United States Patent [19]

Paludan et al.

[11] **3,838,691**

[45] **Oct. 1, 1974**

[54] **CATHETER DEVICE**

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[73] Assignee: **Pharma-Plasto (Australia) Pty. Limited**

[22] Filed: **Feb. 9, 1973**

[21] Appl. No.: **331,190**

[30] **Foreign Application Priority Data**

Feb. 25, 1972 Australia 8065/72

[52] **U.S. Cl.** **128/275**

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

[58] **Field of Search** ..... 128/2 F, DIG. 24, 275, 128/295

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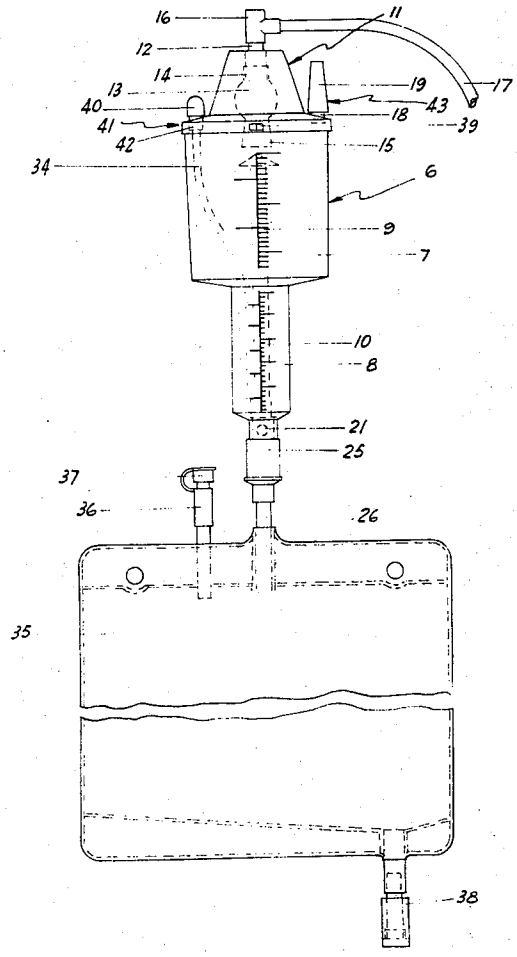
[57] **ABSTRACT**

A catheter device having a graduated container fed by a catheter tube, venting means providing for displacement of air from the container and an outlet tube extending upwardly into the container, the outlet tube having an overflow hole disposed within the container and a drain hole spaced downwardly from the overflow hole. The outlet tube is manually movable from a first position in which the drain hole is closed to a second position wherein the drain hole is open to the interior of the container.

