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[Continued on next page]

(54) Title: A CATHETER ASSEMBLY

(57) Abstract: A catheter assembly (1) comprising a catheter (8) having a proximal end (10) adapted to be inserted into a bodily cavity and a distal end (11) having a drainage outlet (13), a catheter package (2) having a cavity for accommodating the catheter and an opening for withdrawing the catheter from the package, and extracting means (17) that are coupled to the catheter for extracting the distal end of the catheter out of the package.

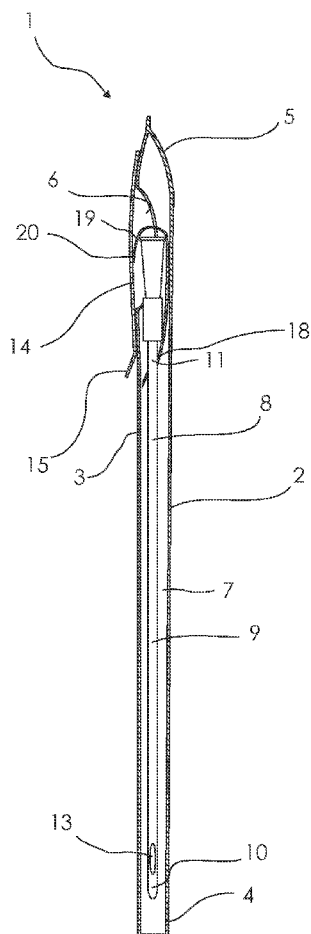


Fig. 1



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## A Catheter Assembly

The invention relates to a catheter assembly comprising a catheter having a proximal end adapted to be inserted into a bodily cavity and a distal end having a drainage outlet, a catheter package having a cavity for accommodating the catheter and an opening for  
5 withdrawing the catheter from the package.

## Background

Catheters or especially intermittent urinary catheters are medical devices that are used to drain urine from the urinary bladder in situations where the users are not capable of voiding their bladders or where users have afflictions that cause problems in emptying  
10 their bladders.

Intermittent urinary catheters are often single use catheters that are provided with a lubricant, such as a gel lubricant, or the catheters may be provided with a surface coating that provides a low-friction surface on the catheter, such as a catheter having a hydrophilic coating. A frequent side effect of using catheters, including single use  
15 catheters is that users have a higher risk of getting a urinary tract infection, which may often be caused by bacteria that come into contact with the catheter prior to insertion. In an attempt to reduce the risk of contracting a urinary tract infection, single use catheters are often provided in sterile packages that maintain the catheters sterile until the user intends to use the catheter and opens the package.

20 When a sterile catheter package has been opened, there are a number of different scenarios the user may have to face. If the catheter is a gel lubricated catheter, the user has to withdraw the catheter and apply the gel to the surface of the catheter prior to insertion. In a different situation, where the catheter is a dry hydrophilic catheter, the user has to pour water into the package for activating the coating and then withdraw the  
25 catheter from the package. In another situation, where the catheter is a ready to use catheter, the user withdraws the catheter from the package and prepares for insertion.

The conventional catheter packages are usually provided in the form of one or two sheets of film that has to be opened to access the catheter. This means that the user is forced to handle the catheter before use in order to withdraw the catheter from the package.

A large group of users of intermittent catheters are persons that have reduced motor skills, as they may have lost voluntary bladder control due to illnesses, such as spina bifida, or accidents that have caused damage to the spinal cord, resulting in either para- or tetraplegia. This group of users may have a reduced dexterity in their hands or fingers and may often struggle with the preparation and/or withdrawal of catheters from their packages, which may further lead to the contamination of the catheter due to the lack of control of their hand or finger movements.

### ***Description of related art***

Patent document DE 2005 20009947 U discloses a catheter assembly comprising a package and a catheter, where the proximal end (insertable end) is pulled out of the package using a string that is attached to the distal end of the catheter, where the package is used as a urine container and the user does not have to touch the insertable part of the catheter before inserting the catheter. However, the use of such a package requires that the package is attached to the distal end of the catheter, as the user is not to touch the catheter.

### **Summary of the Invention**

The invention concerns a catheter package having extracting means coupled to the catheter, so that it gets easier for the user to remove the catheter from the package. Many catheter users have poor or at least reduced hand dexterity and may lack the ability to pinch with the fingers. They will therefore find it difficult to grab and seize hold of a distal end of a catheter (e.g. a connector), when the catheter is to be removed from the package. Thus, the invention provides a catheter assembly, which, among other objects, alleviates the above problem.

