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(54) **Re-sealable container and method of manufacturing it**

(57) A re-sealable container (1) comprising a base (5) and at least one removable lid (13, 15), wherein the container (1) is made substantially of cartonboard and

has a uniform cross-section along its length, wherein the cross-section is substantially oval.

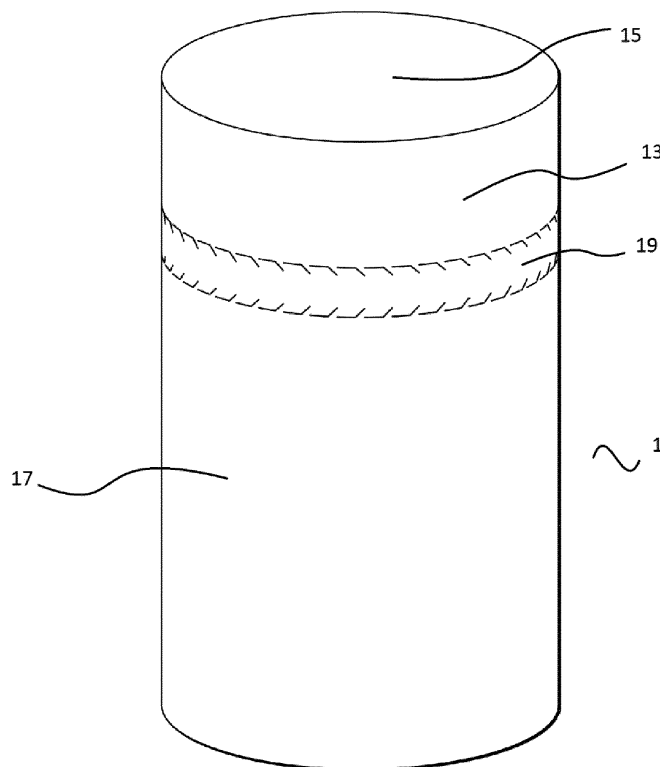


Fig. 1a

Description

[0001] The present invention relates to packaging for food products, such as coffee.

[0002] Coffee and other granular food products, such as loose leaf tea, hot chocolate powder, stock/sauce granules are often provided in glass jars. The glass jars are sealed by a plastic lid. Although both of these components can be re-cycled, such packaging is not considered to be environmentally-friendly. The glass jars are heavy and bulky, which adds to the cost and environmental impact of transporting the product to market and transporting the empty packaging for recycling. Furthermore, a significant proportion of the cost of the product to the consumer is the cost of the packaging.

[0003] Recent alternatives to the traditional glass jar packaging have included flexible pouches, which are used to package re-fills of the food product to then be emptied into a glass jar by the consumer. Such re-fill pouches have not been well-received because of the inconvenience of emptying the pouches. It is also understood that re-fill pouches are not aesthetically pleasing to the consumer, which discourages purchase of luxury food products, such as coffee.

[0004] The present invention sets out to provide packaging for food products, which alleviates the problems described above by providing a container, which can be easily transported and recycled, whilst being aesthetically pleasing to a user.

[0005] In one aspect, the invention provides a re-sealable container comprising a base and at least one removable lid, wherein the container is made substantially of cartonboard and has a uniform cross-section along its length, wherein the cross-section is substantially oval.

[0006] By providing a container, including a lid, which is made substantially of cartonboard the present invention offers significant environmental advantages. The container is easy to recycle and is light-weight for transportation when compared with plastic or glass containers. The oval-shape of the container is aesthetically pleasing to the consumer. The removable lid allows the container to be conveniently opened and re-sealed, to ensure that the product is kept fresh for the desired shelf-life.

[0007] Preferably, the container further comprises an internal collar member around at least the opening of the body of the container.

[0008] It is understood that the opening of the container is the aperture through which the contents of the container can be removed during use, i.e. when the lid is removed. The internal collar member reinforces the opening of the container to ensure that the lid can be securely removed and re-fitted. Furthermore, the internal collar member acts as a funnel to allow for the contents of the container to be conveniently removed and re-inserted as required.

[0009] Preferably, the internal collar member comprises a seam wherein the seam of the internal collar member does not overlap with the seam of the body of the con-

tainer.

[0010] Preferably, the internal collar member is adhesively sealed to the internal wall of the container.

[0011] More preferably, the internal collar member is sealed to the internal wall of the container by a plurality of spots of adhesive.

[0012] By ensuring that the seam of the internal collar and the seam of the body of the container do not overlap, the main body of the container can be heat-sealed without the risk of heat affecting the adhesive holding the internal collar and the container body together.

[0013] Preferably, a face of the lid is co-planar with the opening of the container.

[0014] Optionally, a face of the lid is recessed into the body of the container.

[0015] Preferably, a face of the base is recessed into the body of the container.

[0016] Optionally, a face of the base is co-planar with the opening of the container.

[0017] Preferably, the oval-shaped face of the lid and/or the base are surrounded by a perimeter flange, wherein the flange comprises a plurality of tabs.

[0018] Optionally, each tab is separated by a tear or split in the perimeter flange.

[0019] Preferably, each tab is substantially trapezoidal.

[0020] The tabs allow the face of the lid/base to be sealed to the internal wall of the container; for example by heat-sealing. Trapezoidal tabs allow for tight seal between the lid/base and the internal walls of the container, while minimising wastage and time in cutting the tabs from the perimeter flange.

[0021] Preferably, the container further comprises at least one removable strip around the circumference of the container, which is removable to allow the or each lid to be removed from the container.

[0022] More preferably, the at least one removable strip is surrounded by perforations, which allow the strip to be torn from the container.

[0023] A "tear strip" ensures that the container is "tamper-proof" during transportation and at the point of sale. The tear strip securely seals the container to ensure that the contents therein are kept as fresh as possible.

