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(54) TUBE CLOSURE

(57) A poster tube closure 10 is disclosed comprising a plug member for locating within an end of a poster tube. The plug member comprises a substantially planar closure surface with upper and lower faces, wherein a perimeter wall 14 extends downwardly from the lower face for gripping the wall of a poster tube when inserted. The upper face has a frangible or weakened area 18 arranged in use to be broken by user action to permit removal of the plug member and a visible indication of said breakage.

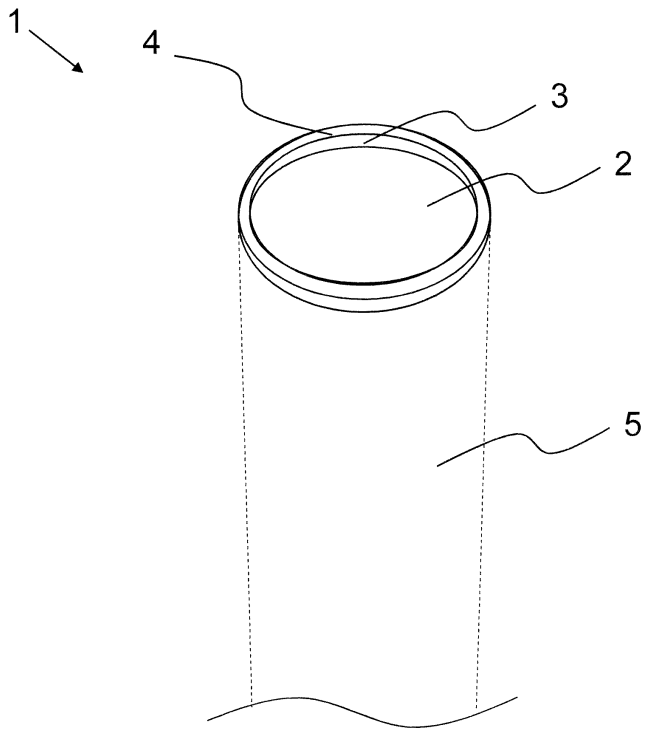

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a tube closure, for example a poster tube closure, and to a tube system.

BACKGROUND TO THE INVENTION

[0002] Poster tubes are rigid tubes, usually cylindrical, within which posters, artwork or photographs are stored in rolled-up form for protection during transportation, e. g. when posted from a supplier to a customer.

[0003] The tube is usually closed-off at each or one end by an end-plug or closure 1 of the form shown in Figure 1. Conventional closures are circular, push-fit plugs that are shaped to snugly locate within the end of the tube, comprising a solid planar base 2, with an upstanding perimeter wall 3 and a circumferential lip 4 inwards of the wall that allows the recipient to grip the closure to pull-it out of the tube to access the poster inside.

[0004] Where the contents are of value, or liable to be tampered with, the closures are usually secured using adhesive tape or staples. Tape looks unsightly and can easily be removed and replaced. Stapling is more secure, but requires an air stapler to puncture the tube, and presents a problem in that a tool is needed to remove the staples which, if not properly removed, may damage the poster as it is drawn out of the tube.

SUMMARY OF THE INVENTION

[0005] A first aspect of the invention provides a tube closure, comprising a plug member for locating substantially entirely within an open end of a tube, the plug member being provided with a breakable region configured in use to be broken by user action in order to enable access beneath to enable its extraction from a tube within which it is located.

[0006] The tube closure is particularly a poster tube closure, e.g. comprising a plug member for locating within an open end of a poster tube, the plug member being provided with a breakable region configured in use to be broken by user action in order to enable access beneath to enable its extraction from a tube within which it is located.

[0007] The closure therefore provides a neat and convenient way of closing a poster tube which provides a visible indication of tampering via the breakable region. It will be appreciated that the breakable region can be broken in part only to provide access and removal.

[0008] A poster tube in this context can also be used for carrying similar articles such as artwork and photographs.

[0009] The plug member may have an upper and lower surface, and wherein the upper surface is generally planar with no upstanding perimeter wall so that in use it fits flush with the end of a poster tube.

[0010] The breakable region may be formed within the perimeter.

[0011] The breakable region may be defined by a plurality of perforations.

[0012] The perforations may define a tab-like breakable region part of which is not breakable, for example with the perforations not entirely bounding the breakable region so that part remains intact whilst still enabling removal of the closure and a visible indication of the break.

