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(54) **Title:** MEDICAL DEVICE PRODUCTS INCLUDING LIQUID-DRAWING MEMBERS

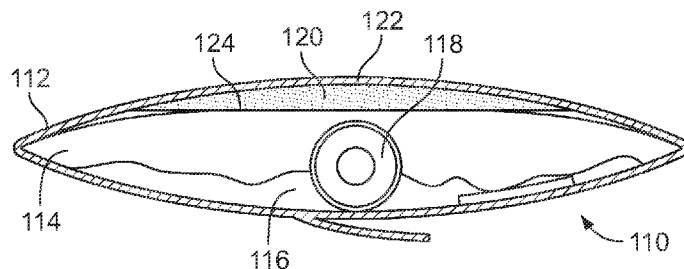


FIG. 4

(57) **Abstract:** A medical device product (10) comprises a package (12) defining an interior cavity (14), an activating liquid located within the interior cavity of the package, and a medical device (18) located within the interior cavity of the package. At least one portion of the medical device is activated by absorbing an amount of the activating liquid. A liquid-drawing member (20) is located within the interior cavity of the package. The liquid-drawing member absorbs any excess activating liquid within the cavity that was not absorbed by the at least one portion of the medical device.



## MEDICAL DEVICE PRODUCTS INCLUDING LIQUID-DRAWING MEMBERS

The present application claims the benefit of and priority to U.S. Provisional Application No. 63/018,730, filed May 1, 2020, which is hereby incorporated by  
5 reference.

### Background

#### Field of the Disclosure

[0001] The present disclosure generally relates to medical device products.  
More particularly, the present disclosure relates to medical device products  
10 including liquid drawing members.

#### Description of Related Art

[0002] Certain medical device products depend on liquid activation. One such  
medical device is a hydrophilic intermittent urinary catheter, in which the  
hydrophilic coating may be activated by direct contact of a liquid activation  
15 medium (e.g., liquid water) with the hydrophilic coating. Some of these medical  
device products achieve direct liquid contact by providing a package which  
contains the device and liquid, wherein the device is in direct contact with the  
liquid. In several of these products the liquid flows freely within the cavity of the  
package and has unobstructed access to the medical device. Because of the free  
20 flow of loose liquid within the package and unobstructed access to the device  
surface, it is easy to provide direct contact of the liquid medium with the device  
within the package.

[0003] One of the challenges of the medical device products described above  
is that the liquid can tend to spill from the package as the user handles the  
25 product and removes the device from the package for use. Accordingly, there is a  
need for products and packages that reduce the risk of liquid spillage from the  
package.

#### Summary

[0004] There are several aspects of the present subject matter which may be  
30 embodied separately or together in the devices and systems described and  
claimed below. These aspects may be employed alone or in combination with  
other aspects of the subject matter described herein, and the description of these  
aspects together is not intended to preclude the use of these aspects separately

or the claiming of such aspects separately or in different combinations as set forth in the claims appended hereto.

[0005] In one aspect, a medical device product includes a package defining an interior cavity, an activating liquid located within the interior cavity of the package, and a medical device located within the interior cavity of the package. At least one portion of the medical device is activated by absorbing an amount of the activating liquid. Additionally, a liquid-drawing member is located within the interior cavity of the package. The liquid-drawing member absorbs any excess activating liquid within the cavity that was not absorbed by the at least one portion of the medical device.

[0006] In another aspect, a urinary catheter product includes a package defining an interior cavity, an activating liquid located within the interior cavity of the package, and a urinary catheter located within the interior cavity of the package. At least one portion of the catheter comprises a lubricious hydrophilic material that is activated by absorbing an amount of the activating liquid. Furthermore, a liquid-drawing member is located within the interior cavity of the package. The liquid-drawing member absorbs any excess activating liquid within the cavity that was not absorbed by the at least one portion of the catheter.

#### Brief Description of the Drawings

[0007] Fig. 1 is a top view of an embodiment of a package for a medical device product, according to an aspect of the present disclosure;

[0008] Fig. 2 is a cross-sectional view of the package of Fig. 1;

[0009] Fig. 3 is a top view of an embodiment of a package for a medical device product, according to an aspect of the present disclosure;

[00010] Fig. 4 is a cross-sectional view of the package of Fig. 3.

#### Description of the Illustrated Embodiments

[00011] The embodiments disclosed herein are for the purpose of providing a description of the present subject matter, and it is understood that the subject matter may be embodied in various other forms and combinations not shown in detail. Therefore, specific embodiments and features disclosed herein are not to be interpreted as limiting the subject matter as defined in the accompanying claims.

