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(54) **Title**: FILTER WITH AN EXTENSION ELEMENT

(57) **Abstract**: An ostomy bag with a filter construction is provided. The filter construction includes a deodorising element and an extension element. The extension element may function to provide buoyancy means so that a gas-inlet portion at the extension element is kept on top of the output or pushed away by the output. The extension element may also be attached to the ostomy bag at a distance from the deodorising element so as to provide a controlled flow path for the gas-flow.

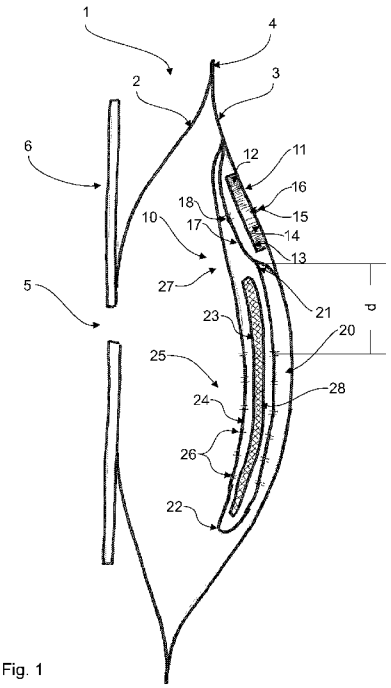


Fig. 1

WO 2011/150937 A1

Filter with an extension element

The invention relates to a filter for use in an ostomy bag. The filter has an extension element so that the inlet is placed a distance from the deodorising element.

Background

In connection with surgery for a number of diseases in the gastro-intestinal tract, one of the consequences in many cases is that the patient is left with an abdominal stoma such as a colostomy, an ileostomy or a urostomy in the abdominal wall for the discharge of visceral contents. The discharge of visceral contents including intestinal gases cannot be regulated at will. For that purpose, the user will have to rely on an appliance to collect the material emerging from such opening in a bag, which is later emptied and/or discarded at a suitable time.

The discharge of flatus, measured in volume, may exceed the discharge of solid and liquid faecal matter by many hundreds of percent and therefore there is usually the need for the continuous or frequent venting of the intestine or the collecting bag. Normally the out-flowing flatus is deodorised with a suitable filter. Commonly, the active filter is powdered active carbon, which absorbs H_2S being the principal component of the smell of flatus.

During use of a collecting bag, the output from a colostomy or an ileostomy may stick on the face of the filter facing inwards in the collecting bag. This will eventually lead to clogging of the filter thereby reducing the flow through the filter. When the filter is completely blocked, it will stop functioning and the bag will fill with gases and expand, an effect also known as ballooning. This may cause embarrassment for the user because the bag will be noticeable under the clothing. It may also lead to the bag being detached from the wafer, in case a two-piece appliance is used, or being detached from the skin, in case a one-piece appliance is used.

Description of related art

International application no. WO2006/048019 relates to an in situ cleanable filter for an ostomy appliance comprising a pathway for leading gases to a vent in an ostomy bag and a protective element contained in said pathway to prevent solid or semi-liquid waste from blocking the pathway. The protective element is made of an open celled compressible material having a memory and having a pore size of at least 60 PPI.

European Patent no. EP0607028B relates to an ostomy bag including a multi-stage filter system that provides contamination protection for a deodorizing filter in the system. The multi-stage filter system also includes a gas transmissible protection filter that is impassable to semi-liquid waste material. The protection filter is located in the ostomy bag to precede the deodorizing filter such that gaseous waste must pass through the protection filter before it passes through the deodorizing filter.

German utility model no. DE20021420U relates to an ostomy bag with an inlet, a gas discharge opening where the gas discharge opening is placed upstream of the filter. The filter consists of a rod-shaped hollow body filled with a filtering medium.

Summary of the Invention

The invention relates to an ostomy bag with a filter construction. The ostomy bag has a front wall and a rear wall. The filter construction has a deodorising element and an extension element. The extension element has a gas-inlet portion which is provided with numerous gas-inlets placed across an outer surface of the extension element. Thereby it is ensured that at least one of the gas-inlets is always out of contact with the output.

Detailed Description of the Invention

In a first aspect, the invention relates to an ostomy bag comprising

- a pouch including a front wall and a rear wall
- a waste inlet opening in the rear wall for letting the output from the stoma enter into the pouch,
- a vent opening in either the front wall or the rear wall for letting gas exit the bag,
- a filter construction with a gas-outlet in alignment with the vent opening,
- the filter construction including a deodorising element and an elongated extension element providing an enclosure for gas-flow,
- the deodorising element being provided with the gas outlet,
- the deodorising element being connected to a first end of the elongated extension element, the extension element being provided with a second end so that the direction from the first end to the second end defines the longitudinal direction of the extension element,
- the extension element having a gas-inlet portion including a number of gas-inlets to the filter construction,

- the gas-inlets being placed across an outer surface of the extension element in the transverse direction so that the gas-inlets generally face in the opposite directions from the outer surface.