[0013] A circumferential wall may be provided that extends downwards relative to the plug member's upper surface and is arranged in use to locate within a tube to provide a snug fit.

[0014] One or more ribs may be provided on the circumferential wall, i.e. its outer side, to ensure the snug fit.

[0015] The closure may be formed of polyethylene.

[0016] A second aspect provides a poster tube closure, comprising a plug member for locating within an end of a poster tube, the plug member comprising a substantially planar closure surface with upper and lower faces, wherein a perimeter wall extends downwardly from the lower face for gripping the wall of a poster tube when inserted, and wherein the upper face has a frangible or weakened area arranged in use to be broken by user action to permit removal of the plug member and a visible indication of said breakage.

[0017] A third aspect provides a poster storage system, comprised of a hollow tube with at least one open end, and a removable plug member shaped and dimensioned to close-off the open end in accordance with any preceding definition.

[0018] A fourth aspect provides a poster storage system, comprised of a hollow tube with at least one open end, and a removable plug member shaped and dimensioned to close-off the open end, wherein the plug member on its external side has no upstanding projection or lip so that it can fit flush within the tube's open end, and has a breakable region accessible from the external side which is configured to be broken by user action to enable extraction of the plug from the tube from underneath.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a perspective view of a known tube closure, which is useful for understanding the background of the invention;

Figures 2a - 2c are different views of a tube closure according to the invention;

Figure 3 is a side sectional view of the tube closure of Figure 2 when located within a poster tube;

Figure 4 is a top plan view of a further embodiment

tube closure according to the invention; and

Figure 5 is a top plan view of a still further embodiment tube closure according to the invention;

Figure 6 is a side view of a still further embodiment tube closure according to the invention; and

Figure 7 is a side view of the Figure 6 closure when located within a poster tube, shown in section.

DETAILED DESCRIPTION OF THE INVENTION

[0020] Embodiments described herein relate to a poster tube closure and poster tube system. In this regard, it is to be understood that the term 'poster tube' can also encompass tubes for storing flexible artwork and photographs that can be rolled for storage.

[0021] Referring to Figures 2(a)-(c), a first embodiment poster tube closure (hereafter "closure") 10 is shown in different views. The closure is formed of plastics material, e.g. polyethylene (high or low density) but could be formed of any other plastic, metal, rigid cardboard or similar material.

[0022] The closure 10 is a disk shaped member having a planar upper surface 12 and a lower surface (not visible). A side wall 14 extends downwards from the perimeter of the lower surface. Around the side wall 14 is or are formed one or more gripping ribs 16, which is or are projections which in use are configured to firmly grip the inner surface of a poster tube to retain the closure 10 in position. Each rib 16 in this case is circumferential, but can be broken into several individual projections. A variety of rib arrangements could be used.

[0023] The closure 10 is shaped and dimensioned to fit snugly within the open end of a poster tube, the or each rib 16 serving to maintain the tight fit. The product within the tube will therefore be well protected from the elements. The closure 10 in use locates entirely within the open end, or substantially so.

[0024] The fact that the upper surface 12 is planar and has no projecting parts itself ensures that, when positioned within the tube, e.g. by a sender, the closure 10 is flush with the tube's terminating end. This makes it very difficult for the closure 10 to be removed, e.g. inappropriately in transit, and the closure can be put in place by the sender without using tape, staples or other specialist apparatus.

[0025] To enable the end-user to remove the closure 10, a breakable region 18 is provided in the closure 10, as seen from the upper surface 12. The breakable region 18 is formed by a line or boundary of weakness in the form of perforations or a score line which may or may not extend all the way through the closure's material. In the case of Figure 2, the breakable region 18 is defined within a circular score line 19, which could alternatively be a perforation line, and enables the end-user to remove the closure 10 by using their finger or thumb to break part of the scored or perforated boundary, and then they pull the closure upwards from its lower surface.

[0026] Use of a score line instead of perforations is advantageous in terms of avoiding moisture entering the closed-off tube during storage or transit, which might damage its contents.

