



(43) International Publication Date
5 January 2017 (05.01.2017)

(10) International Publication Number
WO 2017/002050 A2

- (51) **International Patent Classification:**
A61F 5/44 (2006.01) *A61M 39/00* (2006.01)
- (21) **International Application Number:**
PCT/IB2016/053911
- (22) **International Filing Date:**
30 June 2016 (30.06.2016)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
LK/P/1/18294 30 June 2015 (30.06.2015) LK
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- (81) **Designated States** (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,

BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,
MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,
PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,
SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,
TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished
upon receipt of that report (Rule 48.2(g))*



WO 2017/002050 A2

(54) **Title:** DEVICE WITH CATHETER TUBE AND EXTERNAL PUBLIC BLADER WITH HANGER

(57) **Abstract:** Patients with long-term indwelling urinary catheters are in difficulty to carry and keep catheter bag when they wants to move or travel. This uneasy and discomfort to the patents who are no bed reddened are more with depression and anxiety than others. Further more prolong indwelling catheter cause bladder dystonia and patient need to be allowed period of bladder training before removal of the catheter. In addition it is at an increased risk for urinary tract infection. Catheter-associated urinary tract infections (CAUTIs) are a significant source of morbidity and mortality in long-term care facilities. The financial impact of the infection is kept more attention in the management of such patients which is caused by ascending bacteria through the closed drainage system. In an attempt to reduce this ascent, intra catheter lock-out valve system was devised that maintains a closed system during bag exchange or next desire to pass urination as natural events. Furthermore it helps to detach bags and external tube when patients need to move or travel a long distance. This avoids much discomfort to the patients with existed drained system with the catheter bag. The concept is introduced to a patient comfort and CAUTIs are needed to further reviewed.

DEVICE WITH CATHETER TUBE AND EXTERNAL PUBLIC BLADER WITH HANGER

2. DESCRIPTION

BACKGROUND OF INVENTION

Past prostate surgery survivors have revealed that the most frustrating hurdle has to use a catheter and bag following the procedure. The bag was difficult to conceal and was awkward when wearing shorts and engaging in leisure activities. This new invention is put forward to reduce this discomfort.

The invention relates generally to novel construction for a urinary catheter tube held on by a catheter hanger with associated device. More specifically, the present invention relates to a catheter hanger holding and protecting catheter and the catheter tube and the device outside of the body. In addition it relates further a urinary catheter tube clamp device that includes a backflow preventive tap valve that is located in the catheter tube between a proximal point catheter tube where it is connected of the catheter and outer opening of the catheter tube where there is the urine passing tap providing improved construction and a safer location relative to the prior art devices.

In the world, more than hundred millions people suffer from urinary track problems and should need to use urinary catheter for a long time. If the catheter remains in place for a period of time, the possibility exists that, should the collection container be crushed or raised above the level of the body cavity being drained, the drained fluid may flow in reverse and reenter the cavity from which it was drained. This is of particular concern in cases where the catheter may be inserted for long periods for constant cavity drainage. In these cases, the drained fluid may remain in the drainage container for several hours allowing the growth of harmful bacteria. Should this fluid be reintroduced to the body cavity serious or even deadly infections could result from it.

Therefore this invention is designed to keep away the catheter bag when patient or catheter wearer is working or participating in a special event.

While one prior art/types or inventions catheter disclosed a one-way check valve in the drainage lumen, the valve was located proximal to the insertion end of the catheter (US 7331949 B2). The placement and design of the valve were formulated primarily to retain any fluid that may be within the catheter during withdrawal and disposal. In this manner, the valve prevented fluid from flowing out of the withdrawn catheter onto the floor or more importantly onto the medical professional handling the catheter. However, this valve design is only appropriate for the stated function and several drawbacks which has been corrected in the present innervation. First, because of the size and location of the valve, in the narrowest diameter of the catheter, the passageway becomes very susceptible to blockage. Second, the valve is located within the

patient allowing the potential of drained material flow into the patient. Finally, if this valve configuration is used in a double or single lumen design, the catheter cannot be used for irrigation because the valve would block the flow of injected irrigation fluid.

Therefore this new device has been planned to keep the valve outside of the catheter that will help to clean the catheters whenever necessary and this low cost device can be replaced when it will be needed.

Another art of catheter invention provides a novel construction for a catheter that includes backflow prevention in the form of a check valve (US 7331949 B2). Moreover some new catheters design that provides distal valve system and the drained fluid may always remain in the drainage container for several hours allowing the growth of harmful bacteria. There is therefore this new catheter design that provides for a backflow prevention that does not allow the flow of drained material to re-enter the body of the patient while also providing a positively locking assembly that further facilitates the delivery of irrigation to the patient should the need arise. In addition it provides drainage system without the drainage container and compression lock without being susceptible to blockage or narrowing of the tube lumen and keeping away from the potential of drained material for flowing into the patient and remaining for long duration.