### **Detailed Description of the Invention**

In a first aspect, the invention relates to a catheter assembly comprising a catheter having a proximal end adapted to be inserted into a bodily cavity and a distal end having a drainage outlet, a catheter package having a cavity for accommodating the catheter and an opening for withdrawing the catheter from the package, and extracting means that are coupled to the catheter for extracting the distal end of the catheter out of the package.

The extracting means may be used to assist the user in extracting the catheter from the package, as some users have reduced hand or finger dexterity and it might be difficult for the users to operate the package, so that the distal end is accessible. This may be

especially advantageous when the catheter package is of the kind where the package is formed in such a manner that the opening of the package only partly exposes the distal end of the urinary catheter. When the distal end is only partly exposed the user may be required to fold, bend, cut or stretch the package, so that the distal end becomes

5 exposed, or the user may have to insert fingers into a small opening to access the distal end. The extracting means according to the present invention are advantageously readily accessible to the user, so the user may pull the distal end of the catheter out of the package prior to the complete extraction of the catheter from the package. By pulling the distal end out of the package, the distal end becomes fully accessible to the user, and

10 even users having reduced dexterity will be able to grab the distal end, so that the catheter may be fully extracted from the package.

In the following, whenever referring to a proximal end of an element of the invention, the referral is to the end adapted for insertion. Whenever referring to the distal end of an element, the referral is to the end opposite the insertion end. In other words, the proximal

15 end is the end closest to the user, when the catheter is to be inserted and the distal end is the opposite end – the end furthest away from the user when the catheter is to be inserted. The same definitions apply to the package and container – the proximal end is the end storing the proximal end of the catheter and the distal end is the opposite end.

The longitudinal direction is the distal to the proximal end. The transverse direction is the

20 direction perpendicular to the longitudinal direction, which corresponds to the direction across the shaft of the catheter.

The catheter described in this application may be used as a urinary catheter.

The catheter comprises a main tubular part extending from the distal end to the proximal end. The tip is positioned in the proximal end of the catheter and is provided as a rounded

25 closed end of the tube constituting the main part of the catheter. The catheter may comprise a connector in the distal end and may in an embodiment comprise a flared end of the catheter, so that the diameter of the connector increases with respect to the tubular part. The catheter may also comprise a handle in the distal end, which has a length allowing the user to manipulate the catheter.

30 Usually catheters are from size 8 FR to size 18 FR.

Catheters of this invention may prior to use be provided with a hydrophilic coating so as to impart a low-friction insertion.

The hydrophilic coating may be provided only on the insertable part of the catheter. The hydrophilic surface coating is of the kind which, when hydrated or swelled using a swelling  
5 medium, reduces the friction on the surface area of the catheter which is intended to be inserted into the urinary channel of a user corresponding to the insertable part of the catheter.

An intermittent hydrophilic catheter differs from an indwelling catheter in that the hydrophilic surface coating of such a catheter is not suitable for indwelling use, because  
10 the surface coating tends to stick inside the mucosa of the urethra if left inside the body for a period exceeding 5-20 minutes, due to the hydrophilic coating transforming from being highly lubricious when fully wetted (95% weight water) to being adhesive when the hydration level of the coating is reduced (<75% weight water).

The catheter package may comprise a medium for activating the hydrophilic surface  
15 coating of the catheter. The activating medium may be a water based substance, such as sterile water, saline-solution, or any water based liquid. Furthermore, the activating medium may be in the form of a vapour contributing material, such as a wetted sponge, woven or non-woven material comprising a vapour contributing liquid. By introducing a vapour contributing material into the package, the vapour will over time hydrate the  
20 hydrophilic coating ensuring that the coating is activated and that the hydrophilic coating provides a low-friction surface for the catheter.

In one embodiment of the invention, the drainage outlet may have a cross sectional diameter that is larger than the part of the catheter proximal to the drainage outlet. In this way the coupling between the catheter and the extracting means may be in the form of a  
25 frictional coupling or similar that utilizes the increased diameter of the catheter. Thus, the coupling part will stop in the vicinity of the drainage outlet and will not pass the drainage outlet and by pulling onto the extracting means the coupling will transfer the pulling force to the catheter and the catheter will be lifted using the extracting means.