[0027] The breakable region 18 also serves as a visible indicator of tampering. The end user can see very clearly if the breakable region 18 is in any way damaged. The breakable region in some embodiments is within, and spaced from, the outer perimeter of the closure, without extending all the way to the outer wall. This makes it straightforward to manufacture, amongst other advantages. In some embodiments, there is no external projection from the closure (other than the downwardly extending peripheral wall) and in particular nothing projecting upwards or sidewards from the upper surface so that the closure can fit entirely within the open end of the tube with nothing projecting out of the tube when it is closed, which might otherwise get caught or tangled with other things when stored or during transportation.

[0028] In the case of the first embodiment, the shape of the closure 10 is circular. It can, however, be of any shape, e.g. square, rectangular, triangular and so on depending on the cross-sectional shape of the tube with which it will be used. Likewise, the shape of the breakable region 18 is in this case circular, but can be of any shape which is not dependent on the overall shape of the closure 10.

[0029] Figure 3 shows in cross-section the closure 10 when inserted within one-end of a tube 30. The flush arrangement is visible, as is the use of the ribs 16 to provide a tight fit. The closure 10 can be provided as a separate item for use by poster suppliers, or a set of tubes and closures can be supplied in a kit or pack.

[0030] Figure 4 shows a second embodiment closure 40 which is identical to the first shown in Figure 2, but is marked by printing, embossing or any similar means to indicate how to use the closure. The outer 'ring' 42 on the upper surface is indicated for the benefit of the person closing the tube 30 prior to sending, and ensures they do not accidentally break the inner breakable seal 44. The breakable seal 44 is similarly marked to indicate how the end customer can access their product, and that damage to the seal indicates tampering which should alert them to contact the postal authorities or the sender.

[0031] Figure 5 shows a third embodiment closure 50, which employs a different shape and style of breakable seal region 54 within the outer part 52. Specifically, the breakable seal 54 is a narrow rectangle with one narrow end not perforated and the other indicated as the preferred push point. This arrangement maximises the surface area which the packer uses to locate the closure 50 within the tube open end, and, because one end is not perforated, the broken region forms a tab rotatable about a fold line that prevents its removal and potential littering.

[0032] Figure 6 shows a fourth embodiment closure 60 in which a plurality of ribs 62 are provided on the external

surface of the perimeter wall, extending vertically from a position between (but not necessarily from) the lowermost edge of the wall and the upper surface. The ribs 62 are distributed generally evenly around the perimeter wall, spaced apart from one another. The ribs 62 have a profile that tapers outwardly towards the upper surface to provide a wedge shape, as best seen with reference to the ribs on the opposite sides of the wall. The thickness of the ribs 62 at the point where they meet or reach the upper wall is arranged as to be the same, or just greater than, the internal diameter of a tube 30 (see Figure 7) within which the closure 60 is to locate. This ensures that the closure 60, when inserted, wedges firmly within the tube 30 at the point where the closure's upper surface and the upper edge of the tube are substantially flush, as shown in Figure 7. The closure 60 is prevented from moving further inside the tube 30.

[0033] This arrangement of ribs 62 is applicable to any previous embodiment, i.e. instead of using horizontal ribs. Otherwise, the features of the breakable region as previously described are present in the closure 60.

[0034] In summary, there is described a poster closure system that locates snugly within the open end of a poster tube in a flush-arrangement, making it very difficult to grip and remove. The only realistic way of removing the closure is to break the breakable region, offering an immediate visual confirmation that the contents may have been tampered with.

[0035] It will be appreciated that the above described embodiments are purely illustrative and are not limiting on the scope of the invention. Other variations and modifications will be apparent to persons skilled in the art upon reading the present application.

[0036] Moreover, the disclosure of the present application should be understood to include any novel features or any novel combination of features either explicitly or implicitly disclosed herein or any generalization thereof and during the prosecution of the present application or of any application derived therefrom, new claims may be formulated to cover any such features and/or combination of such features.

Claims

1. A tube closure, comprising a plug member for locating substantially entirely within an open end of a tube, the plug member being provided with a breakable region configured in use to be broken by user action in order to enable access beneath to enable its extraction from a tube within which it is located.

2. A tube closure according to claim 1, wherein the plug member comprises an upper surface with a downwardly extending side wall from the perimeter of said upper surface, the side wall being dimensioned so as to provide in use a firm fit within one end of the tube.

3. A closure according to claim 1 or claim 2, wherein the upper surface is generally planar with no upstanding projection or perimeter wall so that in use it can fit flush with the end of a poster tube.