[00012] Figs. 1 and 2 illustrate an embodiment of a medical device product. The medical device product may be any product that requires liquid for

activation and/or assists in storing or preserving the product. The medical device product 10 comprises a package 12 defining an interior cavity 14. An activating liquid 16 and a medical device 18 are located within the interior cavity 14 of the package 12. The medical device may be any medical device that is packaged with a liquid. For example, the medical device 18 may be a hydrophilic urinary catheter. The activating liquid 16 may be any liquid that activates, preserves, or conditions the medical device 18 for use. In one embodiment, the activation liquid may be a hydration medium. The hydration medium may include water or saline.

5 [00013] At least one portion 18a of the medical device is activated by contact with the liquid 16. For example, the portion 18a may be activated by absorbing an amount of the activating liquid 16. When the medical device is a hydrophilic catheter, the activating liquid may hydrate/activate the hydrophilic coating of the catheter, making it more lubricious and easier to insert into a user's body.

10 [00014] The medical device product also includes a liquid-drawing member 20 that is located within the interior cavity 14 of the package 12. The liquid-drawing member 20 absorbs any excess activating liquid 16 within the cavity 14. Excess liquid is activating liquid 16 that was not absorbed by the at least one portion 18a of the medical device 18. The amount, or type, of the liquid-drawing member 20 within the package is tuned or enough to allow the at least one portion 20 18a of the medical device 18 to be activated by the activating liquid 16, while the liquid-drawing member 20 absorbs any excess liquid.

[00015] In one embodiment, the liquid-drawing member 20 may comprise a desiccant. The desiccant absorbs excess activating liquid 16 within the cavity 14 so that when the package 12 is opened, there is a reduced risk of the liquid 16 25 spilling out of the package 12. The liquid-drawing member 20 may include a hygroscopic agent. The hygroscopic agent may be a solid, liquid or gel. The hygroscopic agent may include at least one of a glycerol or a glycerol gel. The desiccant and the hygroscopic agent both promote drawing and absorption of excess activating liquid 16.

30 [00016] Figs. 3 and 4 illustrate an embodiment of a medical device product 110. The medical device product 110 is similar to that of Figs. 1 and 2 and includes a package 112 defining an interior cavity 114, an activating liquid 116 located within the interior cavity 114 of the package 112, and a medical device 118 located within the interior cavity 114 of the package 112. In an embodiment,

the medical device 118 may be a urinary catheter such that the medical device product 110 may be a urinary catheter product. At least one portion 118a of the medical device 118 is activated, preserved or conditioned by the liquid 116. A liquid-drawing member 120 is located within the interior cavity 114 of the package 5 112. The liquid-drawing member 120 absorbs any excess activating liquid 116 within the cavity 114. Excess liquid is activating liquid 116 that was not absorbed by the at least one portion 118a of the medical device 118.

**[00017]** In the embodiment shown in Figs. 3 and 4, the liquid-drawing member 120 is located within a compartment 122 within the interior cavity 114. 10 The compartment 122 may be at least partially defined by a liquid permeable barrier 124 (shown in Fig. 4). In the illustrated embodiment, the compartment 122 is defined by the liquid permeable barrier 124 and the sidewall of the package 112. The barrier 124 is made of a material that allows the activating liquid 116 to pass through the barrier 124. The barrier 124 may be a liquid and gas permeable 15 membrane. The drawing member 120 draws any excess activating liquid 116 through the barrier 124 causing the excess liquid 116 to flow from the cavity 114 into the compartment 122. By drawing the excess liquid 116 out of the cavity 114, the drawing member 120 prevents spillage, while still allowing the medical device 118 to be activated and/or hydrated by the activating liquid 116. Though the 20 product described above includes embodiments with one cavity and/or one compartment, any appropriate number of cavities and/or compartments may be used. Additionally, in alternative embodiments, the product may be configured to contain a plurality of medical devices, a plurality of liquid draw members, and/or a plurality of activating liquids.

25 **[00018]** Other variations and combinations may also be employed without departing from the scope of the present disclosure.

**[00019]** It will be understood that the embodiments described above are illustrative of some of the applications of the principles of the present subject matter. Numerous modifications may be made by those skilled in the art without 30 departing from the spirit and scope of the claimed subject matter, including those combinations of features that are individually disclosed or claimed herein. For these reasons, the scope hereof is not limited to the above description but is as set forth in the following claims, and it is understood that claims may be directed to the features hereof, including as combinations of features that are individually

disclosed or claimed herein.

