circular rod 50 and a rectangular rod 51. The bag may be quickly secured to the bed by simply tying an overhand knot in the highly cohesive straps 20 over the rod 50 as shown in FIGURE 1. The cohesion of the straps toward each other is sufficient to securely support the weight of the bag and its contents when it is completely filled with fluid. To accomplish this for a bag with a 2,000 cc. capacity, the straps do not have to be wider than $\frac{3}{4}$ ". In order to provide sufficient cohesion, the weight of the bag as the amount of fluid content increases exerts increasing pressure on a portion of its straps at the overhand knot, thereby increasing the coherence of the straps for each other as the weight of the bag and contents increases. The translucent side 10 is placed toward the outside of the bed in order to reduce the objectionable appearance of its contents to visitors while a nurse may quickly turn the bag to its transparent side to observe the contents.

When it becomes desirable to empty the contents of the bag, the top portion of the tab 14 is quickly clipped off with a pair of shears and the bag expeditiously emptied through the resulting aperture. The closed drainage system may quickly be re-established by folding over the tab 14 and securing it with any suitable clip such as a paper clip.

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Although a presently preferred embodiment of the invention has been described and illustrated, those skilled in the art will recognize that many modifications may be made which are within the scope of the invention. For example, the tab 15 could be a tab which extends from only one of the two sheets with the other sheet ending at the neck 17. In such a modification, the ability of securing the tube to the bag is retained with the loss of the ability of a tab to act as a guide for placing a tube into the bag and the ability of forming a closed system. All such modifications are intended to be within the scope of the invention as pointed out in the appended claims.

We claim:

1. In a urinary drainage bag comprising two sheets of flexible plastic material, each sheet having a tab portion joined to a main body portion by a neck portion which is narrower than the main body portion of said tab portion, said sheets being heat sealed to each other along their edges except along an edge of each tab portion opposite said neck portion, the interior diameter of unsealed edge and main body portion of said tab portion being substantially greater than the interior diameter of said neck portion and said tab portion having an interior wall sloping from said main body portion to said narrow neck portion, a pair of elongate highly cohesive plastic strips heat sealed to said sheets at the top center portion of said bag for use in hanging said bag from a stationary member, a flexible plastic drainage tube capable of having one end portion inserted into said bag by threading said end of said tube into the main body portion of said tab portion between the unsealed edges thereof and along said sloping wall and between said neck portions, the wider main body portion of said tab portion is wrapped smoothly around the inserted end portion of said tube, a resilient clip for securing said tab portion in said wrapped position around said inserted tube end portion, said clip having an elongate substantially U-shaped body portion, an interior annular portion in said body portion forming an arc greater than 180° and having an unstressed diameter slightly less than an outside diameter of the inserted end portion of said tube, and said clip having the sides of the U-shaped body portion gripping said wrapped around tab portion and tube for securing said tube in said bag.

2. The combination as claimed in claim 1 wherein said straps secured to said bag have a sufficient cohesive capacity that when they are tied by a single overhand knot over a bar they will support the weight of the bag even when it is filled with fluid.

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