4. A closure according to any preceding claim, wherein the breakable region is formed within, and spaced apart from, the perimeter.

5. A closure according to any preceding claim, wherein the breakable region is defined by a plurality of perforations or a line of weakness.

6. A closure according to claim 5, wherein the perforations or line of weakness defines a tab-like breakable region part of which is not breakable.

7. A closure according to claim 2 or any claim dependent thereon, wherein one or more ribs are provided on the perimeter wall.

8. A closure according to claim 7, wherein a plurality of ribs are provided, distributed around and projecting from the side wall, which ribs extend generally vertically from a position between the lower edge of the side wall and the upper surface with a tapering external surface that increases in thickness towards said upper surface.

9. A closure according to any preceding claim, formed of polyethylene.

10. A plug-like tube closure, dimensioned and arranged for locating within an end of a tube, the tube closure comprising a closure surface with a substantially planar upper face and a lower face, wherein a perimeter wall extends downwardly, substantially transverse to the closure surface, for gripping the wall of a poster tube when inserted, and wherein the upper face has a frangible or weakened area spaced apart from the its perimeter which is arranged in use to be broken by user action to permit removal of the plug member and provide a visible indication of being broken.

11. A tube storage system, comprised of a hollow cylindrical tube with at least one open end, and a removable closure shaped and dimensioned to close-off the open end in accordance with any preceding claim.

12. A tube storage system, comprised of a hollow tube with at least one open end, and a removable plug member shaped and dimensioned to close-off the open end, wherein the plug member on its upper external side has no upstanding projection or lip so that it can fit flush within the tube's open end, wherein on its lower external side has a substantially transverse perimeter wall dimensioned to form a tight fit

within the interior of the tube, and has a breakable region accessible from the upper external side which is configured to be broken by user action to enable extraction of the plug from the tube from underneath.