In one embodiment of the invention, the extracting means may be arranged in a distal end  
30 of the catheter package. By arranging the extracting means in the distal end of the package, the catheter may be extracted out of the package along the longitudinal axis of the package. This means that the package may be opened in the distal end using a

predefined opening in the package material or peel opening of a film layer package. Thus, when the extracting means are in the distal end of the package, the opening may be formed in such a way that the opening only disposes a part of the distal end of the catheter or no part of the distal end of the catheter and the distal end of the catheter is exposed when the extracting means are used to pull the catheter from the package. This simplifies the design and production of the catheter package, as the package does not need to have an opening having complex features that expose the distal end of the catheter when opened.

In one embodiment of the invention, the extracting means may be coupled to a part of the catheter that is distal to the proximal end and proximal to the distal end. This means that the extracting means are coupled to the catheter at different areas than the extreme end of the catheter, which means that the important parts of the catheter, such as the insertable tip or the drainage outlet are not blocked by the coupling part of the extracting means.

In one embodiment of the invention, the extracting means may be coupled to a distal part of the catheter that is approximately between 50 – 99 percent of the length of the catheter. Thus, the extracting means may be arranged to assist in pulling onto the distal end of the catheter. When the extracting means are pulled in a longitudinal direction away from the distal end, the transfer of the force from the extracting means to the catheter will have a balancing point that is in the distal half of the catheter and the risk of tipping the catheter while pulling onto it is minimized.

In one embodiment of the invention, the extracting means may be in the form of a strip that has at least a length that extends from a proximal end coupled to a coupling area of the catheter and a distal end abutting the opening of the catheter package. This means that when the catheter package is opened, the extracting means are readily accessible for the user at the package opening. Thus, after opening the package, the user may grab onto the extracting means and pull onto the extracting means to expose the distal end of the catheter, so that the distal end of the catheter may be gripped by the user for insertion. In other embodiments of the present invention, the distal end may be arranged to extend beyond the package opening, so when the package is opened the extracting means will extend beyond the opening.

In one embodiment of the invention, the extracting means may be in the form of a strip having a proximal end that surrounds the catheter and a distal free end. The strip may

surround the catheter in such a way that when the extracting means are manoeuvred in a direction away from the distal end of the catheter, the force of the movement will be transferred to the catheter. Furthermore, when the user grabs the distal end of the catheter and pulls the catheter in a direction away from the extracting means, the extracting means will release its coupling to the catheter and the catheter will move in a free manner relative to the extracting means. This means that when the user manoeuvres the catheter from the package, the extracting means will release the catheter and the extracting means may remain inside the package while the catheter is being pulled out of the package.

10 In one embodiment of the invention, the proximal end of the strip that surrounds the catheter may have a diameter that is smaller than at least the distal end of the catheter. This means that when the extracting means are pulled, the extracting means will not slide off the catheter, as the reduced diameter will prevent the catheter from sliding off the extracting means.

15 In one embodiment of the invention, the opening of the catheter package may be provided with openable closing means that seals off the cavity of the catheter package from the ambient space. This means that during storage and prior to use the closing means will close off the catheter package, so that the catheter cannot be accessed by the user or by any outside contaminants. These closing means may be in the form of a plug, peel off opening means, or similar.

In one embodiment of the invention, the extracting means may be coupled to the openable closing means. By coupling the extracting means to the openable closing means it is possible to expose the distal end of the catheter in one simple movement, i.e. the opening of the package. Thus, when the closing means are pulled from the package, the pulling movement will transfer to the extracting means and via the extracting means to the catheter. This may be advantageous for users that have low dexterity in their fingers or hands, as the one movement of the closing means has a double function, i.e. opening the package and exposing the catheter for removal from the package.

30 In one embodiment of the present invention, the end of the extracting means may be coupled to the package. By coupling the extracting means to the package the extracting means may be fastened to the package in such a way that the extracting means may lift the distal end of the catheter from the opening of the package and that the extracting



means will not be releasable from the package and the extracting means will therefore not be removable from the package, without the use of excessive force.

In one embodiment of the present invention, the end of the extracting means may be displaceably coupled to the package, so that the extracting means may be manoeuvred in a longitudinal direction along the longitudinal axis of the package, while the extracting  
5 means are coupled to the package. This means that the extracting means will slide along the package until the distal end of the catheter has been exposed and upon exposure the extracting means will remain in its position while the catheter is being extracted.

In one embodiment of the present invention, the closing means may be provided with fastening means for fastening the closing means to a surface area. This means that the  
10 closing means may be attached to a surface and the opening means may be directly coupled to the package or coupled to the extracting means, so that the attached closing means may support the entire weight of the catheter assembly. This allows the user to position the catheter assembly at a location where he can have an easier access for  
15 extracting the catheter from the package, as the user does not have to hold the catheter assembly in his hands or put it away before catheterization, as the assembly is already arranged at a location away from the user.