12 Claims, 5 Drawing Figures



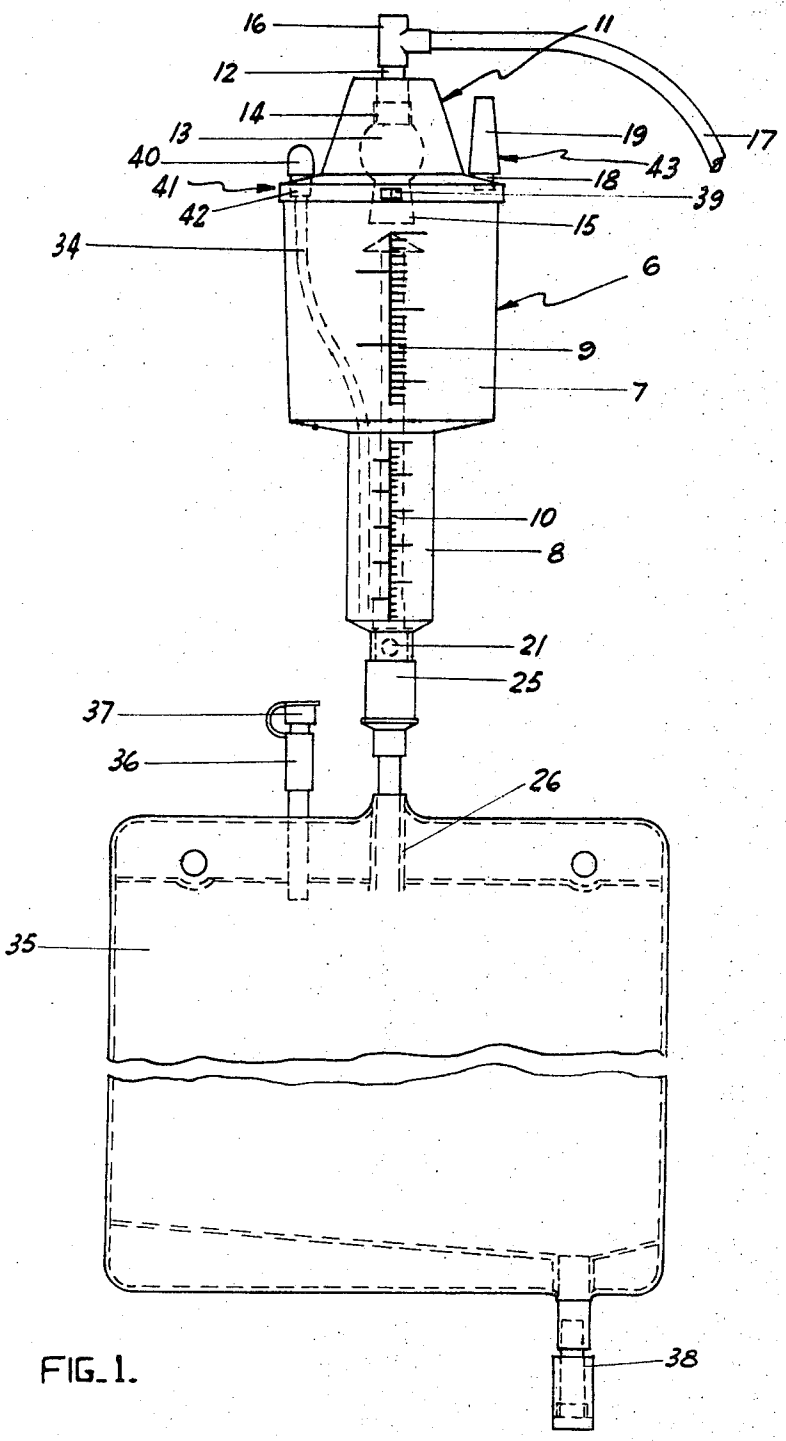

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FIG. 1.

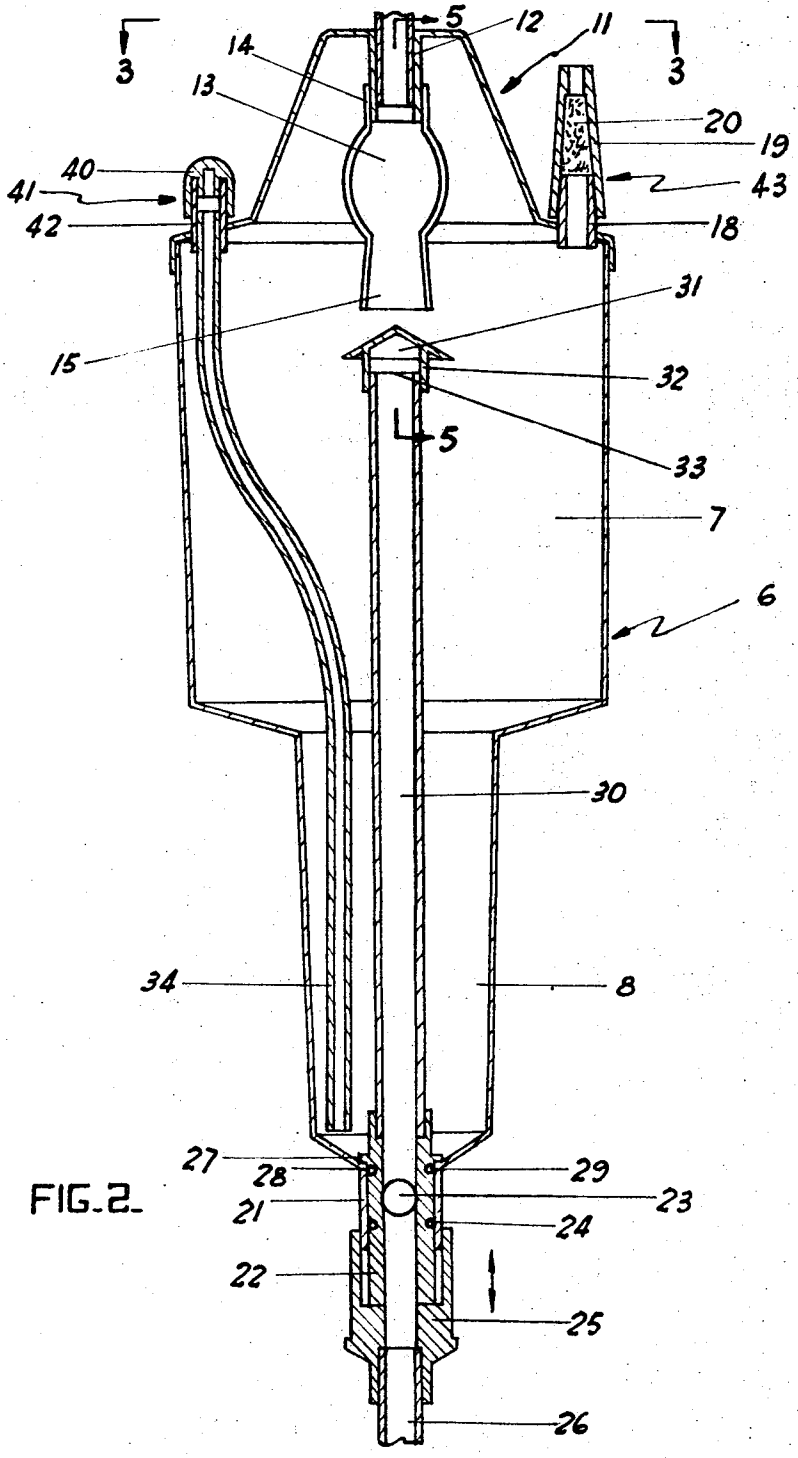
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FIG. 2.