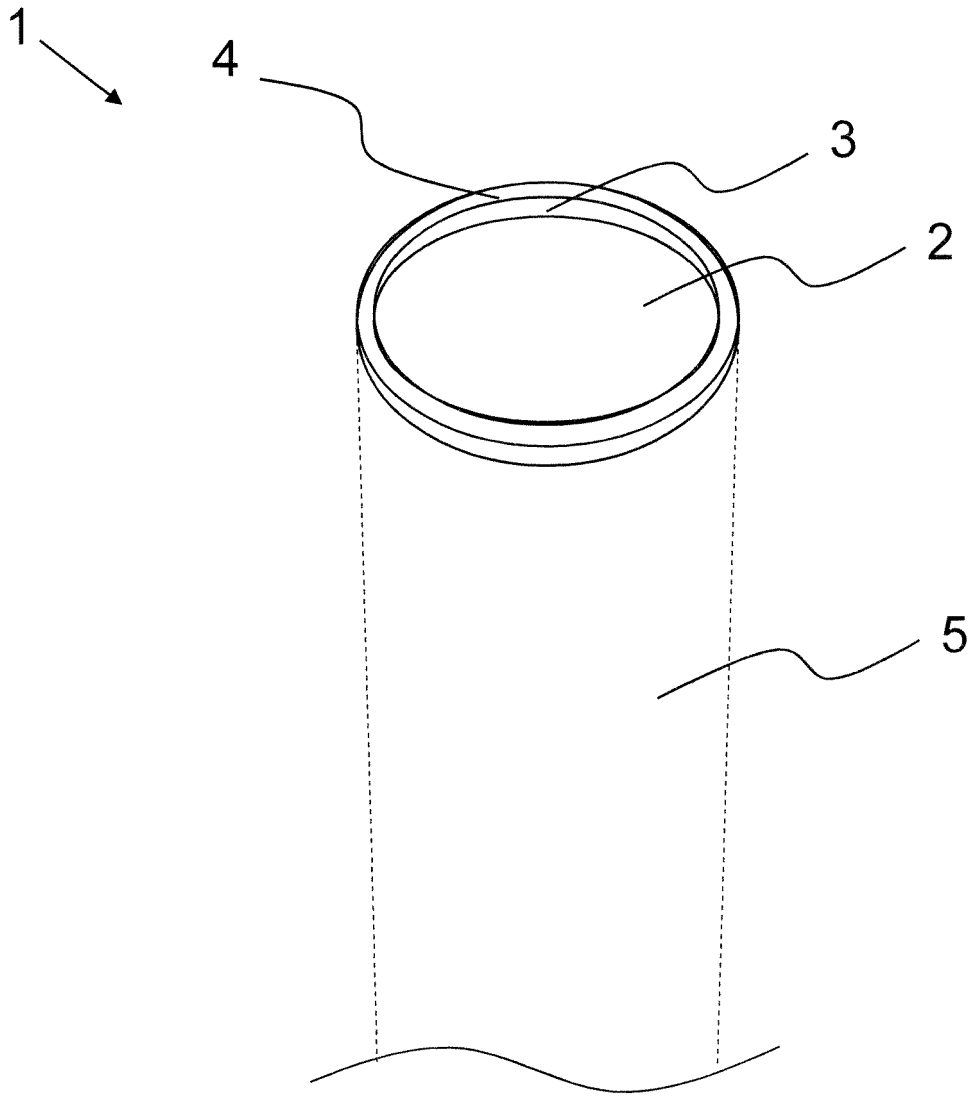
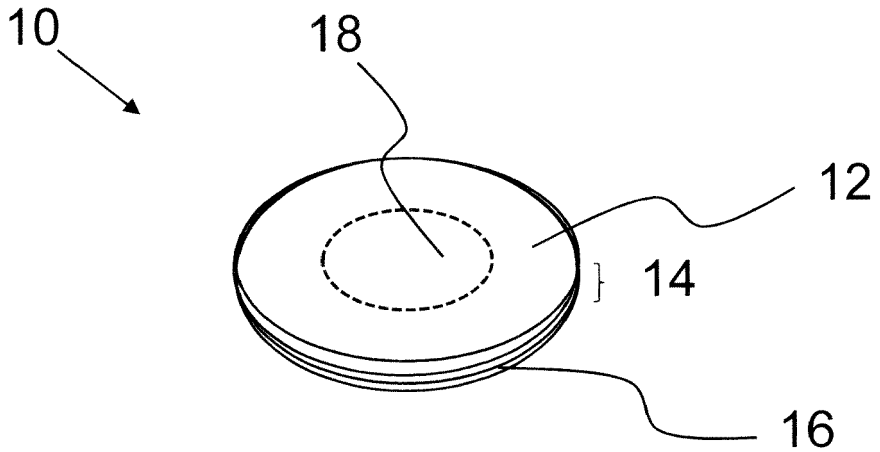
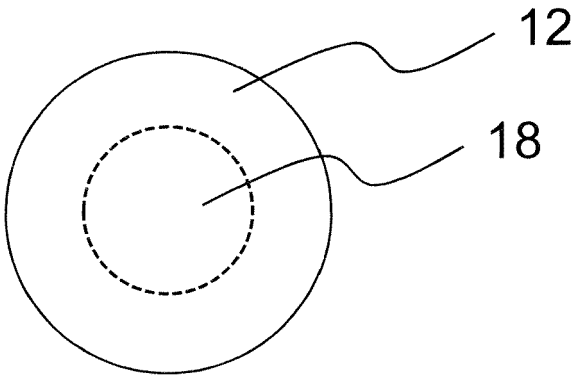


Fig. 1



(a)



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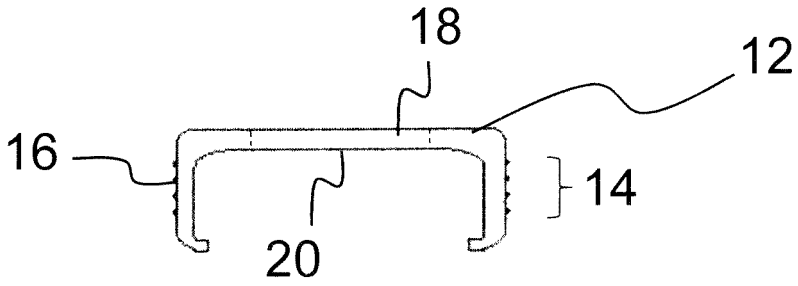

(c)

