

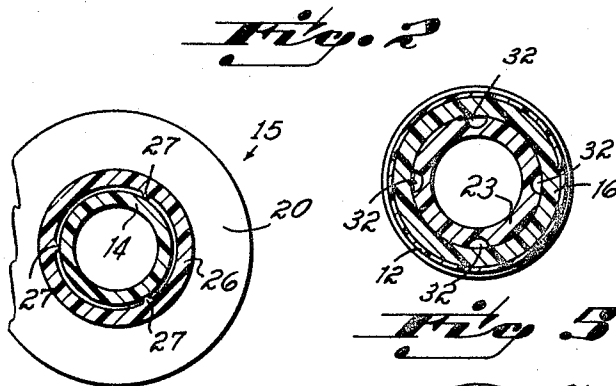
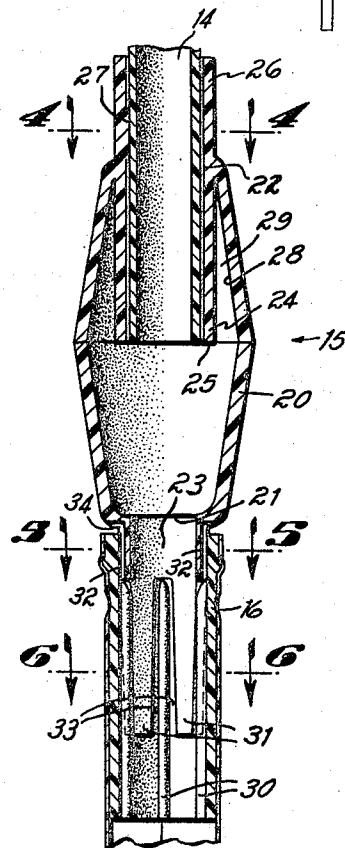
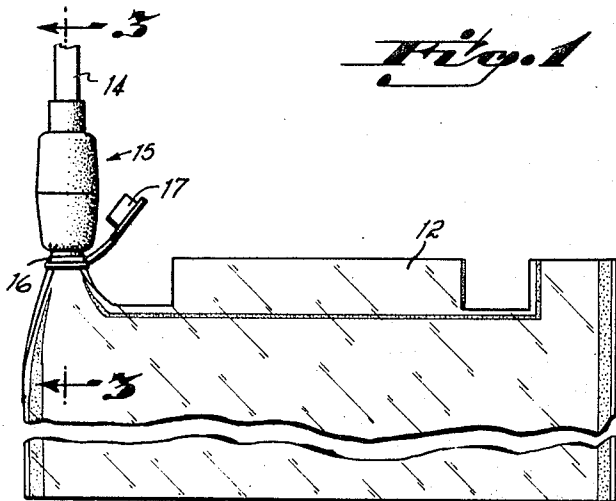
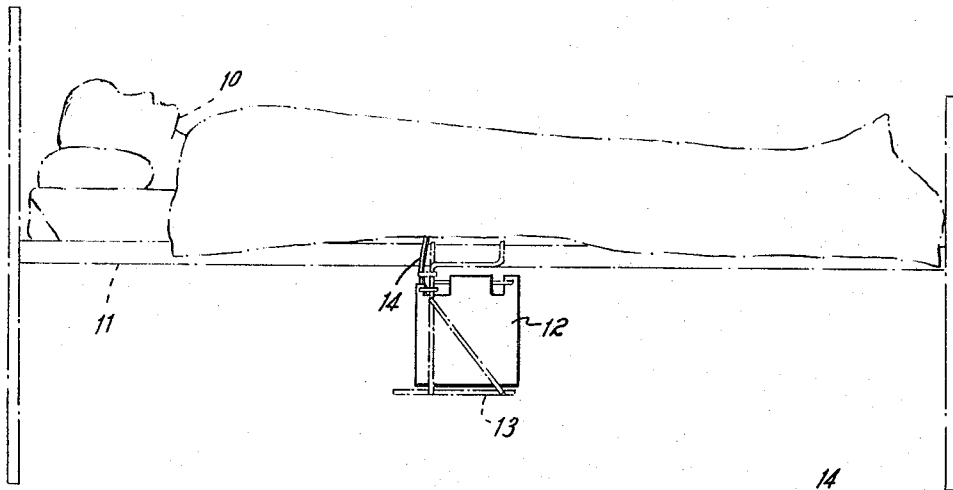
July 25, 1967

C. W. JINKENS ETAL

3,332,422

ISOLATING CONNECTOR FOR DRAINAGE BAG

Filed Sept. 24, 1963



INVENTORS
Charles W. Jinkens
Charles E. Waldhellig
BY Wood, Herron, Evans
ATTORNEYS

1

2

3,332,422

ISOLATING CONNECTOR FOR DRAINAGE BAG
Charles W. Jinkens and Charles C. Waldbillig, Columbus,
Ohio, assignors to Medex Inc., Columbus, Ohio, a cor-
poration of Ohio

Filed Sept. 24, 1963, Ser. No. 311,143

2 Claims. (Cl. 128—275)

This invention relates to a drainage bag for collecting fluids drained from a tube in the body of a patient, and more particularly the invention is directed to a connector located between the tube and the drainage bag, the connector preventing such movement of bacteria from the bag into the patient as might tend to reinfest the patient.