In addition another art, a Tru-flo-equipped catheter can be drained directly into a commode at the convenience of the patient. The valve universally adapts to all Foley and Supra-pubic catheter systems. (Tru-Flo-Catheter-Valve/show/1329359). By eliminating the bag and utilizing shorter catheter tubing, the entire catheter system is easily concealed by the Tru-flo valve which has been insured that it is helping to restore patient comfort and dignity. However this new invention does not interfere directly the catheter as the out let is placed distance to the catheter end where it is connected to the Catheter tube. To reduce commercial flora contacts to the outer distal orifice of the catheter, there is an extended catheter tube in this device which drain urine to the distal orifice of the tube before it is discharged. Meanwhile two valves are fixed to the Catheter tube to stop back flow of urine to the bladder and it will reduce propagation of microbes upwards through the tube and connect with commensal bacteria flora through the catheter tube.

Therefore this new invention will help to many patients to reduce urinary infections as well. To stop the dislodging of Catheter content while the tube is in the hanger the catheter side lock valve is firstly to be clamped and the tube may be kept straight facing the downwards when it is used.

On the other hand if this device is for a patient who needs continuous urine out flow or to keep the bladder empty (e.g. trauma, surgical trauma or part of surgical procedure) or high flow out (e.g. diabetes insipidus), here the catheter is placed to drain to a mini urinary bag firstly. Thus in this diversion of new device the catheter tube is designed as a form a synthetic bladder outside of human bladder named external pubic bladder (EPB) to which urine is

pumped out by mechanical or electrical unit from mini catheter bag hanging in the catheter tub hanger. This form of EPB is emptied through a side tap valve or form of artificial part like penis made by plastic or rubber or any other low weight healthy material.

The other advantage of the innovation is to avoid many discomforts arising due to keep catheter connected its bag for long time. Many male patients are more depressed due to lack of past social life and micturition behavior. There is therefore a need for a new catheter design that provides for relieving that discomfort and uneasy feeling of the patients who live in their family and social events. In addition, patients get many economic problems due to catheter holding social life in the world. Therefore, another new approach is essential to reduce cost effects to the new apparatus and allow the patient to start normal function without stop many of their day to day work and spending their working hours for a simple matter that can be stopped by simple catheter tube or EPB device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram showing the inner arrangement of catheter tube hanger [1A], inner opening, catheter mount[3], hardboard[1B], in a catheter tube hanger according to the invention.

FIG. 2 is a diagram of catheter end connected [5] to the urine passing tube. the tube containing urine control tap or valve controller[6], cleaning hole [], tube holder part [], second valve [9], distal opening (10B) ,its outer cap(10A)].

FIG. 3 is a diagram of a catheter placed in the mount ,two catheter tube valve , a distal and ,proximal plaster or clips[11 A,B,C] ,Tube connection to catheter end [4A] and catheter tube holder in a device according to the invention.

FIG. 4 is a diagram of the initial part of the catheter in the garment connected to the pressure sensor, battery ,circuits,[12] and vibrate[13] to a spontaneously alarming to the filled stage of the bladder o/and EPB[21] .

FIG. 5 is a diagram of the initial part of the catheter in the garment connected to the pressure sensor, battery, circuits, and vibrates[16] to a spontaneously alarming sensor[16] to the filled stage of the mini bladder [14].The same is a diagram showing the mini catheter bag ,pumping tubes[15,19] and motor[17] and energy supply battery [18]and external pubic bladder (EPB) [21]and out let of the EPB[22] and volume sensor of the EPB[20-20 a, b]

FIG. 6. Is a diagram showing the front outer arrangement of catheter tube or/and mini catheter tube hanger and EPB hanger, cross and horizontal ships[23-25].

DETAILED DESCRIPTION

Referring now to the drawings, the novel catheter construction of the present invention is illustrated and generally indicated from FIGS. 1-6.