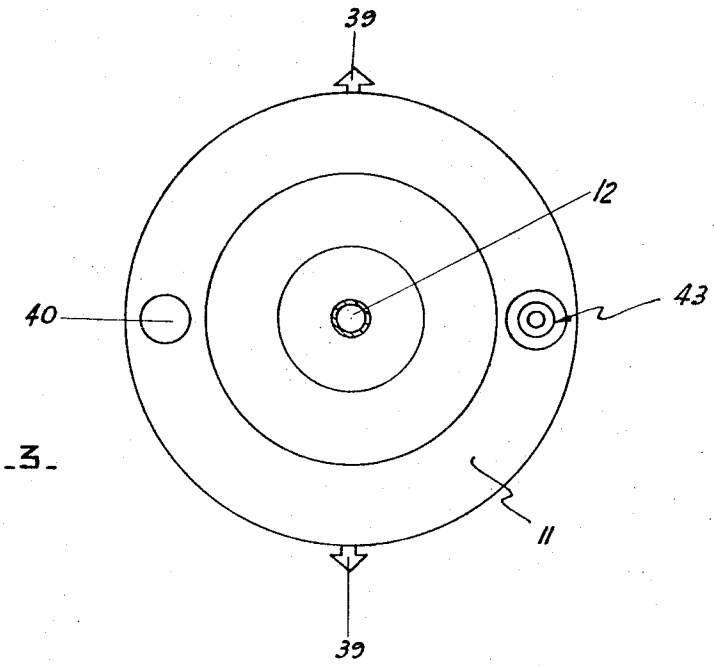
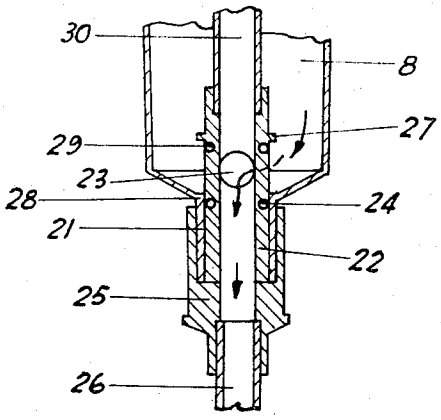


FIG_3_



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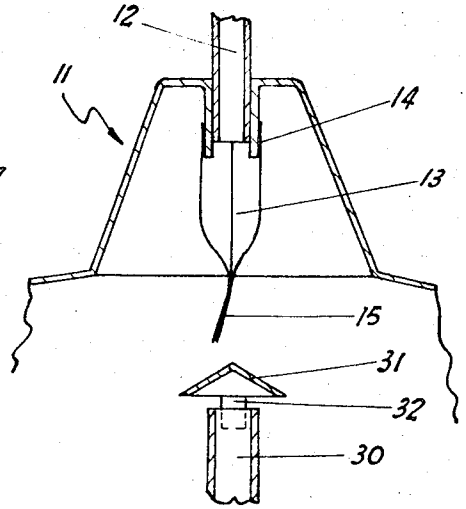

FIG_5_

CATHETER DEVICE

This invention relates to catheter devices and more particularly to a measuring device for use with urinary catheters.