## Brief Description of the Drawing

In the following drawings the invention is explained in further detail where,

20 Fig. 1 is a side sectional view of a catheter assembly according to the present invention in a closed state,

Fig. 2 is a side sectional view of a catheter assembly according to the present invention in an opened state,

Fig. 3a and 3b are perspective views of a distal end of a catheter package seen from the  
25 front and the back, respectively,

Fig. 4 is a perspective view of a distal end of a catheter package seen from the front, where the package has been opened, and

Fig. 5 is a perspective view of the same, attached to a surface area of a sink.

## Detailed Description of the Drawing

Fig. 1 shows a sectional side view of a catheter assembly **1**, where the catheter assembly is in the form of a catheter package **2** having a side wall **3**, a proximal end **4** and a distal end **5**, where an opening **6** in the side wall **3** is arranged close to the distal end of the catheter package. The catheter package **2** has an internal cavity **7** for holding a catheter **8**. The catheter package is advantageously provided in a material that is flexible, so that the side walls of the package may be bent and flexed.

The catheter **8** is a conventional intermittent urinary catheter, having a catheter tube **9** for draining urine from the urine bladder of a user where a proximal end **10** of the catheter **8** is adapted to be inserted into a body cavity of a user. The opposite end of the catheter **8** the distal end **11** is provided with a connector **12** which acts as an outlet for urine drained through the catheter tube **9** and is in fluid communication via an inner lumen of the catheter tube **9** to at least one eyelet **13** arranged close to the proximal end of the catheter **8**.

The opening **6** provides an entry into the internal cavity **7** of the catheter package **2** and when the catheter assembly is in its closed configuration, as shown in this figure, the opening **6** is sealed off using a closing means in the form of a peel-off tab **14**. The peel-off tab **14** sealingly closes off the opening **6** by being bonded to the side wall **3** of the catheter package at the periphery of the opening **6**. The tab **14** is provided with a gripping portion **15** that may be arranged in such a way that the user may easily grab onto the gripping portion, using his fingers, or it may be provided with a finger hole into which the user may insert his finger to get a firm hold of the gripping portion **15**. The tab **14** is releasably bonded on the major part of its periphery to the side wall **3** of the package **2**, while in an area **16** that is close to the distal end **5** of the package **2**, the tab **14** is bonded more firmly, so that the tab **14** stays on the package **2** in the area **16** after the tab has been peeled off the opening of the package **2** to provide access to the inner cavity **7** of the package **2**.

The catheter assembly is further provided with an extraction member **17** that at one end **18** arranged around the distal end **11** of the catheter tube **8** and at the other end **19** attached to an inner wall of the peel-off tab **14** at attachment zone **20**. The extraction member **17** mechanically couples the peel off tab **14** to the distal end **11** of the catheter tube **8**, so that when the peel-off tab **14** is pulled off the package **14** the extraction member pulls onto the distal end **11** of the catheter tube **8** and pulls the connector **12** out of the package, so that the user has easy access to the catheter connector **12** in order to

withdraw the catheter from the package before use. The opened position of the catheter assembly is shown in Fig. 2. The extraction member thus displaces the catheter in a longitudinal direction, lifting it up from the internal cavity of the package, so that the distal end of the catheter is easily accessible by the user.

- 5 The extraction member **17** is advantageously arranged behind the connector, as shown in Fig. 1 and 2, in that the extraction member passes the connector inside the cavity close to the side wall of the package that is opposite the opening of the package. This means that when the peel-off tab **14** is opened in a manner as shown in Fig. 2 that is pulled in a distance away from the package, tension is applied to the extraction member and the
- 10 centre of the extraction member pushes the connector out of the opening in the side wall in a direction that is orthogonal to the longitudinal axis of the catheter package. In related embodiments it is not the exact centre of the extraction member that pushes the connector out of the opening but rather a position near the centre of the extraction member.
- 15 Fig. 3a depicts another embodiment of the present invention, in perspective view seen from the front, showing a distal end **102** of a catheter assembly **101**. The distal end **102** of the catheter assembly **101** is provided with an opening **103** providing access to the inner cavity **104** of the catheter assembly **101**. In this embodiment, the opening **103** is provided in the extreme distal end of the catheter package, giving unhindered access in a
- 20 longitudinal direction to the inner cavity **104** of the catheter package. The opening **103** is closed off using a cap **105**, which sealingly closes off the opening **104** in at least a liquid tight manner, and possibly in a gas impermeable seal as well. The cap **105** is provided with a gripping member **106** in the form of a protrusion that facilitates the gripping of the cap **105** in order to push the cap **105** from the opening. Furthermore, the cap **105** may be
- 25 provided with an adhesive area **107** that is arranged on the outer surface of the cap **105** in order to attach the outer surface of the cap **105** securely to a surface area of a sink, table, or similar structures available to the user when using the catheter assembly **101**.