The extension element in the filter construction provides gas-inlets away from the deodorising element. Thus there is a distance between the closest gas-inlet and the deodorising element. Therefore, the extension element may function as a kind of pre-filter, making the liquid and semi-solid matter travel a longer distance before potentially reaching the deodorising element.

An ostomy bag is well-known in the art. It usually comprises a front wall and a rear wall of gas- and liquid impermeable foil-material (for example of polyethylene (PE), polyvinyl-chloride (PVC) or ethylene-vinyl-acetate (EVA)) that is welded or glued around the edges or the rim so as to form a waste collection chamber. The bag may be welded or glued only partly around the rim so that an opening for emptying the bag is provided in the lower end. In that case the bag may be provided with means for closing that opening. The bag includes a waste inlet opening which at the outer side is provided either with mechanical or adhesive coupling means for coupling to a body side wafer or with a skin-friendly adhesive adapted for direct adhering to the abdomen of the user.

Usually, the waste inlet opening is placed in the upper part of the ostomy bag so that when a user stands up, the waste inlet opening will be above the midline of the ostomy bag. This leaves a larger collecting volume below the waste inlet opening. Thus the top of the ostomy bag is defined as the part closest to the waste inlet opening, and the bottom is defined as the opposite part.

The vent of the ostomy bag may be placed either in the contour or the rim of the bag – by leaving a small part of this un-welded, or it may be placed as a separate hole in the front or rear wall of the bag.

The extension element is attached to the deodorising element. It provides an enclosure for the gas-flow which may be in the form of a tube element so as to allow for gas-flow through the tube from the gas-inlet portion including the gas-inlets to the deodorising element. It is an elongated element having a first end connected to the deodorising element and a second end opposite in the longitudinal direction. The gas-inlets being placed facing in opposite directions has the effect that no matter how the extension element is positioned, at least one of the gas-inlets is always accessible for entry of gas.

In an embodiment of the invention, the extension element includes buoyancy means. In this embodiment, the extension element is only attached to any part of the ostomy bag in the first end, where it is attached to the deodorising element. Therefore, the remaining part of the extension element may float around freely in the bag. Because the extension element is made of material having a lower density than the output, the extension element will float atop the output. The theory is that with output from an ileostomy (which usually is rather thin, having a syrupy consistency) at least a part of the extension element will float "on top" of the output. With output from a colostomy (which usually is thicker, like porridge) the element will simply be pushed away. The extension element will thus never be covered completely by output and at least part of the gas-inlet portion is not covered in output for example the part facing upwards from the output, if the extension element floats atop the output. Therefore, at least some of the gas-inlets will never be completely covered and prevent the filter construction from being completely clogged and thus allow gas flow.

The extension element may include buoyancy means in form of a foil-element or an element made of non-woven material. The foil-material may be the type of foil-material regularly used for filters for ostomy bags, for example styrene-ethylene-butadiene-styrene (SEBS) and a mixture of poly-ethylene (PE) and ethylene-vinyl-acetate (EVA). Non-woven materials may be of the type regularly used for covering the surface of the ostomy bag on the outside, for example poly-ethylene (PE), poly-propylene (PP) or Polyester. All of these types of material are cheap and cooperate well with the other materials in an ostomy bag.

The extension element may be made by two elongate foil-elements welded together at their sides (and at the second end) so as to provide an enclosure between them. It may also be made by one foil-element folded upon itself and welded at the side and at the second end so as to provide an enclosure. It may be folded to provide an edge or folded to provide a tube-element.

In the above-mentioned embodiments, air enclosed in the foil-element may function as buoyancy means.

In an embodiment, foam material may be enclosed in the foil-element or the non-woven element. Thereby the foil-element or non-woven element is prevented from collapsing completely if it is bent due to the user's body movement. Thus, there will always be pathway through the extension element for the gas flow towards the deodorising element.

The foam may function as a further pre-filtering mechanism as it is able to capture liquid and semi-solid material entering into the extension element.

In another embodiment, the extension element may be in form of a tube-element made of a rather rigid material, for example PE. The tube-element will not be likely to collapse during use. The tube-element may be provided with corrugations so as to enhance the comfort for the user and to prevent the tube from penetrating through the ostomy bag.

One of the decisive factors for the buoyancy is the density of the extension element when compared to the density of the output in which the extension element is to be present. To keep the extension element afloat it must be made of a material with a density lower than the density of the output.

The density of most plastics is below 1000 kg/m^3. As an example the density of SEBS-foil is approximately 900 kg/m^3. The plastics may in use enclose air, thus lowering the density of the extension element.