Fig. 2

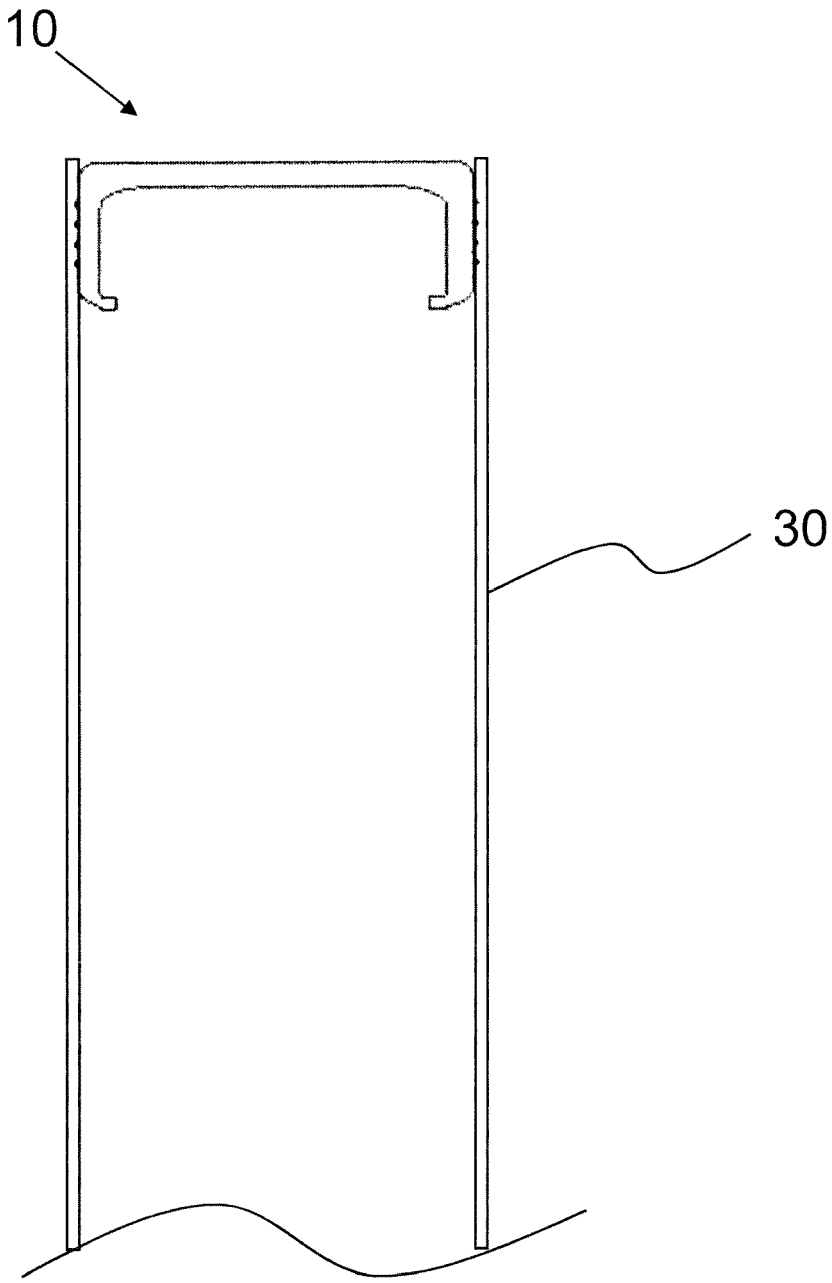

Fig. 3

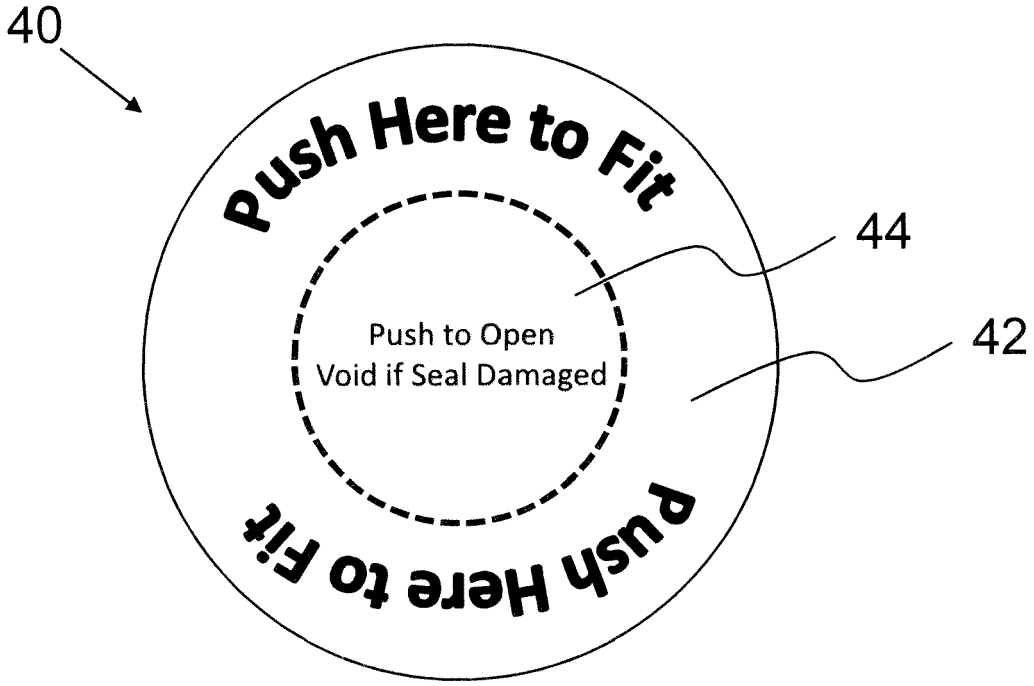
40
Push Here to Fit
Push to Open
Void if Seal Damaged