- The distal end **102** of the catheter assembly is arranged in a funnel shape, so that the distal end has an inner diameter that is wide enough to hold a connector end **108** of a
- 30 catheter **109** and to facilitate that the entire catheter may be arranged inside the catheter package. In this embodiment, the catheter **109** is further provided with an insertion aid **110** that is slidingly arranged around the catheter **109** and the catheter connector **108**, so that the insertion aid may be manoeuvred in along the longitudinal axis of the catheter **109**

during insertion of the catheter **109** into the body. The insertion aid **110** is in form of a generally tubular element arranged coaxially exterior of and around the catheter **109**.

As shown in Fig. 3b, which is a perspective view from the back, the catheter assembly is further provided with an extracting means **111** which is in the form of a flexible strip **111** that is in one end **112** securely attached to the cap **105** and in the opposite end **113** is coupled to the insertion aid **110**, so that the opposite **113** end is looped around the insertion aid **110**. This means that the cap **105** is mechanically coupled to the distal end of the catheter **109** or the catheter connector **108**, so when the cap is removed and manoeuvred in a direction away from the package, the extraction means will transfer the force from the cap to the catheter, causing the catheter to lift from the opening, giving the user access to the distal end of the catheter for the removal of the catheter from the catheter assembly, as shown in Fig. 4.

The opposite end **113** of the extracting means or the flexible strip may in a different embodiment be arranged around the catheter **109** or the connector **108** of the catheter, in embodiments where the insertion aid is not required or in embodiments where the insertion aid is arranged in a different manner.

As shown in Fig. 5, when the catheter assembly **101** has been opened, the adhesive area of the cap **105** may be used to secure the cap **105** to the surface area of a sink **114**, so that the cap holds the catheter **109** and the catheter assembly **101** in easy reach for the user to extract the catheter **109** from the opening **103** by gripping the distal end or the connector **108** of the catheter. Thus, the user may prepare the catheter assembly for use by removing the cap from the catheter assembly, and the removal of the cap will cause the extracting member to pull onto the catheter, so that the catheter lifts from the catheter assembly, making the catheter easy to reach and easily gripped by the user.

Within the meaning of the present invention, any features that are shown in one embodiment may be applied to a different embodiment of the invention, such as the form and shape of the extracting member. Furthermore, the embodiments shown in the present invention may be adapted, so that the extraction member is not attached to the opening means of the package, but may be arranged separately inside the package, so that the user may open the package, and afterwards reach into the package to grab onto the extraction member to lift the distal end of the catheter from the package.

## Claims

1. A catheter assembly comprising
  - a catheter having a proximal end adapted to be inserted into a bodily cavity and a distal end having a drainage outlet,
- 5     – a catheter package having a cavity for accommodating the catheter and an opening for withdrawing the catheter from the package, and
  - extracting means that are coupled to the catheter for extracting the distal end of the catheter out of the package.
2. A catheter assembly according to claim 1, wherein the drainage outlet has a cross  
10     sectional diameter that is larger than the part of the catheter proximal to the drainage outlet.
3. A catheter assembly according to any of the preceding claims, wherein the extracting means are arranged in a distal end of the catheter package.
4. A catheter assembly according to any of the preceding claims, wherein the extracting  
15     means are coupled to a part of the catheter that is distal to the proximal end and proximal to the distal end.
5. A catheter assembly according to any of the preceding claims, wherein the extracting means are coupled to a distal part of the catheter that is approximately between 50 – 99 percent of the length of the catheter.
- 20   6. A catheter assembly according to any of the preceding claims, wherein the extracting means is in the form of a strip that has at least a length that extends from a proximal end coupled to a coupling area of the catheter and a distal end abutting the opening of the catheter package.
7. A catheter assembly according to any of the preceding claims, where the extracting  
25     means are in the form of a strip having a proximal end that surrounds the catheter and a distal free end.
8. A catheter assembly according to claim 7, wherein the proximal end of the strip that surrounds the catheter has a diameter that is smaller than at least the distal end of the catheter.