The density of the foam material may be as low as 20 kg/m^3.

In another embodiment, the buoyancy means is a buoyant element that is attached at the second end. This buoyant element may include a foam element enclosed in foil material. In this embodiment, the extension element itself may be made of any material, because the buoyancy will be provided by a separate element. The buoyant element has to be able to provide enough buoyant force to keep the gas-inlet portion of the extension element afloat. The buoyancy force required depends on how much the bag is tilted around and squeezed during wear. It is contemplated that a buoyancy force of about 0.01N will be enough in most situations. Tests have shown that a foam material of polyurethane (PU) with 45 PPI will provide enough buoyancy force if the foam is larger than 5 mm x 10 mm x 10 mm. PPI is a unit giving a measure for the pore size although it actually refers to number of pores per inch in the foam material.

The length of the extension element influences how the element can be pushed away by or is able to float atop the output. The distance between the first end of the extension element and the end of the gas-inlet portion closest to the first end has to be so long that the gas-inlets can be kept open, even if the output gets very close to the deodorising element. Thus, there is a non-permeable portion of the surface of the extension element without gas-inlets. Tests have shown that if this distance is at least 3 cm, then the inlets

will be kept open. That the surface is non-permeable means that it is gas- and liquid impermeable in the conditions normally occurring in an ostomy bag.

In another embodiment, the second end of the extension element is attached to the ostomy bag at a distance from the deodorising element. Attaching the extension element at a certain distance from the deodorising element allows a controlled distance between the gas-inlet portion of the extension and the deodorising element and thus a controlled distance between the gas-inlets and the deodorising element.

Sometimes output from a colostomy has such a consistency that it does not readily fall towards the bottom of the pouch but rather stays in the upper volume of the pouch near the waste inlet opening. For such situations, it may be an advantage if the gas-inlet to the filter construction is placed in the lower half of the pouch. This is possible with an extension element, where the second end is attached in the lower half of the pouch, below the midline – that is the part of the pouch lying below the waste inlet opening in the normal use situation.

For one-piece ostomy bags – that is ostomy bags provided with a skin friendly adhesive around the waste inlet opening for attaching the bag to the abdomen of the user – the user typically adapts the wafer to the size and shape of the stoma. For such use it is an advantage if the second end of the extension element is attached so that the extension element is positioned distant from the waste inlet opening in a plane transverse to the walls of the ostomy bag. In other words, the entire filter construction may be positioned away from the volume of the bag immediately surrounding the waste inlet opening. This way the risk of cutting into the filter construction when cutting the wafer is minimised. The extension element may be kept within 2-5 cm from the rim of the pouch. The filter construction may have a rather sharp edge in some embodiments, for example where two foils are welded together to form the extension element. It may be an advantage if this edge is kept at least a few millimetres radially beyond the maximum cutting diameter of the waste inlet opening. This is to minimise the risk of the sharp edge irritation the stoma if the stoma were to enter into the ostomy bag.

Filters for ostomy bags contain an element providing the deodorising effect of the gas passing through the filter. This is the so-called deodorising element. Typically this element is a foam-element that is impregnated with carbon. The deodorising element is usually enclosed in foil-material and provided with at least one inlet and at least one outlet. The deodorising element enclosed in foil and provided with an inlet and outlet constitutes the

actual deodorising filter. An example of such a deodorising filter is described in European Patent no. EP0981311 B1. Another example is a deodorising filter sold under the trademark "Filtrodor"®. The outlet of the deodorising filter will be a gas outlet which is in communication with the ambience outside the bag through the vent opening.

Brief Description of the Drawing

Figure 1 illustrates an ostomy bag according to the invention.

Figure 2 illustrates an extension element that may be used in an ostomy bag according to the invention.

Figure 3 illustrates a separate buoyant element.

Figure 4 illustrates an exploded view of an extension element.

Figures 5 and 6 illustrate tube-like filter constructions.

Detailed Description of the Drawing

Figure 1 illustrates an ostomy bag **1** according to the invention. The ostomy bag comprises a rear wall **2** and a front wall **3**, that are welded together along their rim **4**. The rear wall **2** has a waste inlet opening **5**, which in this embodiment is surrounded by a skin-friendly adhesive **6**. The filter construction **10** in the ostomy bag comprises a deodorising element **11** and an elongate extension element **20**. The deodorising element **11** is disc-shaped and comprises foam impregnated with carbon **12** covered by two gas-impermeable foils **13**, **14**. The foil **14** facing the front wall **3** is provided with a gas outlet **15** placed in alignment with the vent **16** in the front wall. The deodorising element **11** including the cover-foils **13**, **14** is further enclosed in an enclosure foil **17** provided with an inlet **18** to the deodorising element. Thus, gas coming from the extension element enters through the inlet **18** in the enclosure foil **17** and from there around the deodorising element **11** to enter into the carbon-impregnated foam **12** at the periphery, radially through the element **11** towards the centre and exits through the gas-outlet **15** and the vent **16**.