It is customary during and after renal operations to drain urine from a patient's body by means of catheter devices and to measure the urinary output. In such measurements it is desired to know the volume of initial amounts of drainage accurately while that of subsequent larger amounts need only be estimated roughly.

In previously known catheter devices, a graduated measuring container is provided, which is fed by a catheter tube and carries a drain with a stopcock. The use of such a catheter device must be closely supervised in order to avoid the filling up of the apparatus and consequential backflow of urine to the patient's body.

Attempts have therefore been made to incorporate overflow tubes in catheter devices. The overflow tube extends through the lower portion of the measuring container and opens therein at a height corresponding to the desired maximum level of urine in said container. The overflow tube is connected to one limb of a Y-junction piece of which the other limb is connected via a valve to the drain of the container, and the foot extends to a sink or the like.

The last-mentioned arrangement has been found difficult and cumbersome for operation by a nurse who customarily keeps a patient under surveillance.

An object of the present invention is to provide a simple, reliable, conveniently operated and economical catheter device.

The invention consists in a catheter device comprising a graduated container fed by a catheter tube, venting means providing for displacement of air from said container and an outlet tube extending upwardly into said container through a liquid tight gland in the floor thereof, said outlet tube having an overflow hole disposed within the container and a drain hole spaced downwardly of the overflow hole, and being manually movable from a first position wherein said drain hole is closed to a second position wherein said drain hole is open to the interior of said container.

A preferred embodiment of this invention shall be described with reference to the accompanying drawings, wherein:

FIG. 1 is an elevational view of a catheter device connected to a drainage bag.

FIG. 2 is a sectional view of the catheter device of FIG. 1.

FIG. 3 is a plan view of the catheter device of FIG. 1 taken in the direction of the line 3—3 in FIG. 2.

FIG. 4 is an enlarged sectional view of the lower portion of the catheter device of FIG. 1.

FIG. 5 is a sectional view of an inlet tube, a non-return valve and part of an outlet tube, all being components of the catheter device of FIG. 1.

Referring to the drawings, a graduated container 6 is in the form of a tapered cylinder comprising an upper compartment 7, marked with calibrated scale 9, lower compartment 8 of smaller section, carrying a finer calibrated scale 10 and throat 21. The upper compartment 7 may have a capacity of 250 mls. and scale 9 thereon may be read to the nearest hundredth of a liter. The lower compartment 8 may have a volume of 50 mls.

and volume readings may be taken on scale 10 to an accuracy of a milliliter.

A cover 11 of container 6 carries an inlet tube 12 which passes therethrough and communicates with a catheter tube 17 via an elbow junction 16.

In this preferred embodiment a non return valve 13 is provided which comprises a bag-like structure made of pliable plastics film or other pliable and light-weight water repelling material, with its mouth 14 sleeved onto the tube 12 and its flaring end 15 defining a slit for non-return passage of liquid therethrough. Non return valve 13 also serves as a bacteriostatic trap.

The cover 11 also carries sample access means 41 which may comprise a spigot 42 air-tightly stoppered by a rubber or other plug 40 and connected to a dip tube 34 which extends to the bottom of the lower compartment 8. A sample of the liquid in the container 6 may be drawn by way of access means 41 by means of a syringe or the like. Venting means 43 situated on cover 11 comprise an air outlet tube 18 and a chimney structure 19 fitted thereon and holding a plug of cotton wool 20 which serves to filter dust particles and germs from air passing therethrough. Venting means 43 allows displaced air in container 6 to escape as the latter is being filled and permits air to be drawn into container 6 when liquid therein is being drained off. This prevents abrupt changes in pressure in the catheter tube 17, which would cause uneasiness in the patient.

An outlet tube 30 extending into container 6 is opened at its upper end to provide an overflow hole 33, into which liquid can overflow when the liquid level in the container 6 rises beyond its level. Thus outlet tube 30 and non-return valve 13 together provide double safety measures against the back flowing of liquid into the catheter tube 17.

A roof 31 fixed by pillars 32 over overflow hole 33 prevents dripping of inflowing liquid thereinto. Tube 30 is manually movable axially. It includes a journal portion 22 which defines a drain hole 23. The portion 22 slidingly engages throat 21, such that drain hole 23 is exposable to the interior of the lower compartment 8 for drainage of the contents in the container 6. Drain hole 23 is located between upper and lower sealing washers 29 and 24 lodged in circumferential grooves in the overflow tube 30. The washers 29 and 24 bear liquid-tightly against the internal wall of throat 21 to prevent leakage between tube portion 22 and throat 21. When tube 30 is withdrawn from container 6 by pulling a collar 25 of tube 30 until an abutment 27 abuts the proximal end 28 of the throat 21, the drain hole 23 will be wholly within the throat 21 and drainage thereinto will be blocked by upper washer 29. Drain hole 23 can be exposed to the interior of the lower compartment 8 by plunging tube 30 into container 6 until the collar 25 contacts the end of throat 21.