CLAIMS

1. A medical device product, comprising:
  - a package defining an interior cavity;
  - an activating liquid located within the interior cavity of the package;
- 5 2. a medical device located within the interior cavity of the package, at least one portion of the medical device being activated, preserved or conditioned by an amount of the activating liquid; and
  - a liquid-drawing member located within the interior cavity of the package, the liquid-drawing member absorbing any excess activating liquid within the cavity
  - 10 that was not absorbed by the at least one portion of the medical device.
3. The product of claim 1, wherein the liquid-drawing member is located within a compartment within the interior cavity.
3. The product of any one of claims 1 and 2, wherein the compartment is at least partially defined by a liquid permeable barrier.
- 15 4. The product of any one of claims 1-3, wherein the activating liquid comprises a hydration medium.
5. The product of any one of claims 1-4, wherein the activating liquid comprises water.
6. The product of any one of claims 1-5, wherein the liquid-drawing member
- 20 comprises a desiccant.
7. The product of any one of claims 1-6, wherein the liquid-drawing member comprises a hygroscopic agent.
8. The product of claim 7, wherein the hygroscopic agent comprises at least one of a glycerol or a glycerol gel.
- 25 9. The product of any one of claims 1-8, wherein the medical device comprises a urinary catheter, wherein at least one portion of the catheter comprises a lubricious hydrophilic material that is activated by the activating liquid.
10. The product of claim 9, wherein the lubricious hydrophilic material comprises a hydrophilic polymer coating.
- 30 11. A urinary catheter product, comprising:
  - a package defining an interior cavity;
  - an activating liquid located within the interior cavity of the package;

a urinary catheter located within the interior cavity of the package, at least one portion of the catheter comprising a lubricious hydrophilic material that is activated by absorbing an amount of the activating liquid; and

5 a liquid-drawing member located within the interior cavity of the package, the liquid-drawing member absorbing any excess activating liquid within the cavity that was not absorbed by the at least one portion of the catheter.

12. The product of claim 11, wherein the liquid-drawing member is located within a compartment within the interior cavity.

10 13. The product of any one of claims 11 and 12, wherein the compartment is at least partially defined by a liquid permeable barrier.

14. The product of any one of claims 11-13, wherein the activating liquid comprises a hydration medium.

15. The product of any one of claims 11-14, wherein the activating liquid comprises water.

15 16. The product of any one of claims 11-15, wherein the liquid-drawing member comprises a desiccant.

17. The product of any one of claims 11-16, wherein the liquid-drawing member comprises a hygroscopic agent.

20 18. The product of claim 17, wherein the hygroscopic agent comprises at least one of a glycerol or a glycerol gel.