9. A catheter assembly according to any of the preceding claims, wherein the opening of the catheter package is provided with openable closing means that seals off the cavity of the catheter package from the ambient space.
10. A catheter assembly according to claim 9, wherein the extracting means are coupled  
5 to the openable closing means.
11. A catheter assembly according to any of the preceding claims, wherein the extracting means are coupled to the package.
12. A catheter assembly according to any of the preceding claims, wherein one end of the extracting means are displaceably coupled to the package.
- 10 13. A catheter assembly according to any of claims 10 - 12, wherein the closing means are provided with fastening means for fastening the closing means to a surface area.

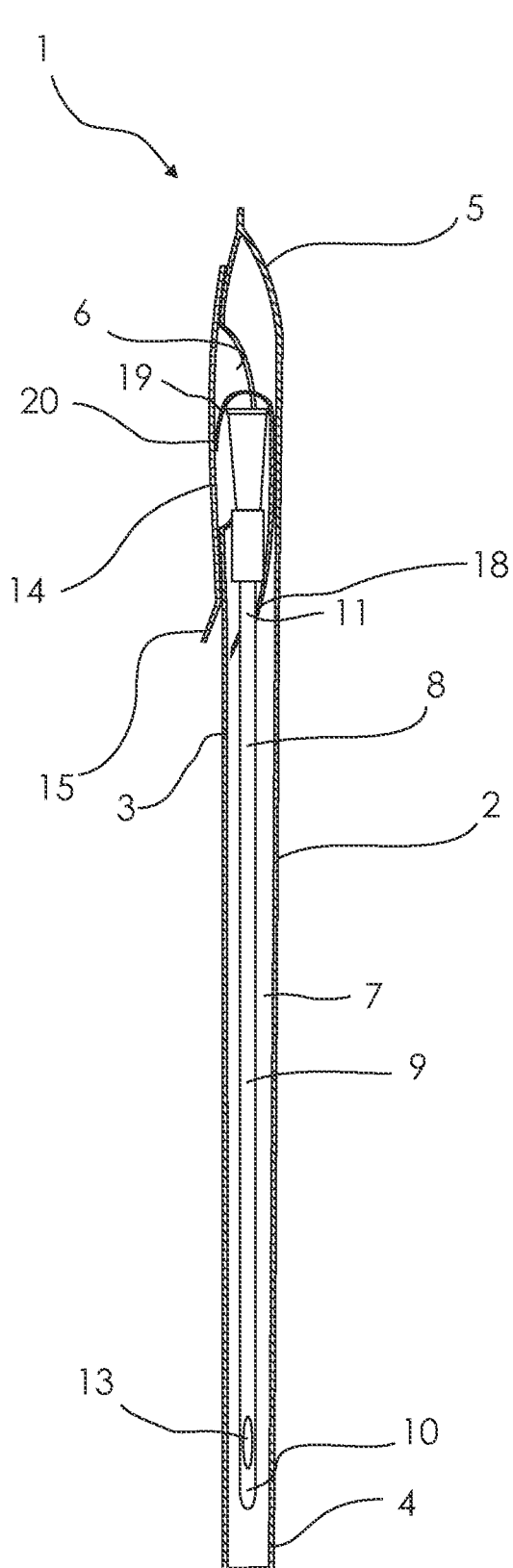


Fig. 1

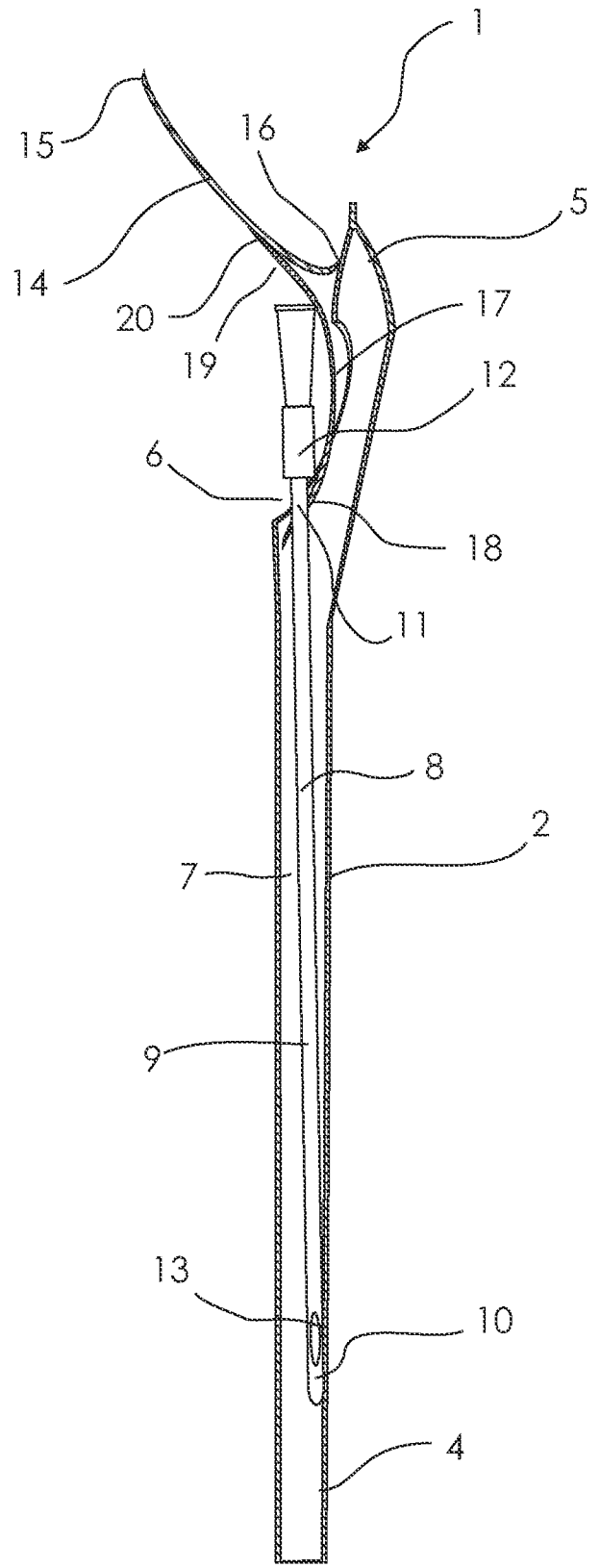


Fig. 2

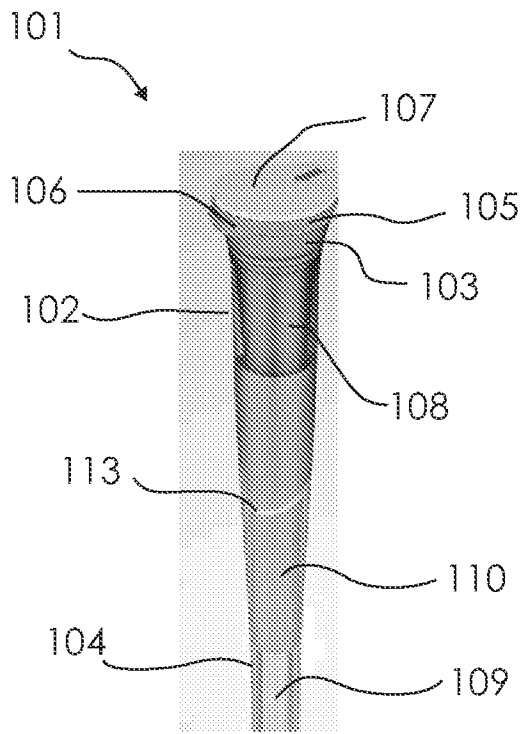


Fig. 3a

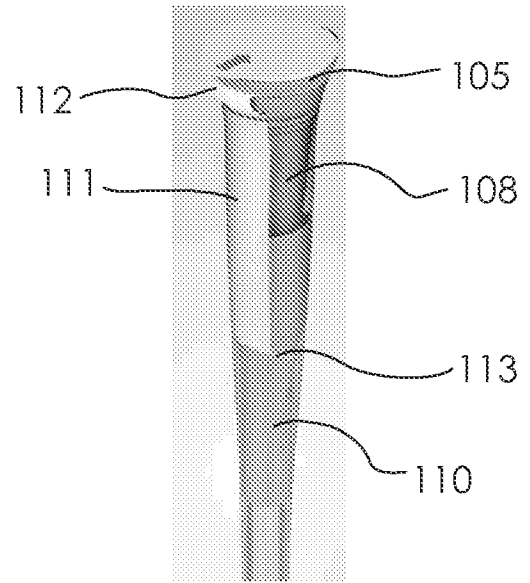


Fig. 3b

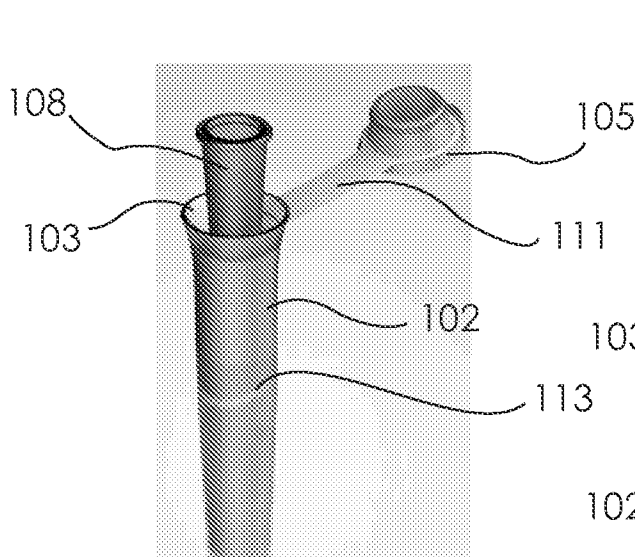