Push Here to Fit
44
42

Fig. 4

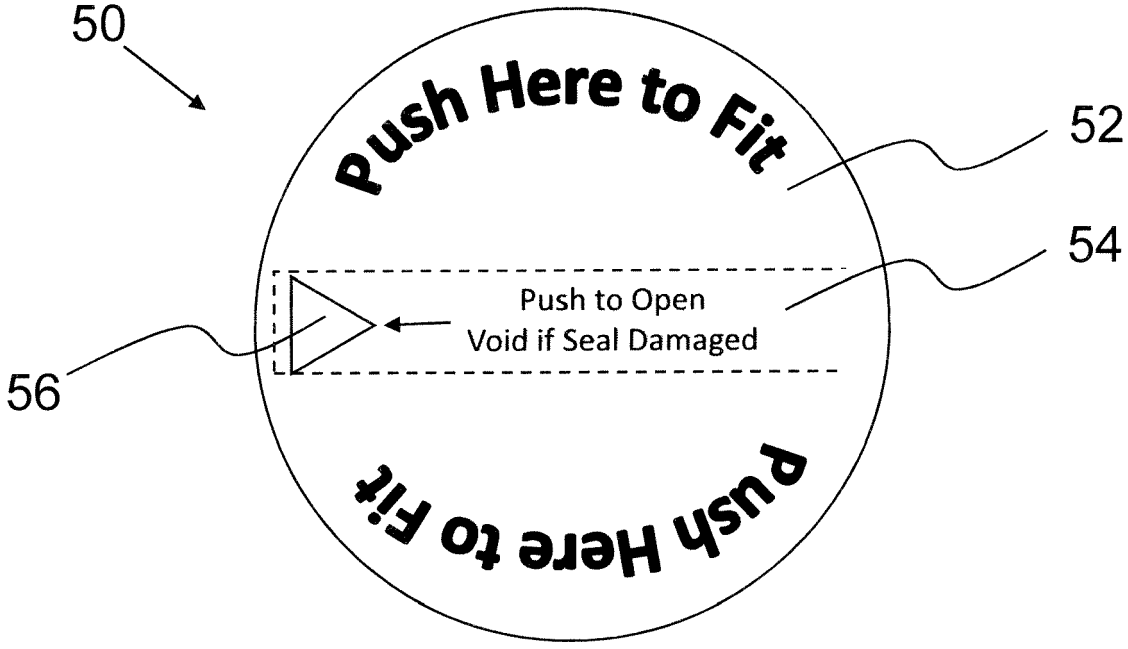
50
Push Here to Fit
Push to Open
Void if Seal Damaged
Push Here to Fit
52
54
56