Turning now to FIG. 1 and 6 ,the catheter tube hanger has an inner covering part and outer covering part. The inner covering part includes at least one inner opening[2], catheter tube or EPB mount, hard board according to the invention

The hanger will be formed from a single leather/cloth material and outer covering from transparent material such as silicone or a natural latex rubber. The hard surface to mount all the contents is formed as a narrow lower portion of the triangle plate to mount catheter tube or EPB on hard surface . The inner opening [2] facilitates to insertion of the catheter tube or pumping tube trough outer part into the hanger. For example, in the case of the present invention the catheter end [4 A] is connected to the catheter tube which is rounded up and kept in the mount allowing to catheter tube or EPB in situ in the ganger .The catheter is used in the invention only from the external urethral opening to the attachment to the catheter bag. Therefore there is 2.5 cm space in which the contents are kept and fixed. At least one opening [2]

is provided at the inner part of the garment to allow catheter tube [5] or pumping tube (19) from the external catheter to enter the inside of the designed hanger. The middle part of the catheter tube mount the hanger (1B) allowed placing the catheter tube or EPB (21) and their valve connects (3). The upper lateral ends of the hanger are connected together and lower end is connected to the back upper part of the hanger with strip elastic ribbon. The hanger is wore in front of the normal underwear of the patient and designed to hang comfortably. The borders of the hanger are designed without disturbing to the leg or hip movement.

The FIG-6-Outer covering of the garment has vertical zip and horizontal zip [23, 24, 25] to be opened the hanger. In addition this hanger has been designed so that the contents in the inner part are not compressed with keeping stretchable space. Additional upper part of the thigh is selected to hold the mini catheter bag (14).

Turning to FIG-.02 and 03. The catheter tube consists of proximal opening (5) connected or fixed to catheter end (4A), first tap valve (06), the cleaning hole [07], tube holder (08), second valve (9), distal opening (10B), its outer cap (10A). After urine is passed, beyond the proximal tap valve up to distal end of the catheter tube can be washed out using water or any disinfected fluid passing through the cleaning hole and then cap of the hole is kept in locked position. This hole helps to total emptying of the urine in the tube. This short catheter tube is placed or mounted in the hanger by three detachable plaster (11A, B, and C) that has been shown in figure 03.

The enlarged part (09) of the catheter tube is designed so that patient can hold it comparably. The tubular catheter has a hollow passageway on its interior with an inlet end [5] that is inserted into the catheter end that allow the fluid in the cavity to enter into the hollow passageway when the tap valve is opened [10] and flow through the catheter tube to ultimately exit on the outlet end [10B] as normal urethral opening and allowing to pass urethra to outside places such as commode or toilet hole. The drainage passageway includes the two – one -way check valve as described above to prevent the backflow of the drainage material. In addition, however, this embodiment also includes a separate open and closed valve [09] which is used to close the tube after urination.

Moreover, turning to the FIG.4 an alternate pressure sensor of the present invention is shown that is particularly suited for use as bladder filled with adequate level that needs to be emptied. Some of the patient's condition such as atonic bladder or lack of sensation of bladder may require the introduction of pressure sensor in the proximal part of the catheter [4A]. On the other hand it is attached to the catheter inflating unit where there is directly pressure of human bladder [when the bladder is well filled stage]. The sensor is connected to the battery and monitor or circuit [12] and then to the vibrate alarms [13] which is positioned on the skin in the abdomen or thigh or other area where sensation is intact.

Turning to FIGS. 05. The another alternate embodiment of the present invention is shown in the form of Mini catheter bag [14] which is fixed or tied to patient's upper thigh. The catheter end [

4A] is connected to the mini catheter bag [14]. It ends at the catheter bag upper end and backflow of urine is controlled by one way valve. The urine collected in two levels and the lower level is connected with External pubic catheter bag [EPB] through pumping tubes [18-19]. This catheter mini bag is connected to the EPB [21] through pumping tubes [19] assisted with pumping mechanism operated by a motor [17], powered by a rechargeable battery (18). The light sensor [16] is attached to sense the low volume level [peripheral level in the mini bag] and send the impulse to the monitor to generate sound or bulb or vibrate alarms [16]. This is useful in patient who has no sensation of bladder pressure or to detect low volume of urine due to some renal problem or inadequate intake. The monitor of the pumping circuit has been calculated for time interval with certain fluid level.

The motor is adjusted to activate the pumping mechanism to remove the collected urine in the mini bag in to the EPB [21] on adjustable fixed time interval. The motor [17a] which is connected to the mini bag through another pumping tube [15] is powered by battery circuit [18]. The motor pumping outlet is connected to the EPB [21]. The energy supply is to the motor via rechargeable battery [17] or other alternative way. The impulses from the volume sensor and monitor to the mini catheter bag is transmitted to the motor monitor [16]. Another volume sensor 20 a, b and c) also is attached to the EPB to give vibration [20 b] sensation to the patient when the EPB is filled with urine adequately (depend on size of the EPB). When the bladder filled in a certain time the vibrator is designed to operate and it makes sensation to arouse feeling of passing urine. Then the outer valve [22] can be released and allowed to flow urine in to toilet or other desired place.