Fig. 4

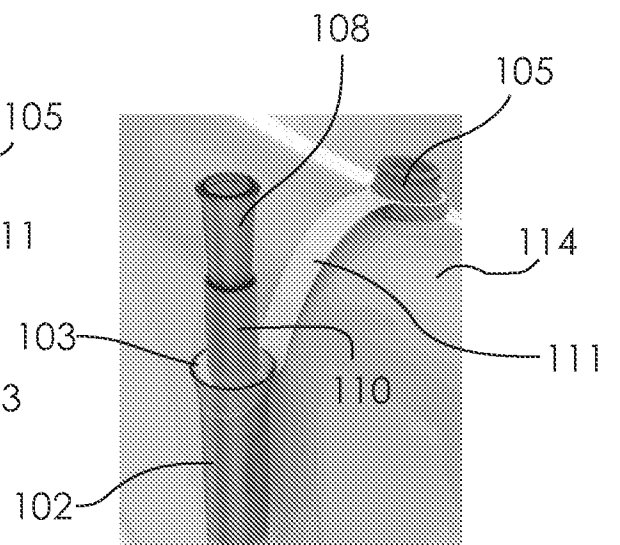


Fig. 5



**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/DK2012/050080

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. A61M25/00 B65D83/02  
 ADD. A61M25/01

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 A61M B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 2005 009947 U1 (MEDICAL SERVICE GMBH [DE]) 15 September 2005 (2005-09-15) cited in the application	1-3,9-13
A	figures 1, 2 paragraph [0001] paragraph [0024] paragraph [0025]	4-8
A	----- US 5 765 682 A (BLEY BOB [US] ET AL) 16 June 1998 (1998-06-16) figures 1-7c column 4, line 65 - column 7, line 33	1-13
A	----- US 2003/060807 A1 (TANGHOJ ALLAN [DK] ET AL) 27 March 2003 (2003-03-27) paragraph [0079] - paragraph [0105]; figures 5a-6c ----- -/--	1-13

Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search  22 May 2012	Date of mailing of the international search report  31/05/2012
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/DK2012/050080