The extension element **20** comprises a first end **21** and a second end **22** and an enclosure **23** in between. In this embodiment, the enclosure **23** is provided by a foil layer **24** that is welded at a side (not shown) and at the second end **22**. The foil layer **24** is perforated over a part of the surface so that the extension element **20** is divided into a

gas-inlet portion **25** with gas-inlets **26** and a non-permeable portion **27** without gas-inlets. Thus, there is a distance d between the gas-inlet closest to the deodorising element and the first end of the extension element. In this embodiment, the enclosure **23** further includes a foam-element **28**, which may function as a further stopper for liquid entering into the extension element and as an element preventing kinking of the extension element.

Figure 2 illustrates another filter construction **110** for use in an ostomy bag according to the invention. The filter construction **110** includes a deodorising element **111** and an elongated tube-like extension element **120**. The deodorising element **111** includes a gas-outlet **115**, which in use is positioned in an aligned position with the vent of the ostomy bag (not shown). In this embodiment, the deodorising element **111** further includes an inlet **118**. The extension element **120** is connected to the deodorising element **111** at a first end **121** and stretches in a generally longitudinal direction towards a second end **122**. In the embodiment shown, the extension element **120** includes foam **128** enclosed inside the enclosure **123** of the extension element. At the second end **122** a buoyant element **130** is attached to the extension element **120**. Like with the embodiment in figure 1, the extension element **120** has perforations providing gas-inlets **126** at a gas-inlet portion **125**. Again, there is a non-permeable portion **127** closest to the deodorising element **111**.

Figure 3 illustrates a buoyant element **130**. This buoyant element **130** consists of two foil layers **131**, **132** that are welded together to form a chamber **133** for a piece of foam **134**.

Figure 4 illustrates how a filter construction **210** can be positioned in alignment with the vent **216** in a wall **203** of an ostomy bag. The deodorising element **211** is, in this embodiment, circular – therefore the connection at the first end **221** between the extension element **220** and the deodorising element **211** is made circular. Furthermore, in this embodiment the extension element **220** consists of two layers of foil **224a** and **224b** that are welded along their sides to form an enclosure **223** for the foam **228**. The two layers of foil **224a**, **224b** are perforated to provide gas-inlets **226** in the gas-inlet portion **225**. The non-permeable portion **227** also appears from the figure.

Figures 5 and 6 illustrate two examples of tube like filter constructions. In figure 5, the filter construction **310** comprises a net-foil **324** in the extension element **320** and in figure 6, the filter construction **410** comprises a perforated foil **424** in the extension element **420**. Thus the gas-inlets **426** appear clearly in figure 6, while they cannot be seen in figure 5 because they are too small. The deodorising element **311**, **411** comprises a carbon-

impregnated tubular foam element **312**, **412**. The extension element **320**, **420** comprises a foam element **328**, **428**. In the filter construction **310** in figure 5, the foil **313** at the deodorising element **311** is a gas- and liquid impermeable foil, which is welded to the net-foil **324**. Alternatively, the net-foil can extend all the way at the deodorising element and be provided with an extra impermeable foil layer. The filter construction **310** is made by enclosing the foam elements **312** and **328** in the foils **324, 313** and then welding the combined foils **324**, **313** in the length direction. Following this, the foils are closed at the second end **322** of the extension element. The opposite end of the filter construction is left open to provide for the gas-outlet **315**.

In the filter construction **410**, the foil **424** may extend past the deodorising element **411**. It is only perforated at the gas-inlet portion **425** of the extension element. The foil **424** may be welded along the length to enclose both foam element **412** and **428**. Finally, it may be welded at the second end **422** of the extension element. The gas-outlet **415** is provided in the opposite end of the filter construction.

Claims

1. An ostomy bag comprising
   - a pouch including a front wall and a rear wall,
   - a waste inlet opening in the rear wall for letting the output from the stoma enter into the pouch,
   - a vent opening for letting gas exit the bag,
   - the filter construction including a deodorising element and an elongated extension element providing an enclosure for gas-flow,
   - the deodorising element being provided with the gas outlet,
   - the deodorising element being connected to a first end of the elongated extension element, the extension element being provided with a second end so that the direction from the first end to the second end defines the longitudinal direction of the extension element,
   - the extension element having a gas-inlet portion including a number of gas-inlets to the filter construction,
   - the gas-inlets being placed across an outer surface of the extension element in the transverse direction so that the gas-inlets generally face in the opposite direction from the outer surface.