There are many instances when, in the care of a patient, it is necessary to provide for the continuous draining of fluids, such as urine, from the body of the patient. The drainage is effected by inserting a tube, such as a catheter tube, into the body of the patient and permitting the fluid to flow by gravity into a receptacle connected to the discharge end of the drainage tube. In the more enlightened hospitals, the receptacle into which the fluids are drained is a disposable bag. It is far less costly to throw away a used drainage bag than it is to wash, sterilize and store a permanent receptacle. Further, there is no possibility of breakage, which not only results in the need and labor expense in cleaning up, but the inadvertent breaking of a glass receptacle might disturb the patient. Still further, the disposable drainage bag is lightweight and may be conveniently carried from place to place by ambulatory patients.

In copending application Serial No. 177,393 filed March 6, 1962, there is disclosed a drainage bag having adapter means for receiving the end of a drainage tube in such a way as to permit the venting of the drainage bag as fluid drains into it. The adapter has an integral cap which permits the bag to be sealed when it has been filled, thereby facilitating its removal from the patient and final disposal.

In the use of that drainage bag, as well as other types of flexible drainage bags, the treatment of certain patient disorders involves the possibility of bacteria in the drained fluid moving from the fluid bag into the patient with the consequent possibility of reinfesting the patient. The bacteria finds a continuous path from the bag to the patient, the path having been formed by the moistening of the tube and bag as the fluid drains from the patient.

It has been an objective of the invention to provide a connector between the bag and the patient which permits the flow of fluid from the patient to the bag but which isolates the bacteria in the bag from the patient by providing a dry barrier between the bag and the patient.

It has been another objective of the invention to provide an isolating connector of the type described, the connector having means for the venting of the bag during the flow of fluids into it.

It has been still another objective of the invention to provide an isolating connector of the type described which may be applied to the adapter of the earlier application so that no change is required in an existing bag in order to use the connector and so that the advantages of the adapter of the earlier application are retained.

These and other objectives of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

FIG. 1 is an elevational view illustrating the environment with which the invention is used,

FIG. 2 is a fragmentary elevational view showing the invention applied to a drainage bag,

FIG. 3 is a cross sectional view taken along lines 3—3 of FIG. 2,

FIG. 4 is a cross sectional view taken along lines 4—4 of FIG. 3,

FIG. 5 is a cross sectional view taken along lines 5—5 of FIG. 3, and

FIG. 6 is a cross sectional view taken along lines 6—6 of FIG. 3.

Referring to FIG. 1, a patient 10 is shown lying on a bed 11. A drainage bag 12 is mounted by means of a carrier 13 on the bed and receives fluid from the patient through a tube 14.

As shown in FIG. 2, the tube 14 is connected to the bag 12 through an isolating connector 15. The connector 15 is inserted into an adapter 16 which is described fully in copending application Serial No. 177,393, the adapter having an integral cap 17 by which the adapter and bag can be sealed after fluid has been collected in the bag.

The isolating connector is shown in detail in the cross sectional view, FIG. 3. It comprises a bulb 20 having an opening 21 at its lower end and an opening 22 at its upper end. A spigot 23 projects from the lower end of the bulb and is insertable into the adapter 16 to form the attachment of the connector to the drainage bag.

At the upper end of the bulb 20, a drip stem 24 projects from the opening 22 into the center of the bulb and terminates in an end 25 which is spaced an appreciable distance from the interior surface of the bulb. A connector sleeve 26 forms a continuous upwardly or outwardly projecting extension of the drip stem 25. The drip stem and connector sleeve provide a continuous bore adapted to receive the discharge end of tube 14 which receives the fluids draining from the patient's body. Connector sleeve has there circumferentially spaced longitudinally extending ribs 27 (see also FIG. 4) which frictionally engage the tube 14 to hold it in proper position in the connector sleeve. The principal function of the ribs is to facilitate the insertion of the tube 14 into the connector sleeve while assuring the firm retention of the tube in the sleeve. Additionally, the ribs space the tube 14 from the wall of the connector sleeve and can provide a venting function.

The upper half of the bulb 20 provides a skirt 28 surrounding drip stem 24 and forms with the drip stem an annular air pocket 29 which assists in creating the bacteria barrier described below.