FIG. 4 shows tube 30 in the fully upwardly extended position wherein liquid in container 6 may drain into outlet tube 30 via drain hole 23 as indicated by the arrows.

In this preferred embodiment, a drainage bag 35 is also provided to act as a bulk storage for the collected liquid. It is adapted to receive the distal end 26 of outlet tube 30 and is furnished with an additive inlet tube 36 fitted with a closure cap 37, for the introduction of additives such as germicidal or bacteriostatic agents. A drain valve 38 on the drainage bag 35 allows the latter

to be emptied. Approximate measurements of the amount of liquid in the bag **35** can still be made either by examining a calibrated scale thereon or by draining the liquid into other measuring devices.

Lugs **39** on the rim of cover **11** facilitate the mounting of the catheter device.

The preferred embodiment is so proportioned that when it is mounted from a frame of a bed with the inlet tube slightly below the body of the patient, the drain valve **38** of the drainage bag **35** is just above floor level to allow operations thereon, and the collar **25** is handy at a convenient height; having regard to the usual height of a hospital bed.

Following use, the catheter device may be sterilized by treatment with sterilising agent and may be reused.

In another embodiment of this invention, an outlet tube is manually rotatable about its axis within a sleeve from a first position wherein a drain hole thereon is closed to a second position wherein the drain hole is in alignment with a duct communicating with the interior of the container.

We claim:

1. A catheter device comprising a graduated container fed by a catheter tube, venting means providing for displacement of air from said container and a rigid outlet tube extending upwardly into said container through a liquid tight gland in the floor thereof, said outlet tube having an overflow hole disposed within the container and a drain hole spaced downwardly of the overflow hole, and being manually slidable within said container from a first position wherein said drain hole is closed to a second position wherein said drain hole is open to the interior of said container.

2. A catheter device as claimed in claim **1** wherein said container comprises a finely graduated lower compartment, a coarsely graduated larger upper compartment and a cover adapted to fit over said upper compartment.

3. A catheter device as defined in claim **1** wherein said venting means comprise an air outlet tube communicating with said container and a chimney-like structure fitted on said air outlet tube, containing an air filtering medium.

4. A catheter device as defined in claim **1** wherein a drainage bag is provided which is communicating with said outlet tube and is adapted to receive liquid draining therefrom.

5. A catheter device as claimed in claim **4** wherein said bag is calibrated in volume.

6. A catheter device comprising a graduated container fed by a catheter tube, venting means providing for displacement of air from said container and an outlet tube extending upwardly into said container through a liquid tight gland in the floor thereof, said outlet tube haivng an overflow hole disposed within the container and a drain hole spaced downwardly from a first position wherein said drain hole is closed to a second position wherein said drain hole is open to the interior of said container; said container comprising a finely graduated lower compartment, a coarsely graduated larger upper compartment and a cover adapted to fit over said upper compartment; and wherein said outlet tube is axially movable such that said drain hole is without said lower compartment in said first position and within said lower compartment in said second position.

7. A catheter device as claimed in claim **6** wherein said bag has an additive tube fitted with a closure cap and a drain valve controlling drainage of the contents of said bag.

8. A catheter device comprising a graduated container fed by a catheter tube, venting means providing for displacement of air from said container and an outlet tube extending upwardly into said container through a liquid tight gland in the floor thereof, said outlet tube having an overflow hole disposed within the container and a drain hole spaced downwardly from a first position wherein said drain hole is closed to a second position wherein said drain hole is open to the interior of said container; and wherein said outlet tube is axially movable such that said drain hole is closed from the interior of said container in said first position and open to said container in said second position.

9. The catheter device as defined in claim **8** and wherein said catheter tube is connected to said container through an elbow connector.

10. A catheter device as claimed in claim **8** wherein a non-return valve is provided comprising a bag-like structure with a mouth communicating with said catheter tube and an end defining a slit for non-return passage of liquid therethrough.

11. A catheter device as claimed in either claim including sample access means through which a sample of said liquid may be drawn.

12. A catheter device as claimed in claim **11** wherein said sample access means comprise a dip tube which extends to the bottom of said lower compartment and carries a spigot on its upper end, said spigot being stoppered by a plug.

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