2. The ostomy bag according to claim 1, wherein the extension element includes buoyancy means.

3. The ostomy bag according to claim 2, wherein the buoyancy means is in the form of a foil-element or an element made of non-woven material.

4. The ostomy bag according to claim 3, wherein foam material is enclosed in the foil-element or the non-woven element.

5. The ostomy bag according to claim 2, wherein the buoyancy means is in the form of a tube-element.

6. The ostomy bag according to claim 2, wherein a separate buoyant element is attached to the extension element at the second end.

7. The ostomy bag according to claim 1, wherein the second end of the extension element is attached to the ostomy bag at a distance d from the deodorising element.

8. The ostomy bag according to claim 7, wherein the second end is attached below a midline of the ostomy bag.

9. The ostomy bag according to claim 1, wherein a rim of the filter construction is attached in the contour of the ostomy bag

10. The ostomy bag according to claim 7, wherein the second end of the extension element is attached so that the extension element is positioned away from the waste inlet opening in a plane transverse to the walls of the ostomy bag.

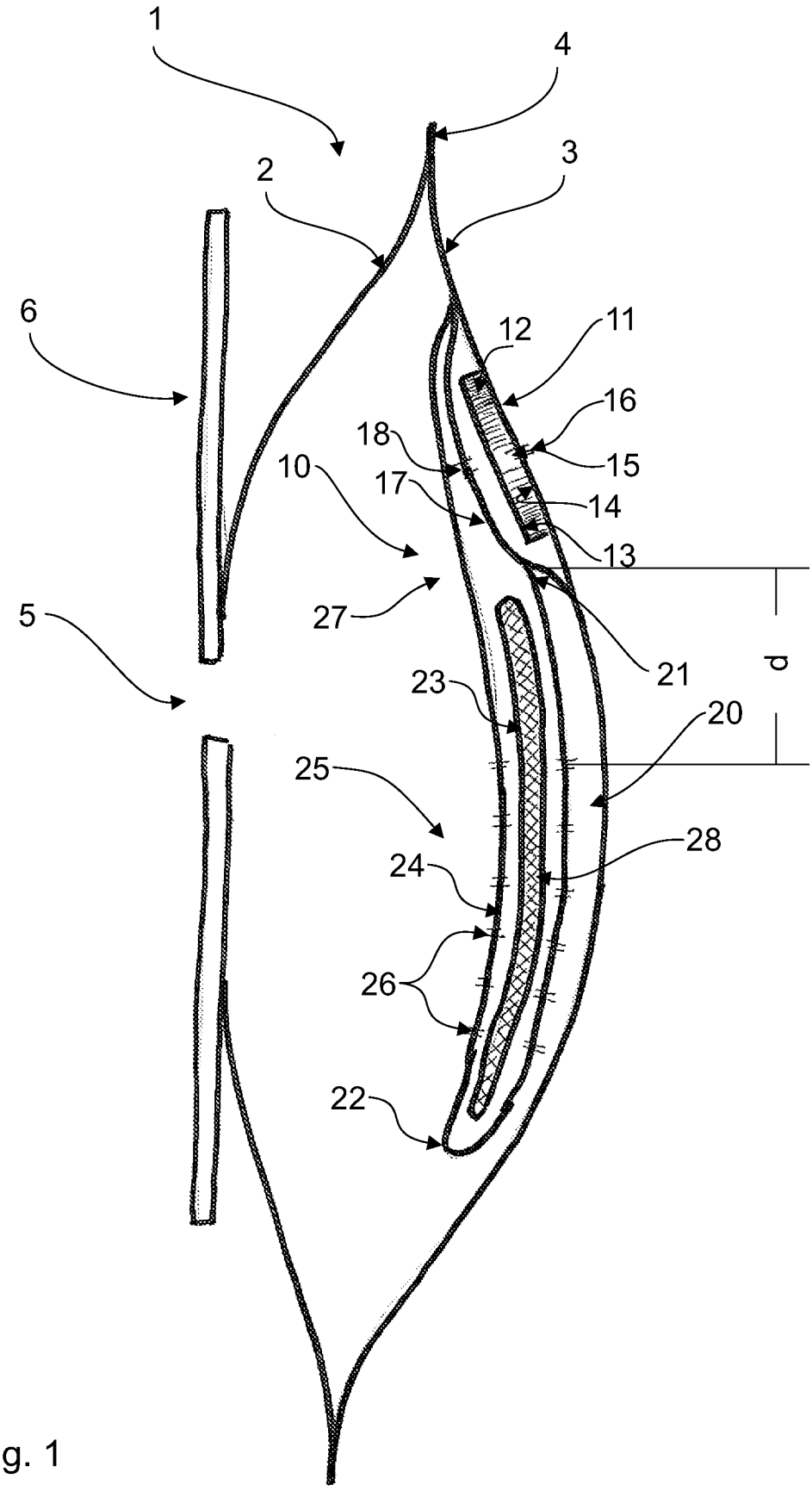


Fig. 1

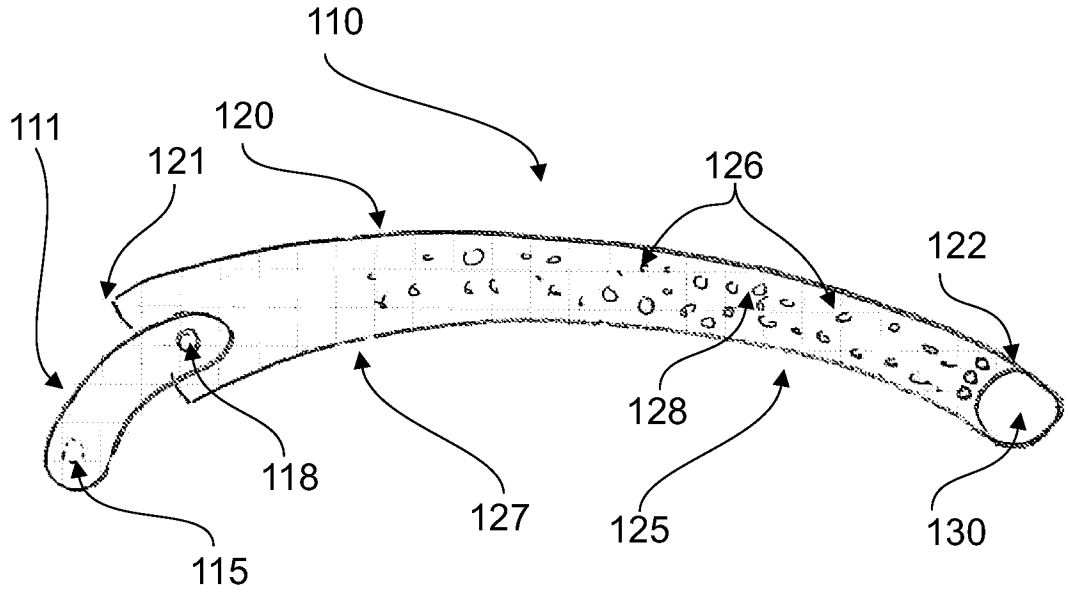

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Fig. 2