The spigot 23 is formed to cooperate with the adapter 16 without eliminating the venting of the bag by the passage of air between the spigot and the adapter. If the spigot were a short, cylindrical section inserted in the adapter when the connector is in place, there would be a possibility of blocking the flow of air in the space between the spigot and the adapter provided by the ribs 30. The fluid dripping from the end of the spigot can flow, by capillary action, from the end of the spigot upwardly in the space between the adapter and the spigot, thus blocking that space. As described in the earlier application, one way of avoiding such capillary flow with its consequent blocking of the venting of the bag is to insert the end of the connector tube into the bag well beyond the adapter so that the fluid drips well below the space between the tube and the adapter. A similar result could be obtained in the present application by making the spigot substantially longer than the adapter so that it would terminate well below the inner end of the adapter.

However, it is preferred to form the spigot as illustrated, the spigot including circumferentially spaced tines 31, the adjacent tines straddling the ribs 30, as shown in FIGS. 3 and 6. The outer surface of the spigot between the tines and the bulb has four longitudinally extending venting grooves 32. The grooves 32 extend upwardly from the apices of the spaces 33 formed between adjacent tines to the lower end of the bulb 20, the grooves being formed partly in the lower end of the bulb, as at 34, so

that they are of an L-configuration. Thus, if the bulb is jammed tightly against the upper surface of the adapter 16, venting air can flow from the passage formed by the longitudinally extending portions 32 of the grooves outwardly through the portions 34 of the grooves in the lower end of the bulb.

In the operation of the invention, fluid flows from the tube 14 into the bulb 20 and drips down to the lower end of the bulb. From there, the fluid passes through the spigot and adapter into the drainage bag. In dripping from the drip stem into the lower end of the bulb, the major portion of the interior surface of the bulb 20 remains dry. Bacteria moving from the bag to the patient would have to follow a path which includes the total length of the interior surface of the bulb, the outside surface of the drip stem and the internal surface of the tube 14. Since that portion of the bulb 20 above its lower end, or at least above the center of the bulb, is dry, bacteria can find no such fluid path to move from the bag into the patient.

If in the initial introduction of the drainage tube into the body of the patient, entrapped fluid is discharged in large gushing quantity, there is still no possibility of filling the bulb so as to create a fluid path for the bacteria. The fluid might fill the bulb to approximately the center line, but the pocket of air in annular space 29 between the drip stem 24 and the bulb skirt 28 will prevent the wetting of the upper portion of the bulb surface during this initial discharge of bodily fluid. Thereafter, the fluid will slowly drip from the patient into the drainage bag without the possibility of wetting the inner surface of skirt 28.

It should be understood that the preferred form of the invention is as shown with a drip stem projecting approximately halfway between the ends of the bulb 20. The drip stem could be eliminated with the inwardly projecting end of tube 14 serving the same function as the drip stem. However, such design would place too much reliance on the attendant's precise positioning of the tube 14 within the bulb 20 and would not provide as perfect an airlock blocking the movement of initially discharged fluid into the annular pocket 29.

What is claimed is:

1. A drainage bag connected to a drainage tube comprising,

a fluid tight bag having an opening,
a cylindrical hollow adapter in said opening and hav-

ing a plurality of circumferentially spaced longitudinally extending ribs on its interior surface, an isolating bulb having openings in the upper and lower ends,

a drip stem connected to said drainage tube and extending from the upper opening in said bulb into the center of said bulb, the inner end of said drip stem being spaced from said inner surface of said bulb, and

a spigot projecting from the lower opening of said bulb,

said spigot including a plurality of circumferentially spaced longitudinally extending tines projecting into said adapter and straddling said adapter ribs, and

said spigot having longitudinally extending grooves on its outer surface extending from the spaces between tines to the lower end of said bulb.

2. A drainage bag connected to a drainage tube comprising,

a fluid tight bag having an opening,

a cylindrical hollow adapter in said opening and having a plurality of circumferentially spaced longitudinally extending ribs on its interior surface,

an isolating bulb having openings in the upper and lower ends,

a drip stem connected to said drainage tube and extending from the upper opening in said bulb into the center of said bulb, the inner end of said drip stem being spaced from said inner surface of said bulb, and

a spigot projecting from the lower opening of said bulb,

said spigot including a plurality of circumferentially spaced longitudinally extending tines projecting into said adapter and straddling said adapter ribs.

References Cited

UNITED STATES PATENTS

2,959,386	11/1960	Garth	128—275 X
3,063,451	11/1962	Kowalk	128—276
3,100,490	8/1963	Desautels	128—275 X
3,231,901	2/1966	Kennedy	
3,237,624	3/1966	Jinkens et al.	128—275

RICHARD A. GAUDET, *Primary Examiner*.

C. F. ROSENBAUM, *Assistant Examiner*.