19. The product of claim 11, wherein the lubricious hydrophilic material comprises a hydrophilic polymer coating.



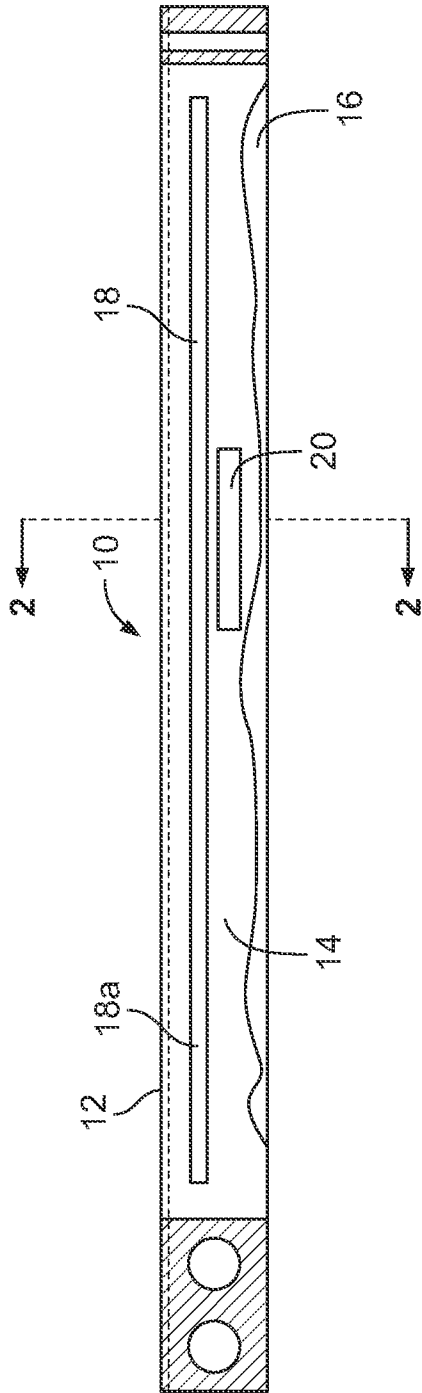


FIG. 1

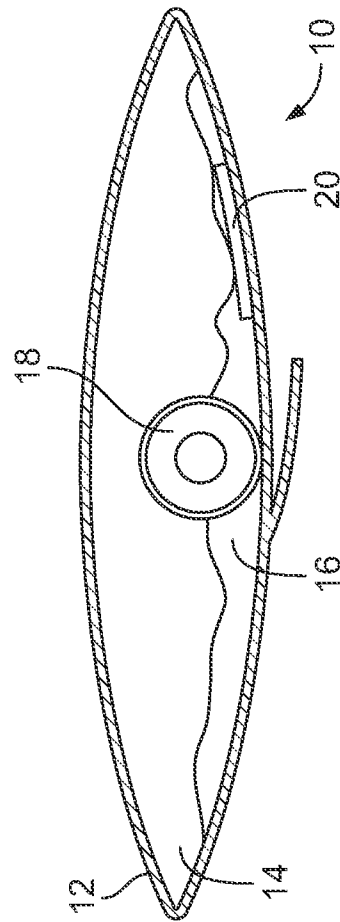


FIG. 2

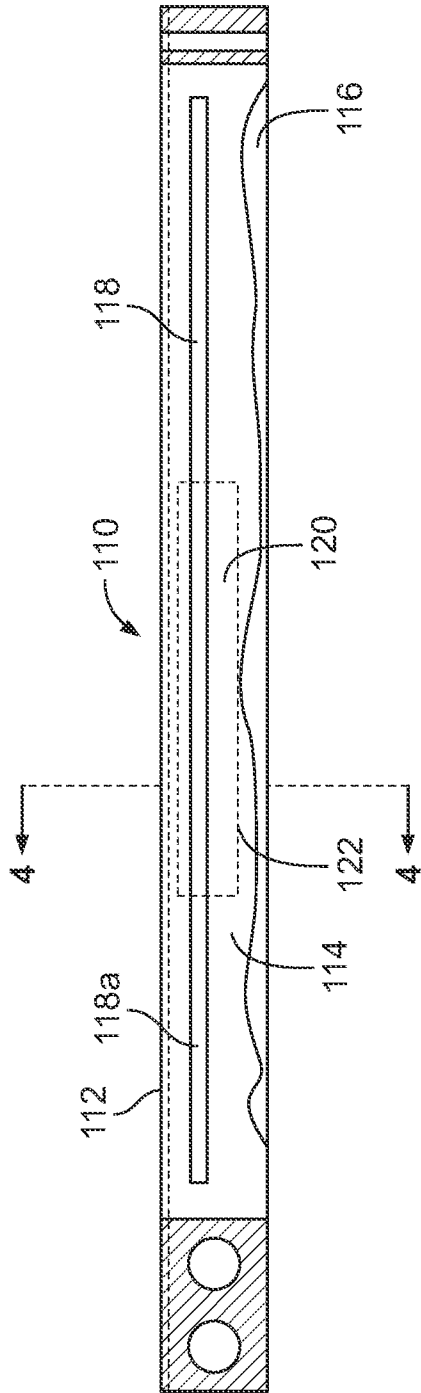


FIG. 3

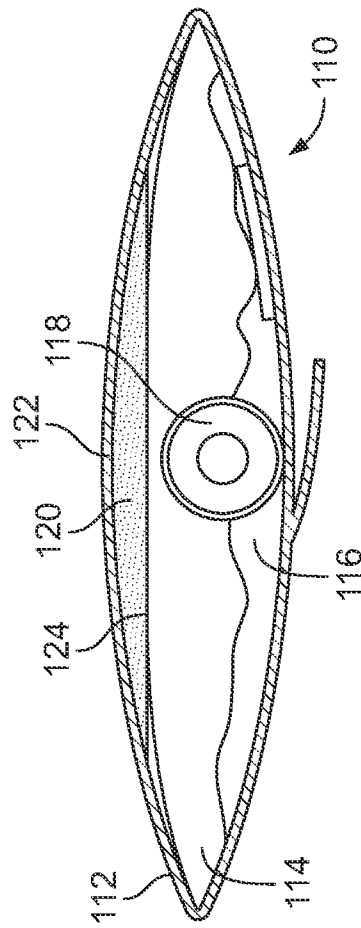


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2021/029992

A. CLASSIFICATION OF SUBJECT MATTER  
INV. A61M25/00  
ADD. A61M27/00

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

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

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X	EP 2 060 296 A1 (HOLLISTER INC [US]) 20 May 2009 (2009-05-20) column 1, line 5 - column 21, line 14; figures 1-14A	1-7, 10-17,19
X	JP 2000 281144 A (TERUMO CORP) 10 October 2000 (2000-10-10) page 1, paragraph 1 - page 15, paragraph 243; figures 1-8	1-19
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Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

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Date of the actual completion of the international search  7 September 2021	Date of mailing of the international search report  16/09/2021
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Rolland, Philippe
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2021/029992

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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