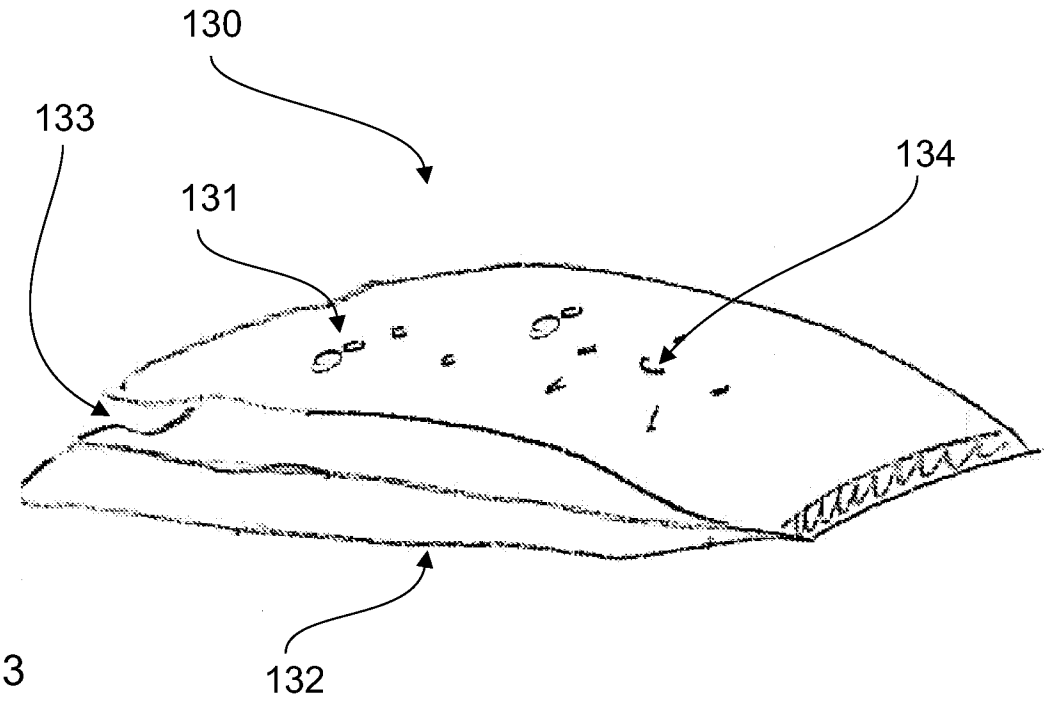

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Fig. 3

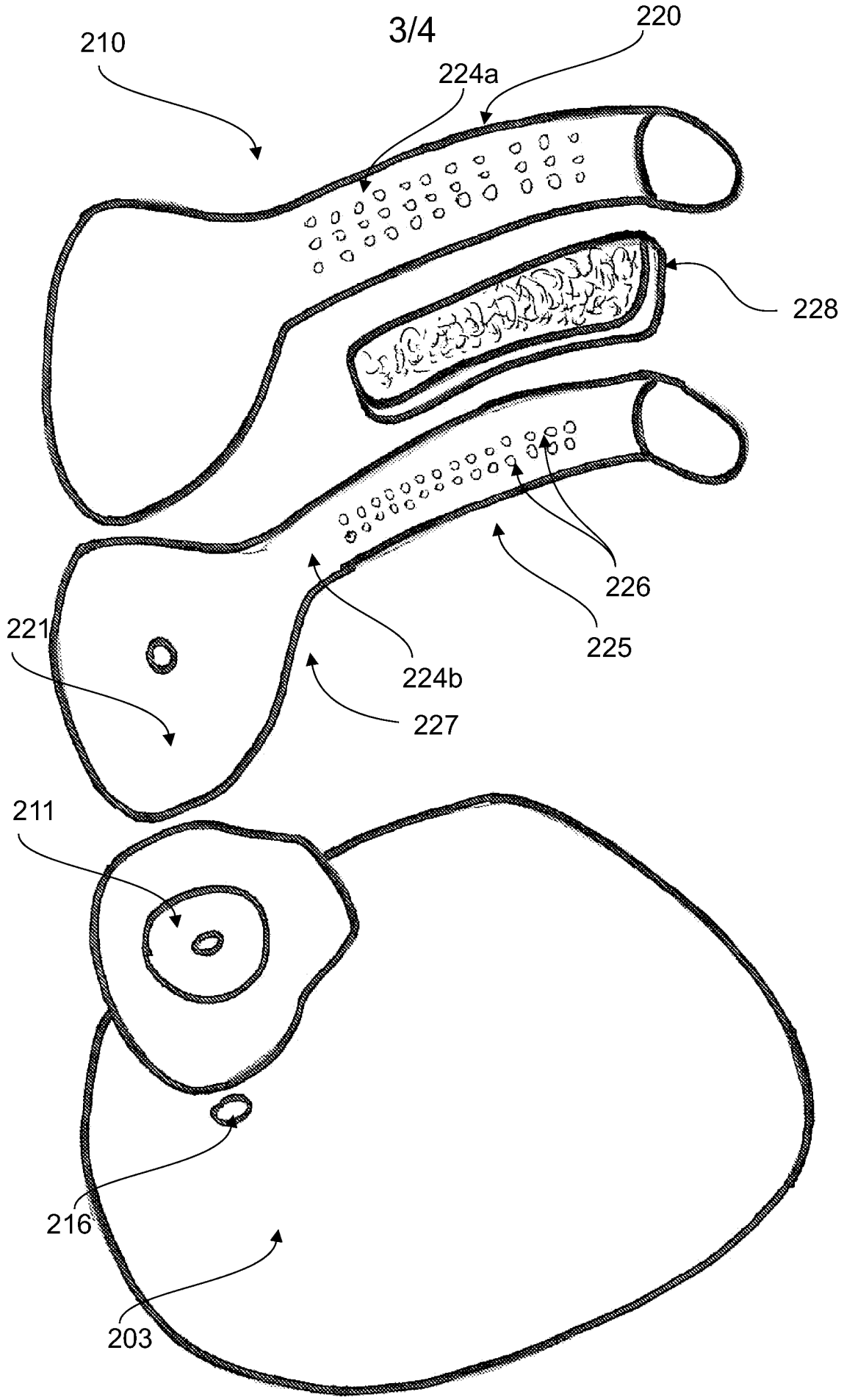


Fig. 4

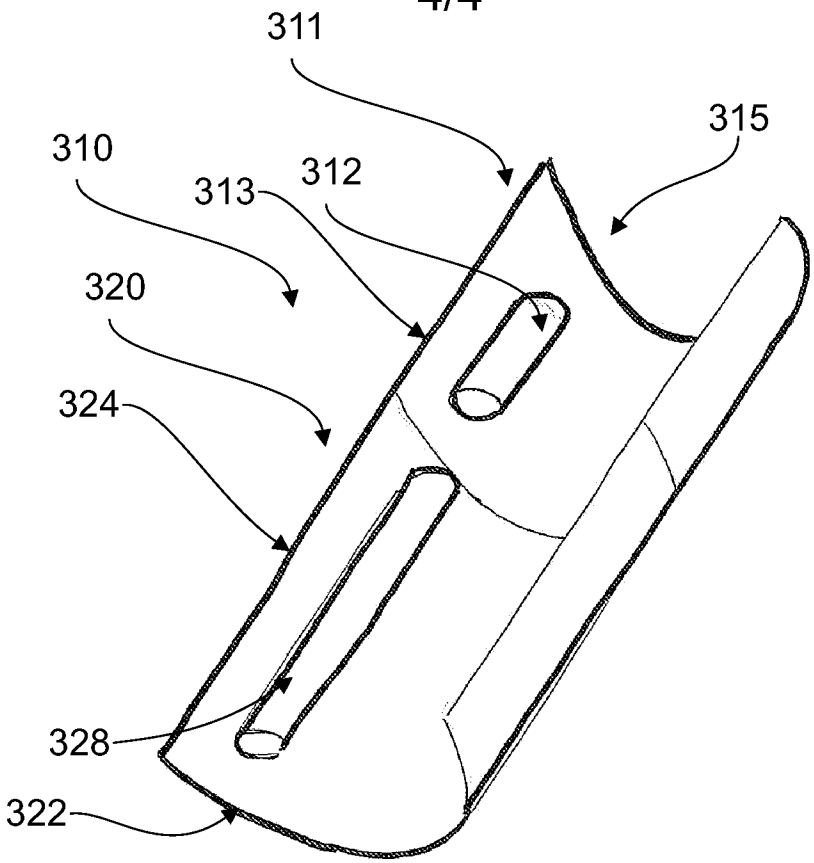

311
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Fig. 5

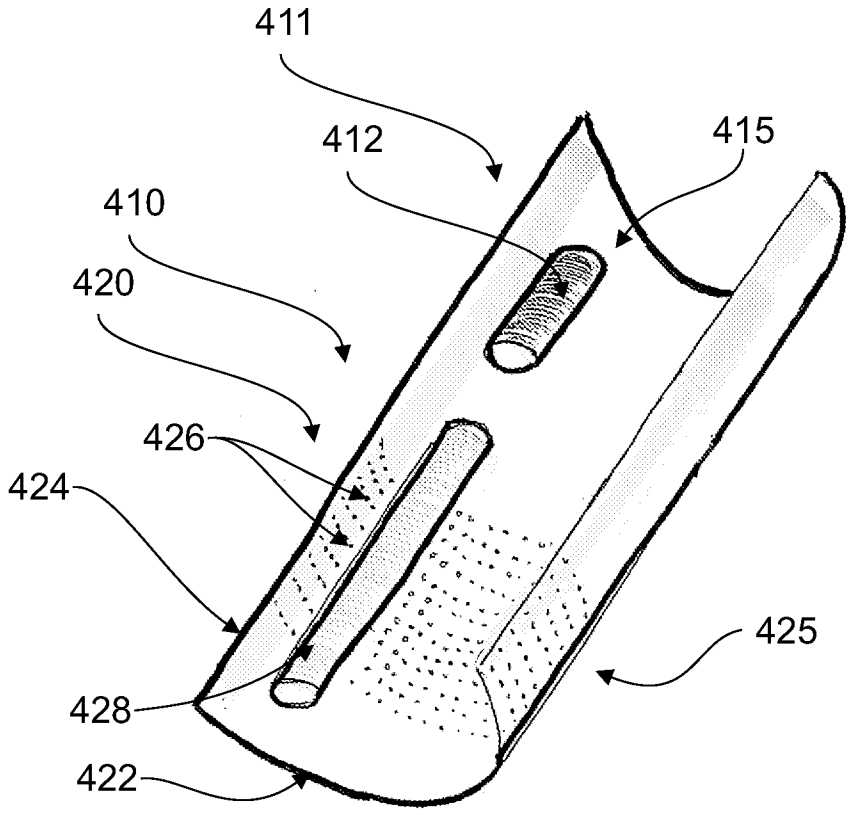

411
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422

Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2011/050190

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61F5/441
ADD.

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)
A61F

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/020188 A1 (COLOPLAST AS [DK]; BUELOW MARTIN VON [DK]; KRISTENSEN MOGENS GULDAGER) 13 March 2003 (2003-03-13)	1,9
A	abstract; figures page 1, lines 5-6 page 5, lines 2-21 page 6, lines 3-30 page 7, lines 18-26 page 9, lines 1-27 page 10, lines 6-14 page 14, line 8 - page 16, line 14	2-8,10
A	EP 0 443 728 A2 (SQUIBB & SONS INC [US]) 28 August 1991 (1991-08-28) abstract; figures column 3, line 39 - column 5, line 11	1-10

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
13 July 2011	25/07/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Lager, Johan

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2011/050190

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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