It can therefore be seen that the present invention provides a novel catheter construction that enhances the safety for both the patient and the user by preventing the potential of the backflow of drained fluids back into the patient through the use of one tap valve and preventing the accidental dislodgement of the catheter which is mounted on the hanger. Further, the present invention insures that in a backflow condition it means that no backflow material will reenter the interior of the patient's body at any point. Moreover Over suction by motor in no urine level in the mini bag is prevented.

The pumping mechanism works keeping urine outwards direction of the internal body. This would help for the reduction of infection rate due to CAUTI.

In addition such microbiological factors this under garment facilitates to avoid many discomfort and morbidity created by normal catheter and catheter bag which should be carried by patients even though he can walk well. For these reasons, the instant invention is believed to represent a significant advancement in the art, which has substantial commercial merit.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the parts may be made without departing from the spirit and scope of the underlying inventive

concept and that the same is not limited to the particular forms herein shown and described except insofar as indicated by the scope of the appended claims.

SUMMARY OF INVENTION

In this regard, the present invention provides for a novel construction for a catheter that provides backflow prevention in the form of a valve that keeps the flow of drained fluid material from reentering the patient. It is an important feature of the present invention that the valve is provided as close to the terminal end of the catheter as possible without interfering with the necessary accessory attachment that is typically made thereto. The valve is located at the first in this location, the valve material can form a positive seal preventing any back flow of fluid because it is placed in a portion of the lumen tube with sealing effect. This effect may be enhanced by further providing a seat structure around the interior of the bore against which the flap would come to rest in a backflow condition.

The second advantage provided by placing the valve in this particular position is that it is located physically outside the patient body when the catheter is placed in the operable position. In this manner, the catheter construction insures that not only will the backflow of drained fluid be prevented, but backflow along the entire length of the entire catheter is also prevented in contrast to the devices of the prior art. Another advantage of the present invention is that when employed in a single lumen the valve is located at a point well outside the body of the patient and cleaning hole in the tube. In this manner, a second entry port into the drainage lumen at a point upstream from the valve may be provided if desired to allow irrigation through the catheter as has been previously unknown in the art. With the prior art devices of this type, the only way to facilitate irrigation is through the use of a triple lumen catheter. This is because in the prior art the valve was located at the insertion end of the catheter, well within the body of the patient, where it would be impossible to introduce an additional entry port upstream from the check valve.

Finally, since the valve of the present invention is located in a section of the lumen where the cross sectional area is larger, it is less likely to become clogged by for example, crystals that may be suspended in the patient's urine.

Accordingly, one of the objects of the present invention is the provision of a novel catheter construction that provides protection against the backflow of drained fluid. Another object of the present invention is the provision of a novel catheter construction that prevents that backflow of drained fluid from reentering the body of the patient being treated. A further object of the present invention is the provision of a catheter construction that can be employed equally with the various types of existing catheter configurations to prevent the backflow of drained fluid while further allowing the use of the distal central lumen for irrigation if necessary. Yet a further object of the present invention is the provision of a catheter construction that prevents the backflow of drained fluid air or susceptibility to invade normal bacterial flora while including a positive interlocking mechanism for the attachment of accessories such as out let object for passing urine and urine collection EPB.

Other objects, features and advantages of the invention shall become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawings.

CLAIMS

1. A device for removing body fluids comprising an assembly of a central fluid discharging channel connected to plurality of valves
2. The device as claimed in claim 1 wherein the central fluid discharging channel is equipped with a channel cleaning access.
3. The device as claimed in claim 1 wherein the device is an externally connectable assembly to a urinal catheter.
4. A wearable hanger comprising a cavity to hold the device claimed in claim 1.
5. The device as claimed in claim 1 wherein one end of the device is inserted into a catheter connected to a human body to drain fluids contained in said cavity, said second end and said plurality of valves stay entirely outside said human body.
6. An external pubic bladder (EPB) comprising of a short catheter tube , a mini catheter bag , a urine pumping tube and a pumping motor with volume sensors and drip detection sensors .
7. A wearable External Pubic Bladder (EPB) wherein the said wearable EPB is composed of a EPB as claimed in claim 6 and a hanger.
8. A wearable EPB as claimed in claim 7 wherein the said wearable EPB further comprising a volume sensor for preventing over filling of mini urine bag and EPB, and drip detecting sensor for alarming low or non fluid drain.
9. A composite wearable EPB wherein the said composite wearable EPB is composed a wearable EPB as claimed in claim 6 and connected to fluid removing device as claimed in claim 1.