Fig. 5

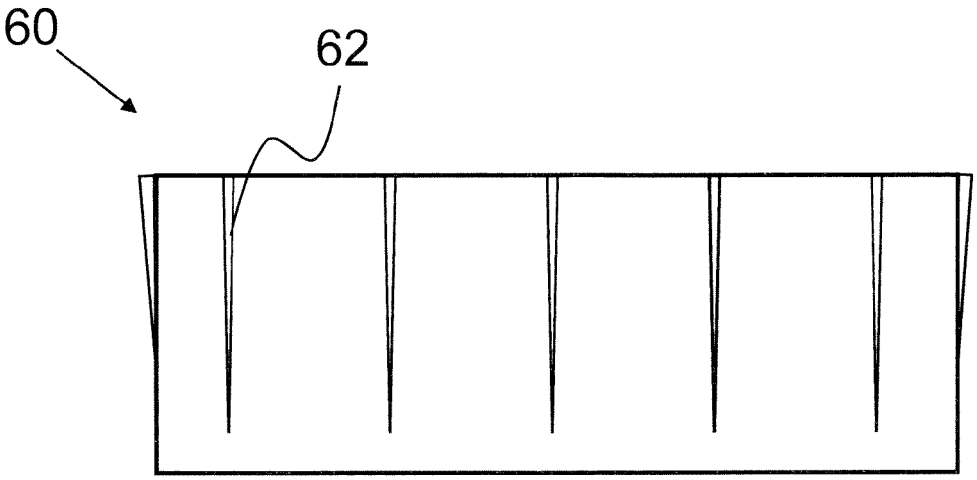

Fig. 6

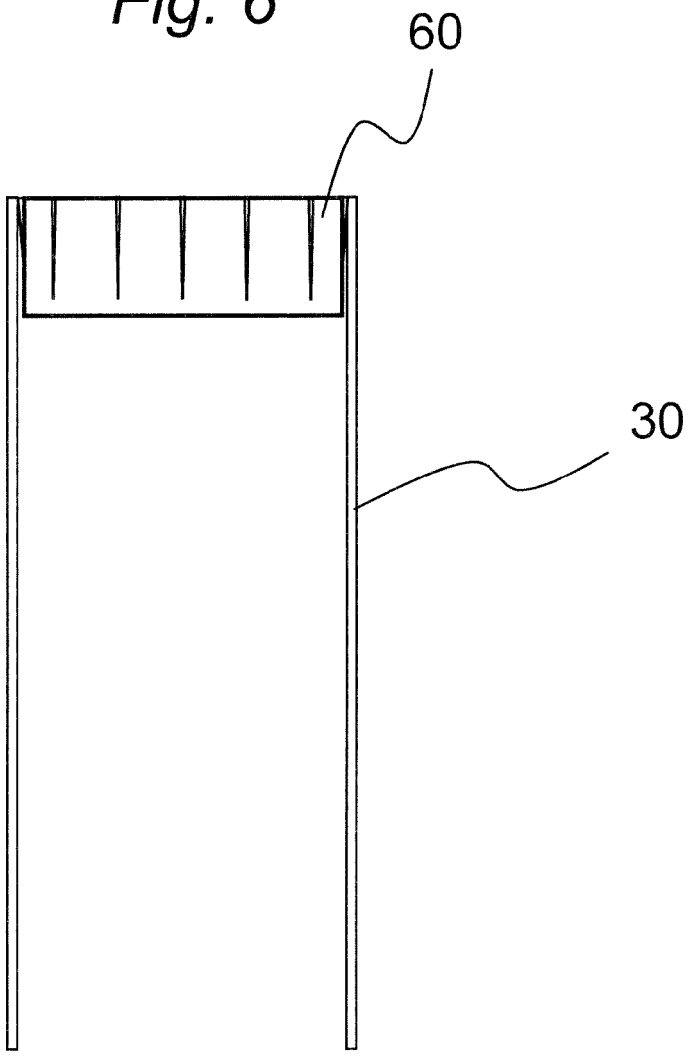

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 16 25 0007

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	FR 2 500 411 A1 (LINCRUSTA [FR]) 27 August 1982 (1982-08-27) * page 2, line 21 - page 3, line 10; figure 1 *	1-12	
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A	US 4 700 867 A (DUTT HERBERT V [US] ET AL) 20 October 1987 (1987-10-20) * column 5, line 40 - column 6, line 14; figures 1-5 *	1-12	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 September 2016	Derrien, Yannick

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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