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99/42155 A2 (TYCO INTERNATIONAL US INC [US]) 26 August 1999 (1999-08-26) figures 9, 10 page 8, line 25 - line 34 -----	1-13
A	WO 2005/092418 A1 (SAUER MANFRED [DE]) 6 October 2005 (2005-10-06) figures 1, 2 page 7 - page 9 -----	1-13

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/DK2012/050080

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202005009947 U1	15-09-2005	NONE	
-----			
US 5765682 A	16-06-1998	NONE	
-----			
US 2003060807 A1	27-03-2003	US 2003060807 A1	27-03-2003
		US 2008319423 A1	25-12-2008
		US 2011147238 A1	23-06-2011
-----			
WO 9942155 A2	26-08-1999	AT 306292 T	15-10-2005
		AU 3306299 A	06-09-1999
		CA 2287187 A1	26-08-1999
		DE 69927646 T2	06-07-2006
		DK 0977610 T3	28-11-2005
		EP 0977610 A2	09-02-2000
		ES 2251208 T3	16-04-2006
		HK 1025747 A1	10-03-2006
		JP 2001517136 A	02-10-2001
		US 6053905 A	25-04-2000
		WO 9942155 A2	26-08-1999
-----			
WO 2005092418 A1	06-10-2005	DE 102004013711 A1	20-10-2005
		WO 2005092418 A1	06-10-2005
-----			