[0024] Preferably, the at least one removable strip comprises a first and a second parallel line of perforations wherein each perforation of the first parallel line is aligned with the corresponding perforation of the second parallel line.

[0025] Two parallel lines of perforations ensure that accidental removal of the "tear strip" is avoided and that the container is securely sealed prior to opening. Furthermore, this tear-strip configuration ensures that that tear-strip can be conveniently removed as single piece, without the risk of the strip breaking part-way through removal.

[0026] Preferably, each perforation has a length of about 5mm and/or each perforation is separated from the adjacent perforation by a distance of about 1mm.

[0027] Preferably, the container has a height of about 152mm; and the oval cross-section of the container has a major axis of length about 100mm and a minor axis of length about 70mm.

[0028] Within this specification, the term "about" is interpreted to mean optionally $\pm 20\%$, preferably optionally $\pm 10\%$, more preferably optionally $\pm 5\%$.

[0029] The cartonboard material of the present invention is selected to allow the weight of the container to be minimised, whilst the quality of presentation and security of the product contained therein is maximised.

[0030] Preferably, the container is made of a cartonboard material coated with polyethylene (PE), or polypropylene (PP) or polyethylene terephthalate (PET).

[0031] A suitable plastic coating allows the container to keep the contents fresh for the desired shelf-life, without affecting the recycling of the container.

[0032] Preferably, the surface of the container is suitable for supporting printed matter.

[0033] More preferably, the ink printed onto the surface of the container is not affected by heat-sealing.

[0034] The inks selected for use on the exterior of the container are carefully selected to provide a uniform finish so that any printed matter supported on the exterior is not dulled or distorted by heat sealing, for example, along the seams of the container.

[0035] In a second aspect the present invention provides a method of manufacturing a cartonboard container having a substantially oval cross-section and at least one removable lid, wherein the method comprises the following steps:

- i) rolling at least one cartonboard blank around a mandrel to form a hollow tube having a substantially circular cross-section;
- ii) sealing the hollow tube along a seam;
- iii) clamping the hollow tube to form a hollow tube having a substantially oval cross-section;
- iv) inserting an oval lid through the hollow tube from a first to a second end of the tube and sealing the oval lid to the second end of the hollow tube;
- v) inserting at least one product into the hollow tube;
- vi) inserting an oval base into the first end of the hollow tube and sealing thereto.

[0036] The method of manufacturing of the present invention ensures that the food product can be securely sealed within the container, whilst ensuring that the aesthetically pleasing oval cross-sectional shape of the container can be achieved. The method of the present invention ensures that a flexible pack can be manufactured to achieve an oval-shape without damage being caused to the pack or deformation of the shape during sealing.

[0037] Preferably, the method further comprises rotating the container between steps i) to iv).

[0038] Rotating the container between the steps of manufacture ensure the efficiency of the method, with minimal or no need for human intervention.

[0039] Preferably, the method of manufacturing a cartonboard container having a substantially oval cross-section and at least one removable lid further comprises the step of folding the cartonboard blank prior to rolling to reinforce the container.

[0040] More preferably, an internal collar portion is folded and sealed to the blank prior to rolling the blank into a hollow tube.

[0041] An internal collar folded and sealed to the blank provides re-inforcement around the opening of the container, in use, so that the contents of the container can easily be removed and so that the lid can be used to securely re-seal the container.

[0042] Preferably, the method of manufacturing a cartonboard container having a substantially oval cross-section and at least one removable lid, comprises heat-sealing of the tube an/or lid and/or base.

[0043] For the purposes of clarity and a concise description, features are described herein as part of the same or separate embodiments; however it will be appreciated that the scope of the invention may include embodiments having combinations of all or some of the features described.

[0044] The invention will now be described by way of example with reference to the accompanying diagrammatic drawings, in which:-

Figure 1a is a perspective view from above of an oval-shaped container in accordance with a first embodiment of the present invention;

Figure 1b is a perspective view from below of an oval-shaped container in accordance with the first embodiment of the present invention shown in Figure 1;

Figure 1c is a plan view from below of the recessed base, of the embodiment shown in Figure 1;

Figure 1d is a plan view from above of a blank from which an embodiment of the container of the present invention is formed;

Figure 2 is a schematic plan view from above of the forming machine used to manufacture the container of the present invention;

Figure 3 is a perspective view from above of an oval-shaped container in accordance with a second embodiment of the present invention, and;

Figure 4 is a perspective view from above of an oval-shaped container in accordance with a third embodiment of the present invention, and;

Figure 5 is a perspective view from above of an oval-shaped container in accordance with a fourth embodiment of the present invention.

[0045] Referring to Figures 1b and 1c, the base 3 of the container 1 has an oval-shaped face 5 with a major axis of length 100mm and minor axis of length 70mm. The oval face 5 of the base 3 is surrounded by a perimeter flange 7. The perimeter flange 7 is split by multiple transverse notches or tears 9, which are equally spaced from each other at a separation of about 10mm, to form multiple tabs 11 around the oval face 5. Each of the tabs 11 is substantially trapezoidal in shape. Referring to Figure 1a, the lid 13, 15 of the container also has an oval-shaped face 15 of the same dimensions as the oval-shaped face 5 of the base 3. The oval-shaped face 15 of the lid is surrounded by the perpendicular side-walls 13 of the body 17 of the container. The body 17 of the container 1 comprises a hollow tube 17 with an oval cross-section. In a preferred embodiment, the hollow tube 17 is attached to the lid 13 by a perforated "tear-strip" 19 running around the container's circumference.

[0046] Referring to Figure 1d, the blank from which the container 1 is formed comprises a first rectangular body portion 21 of height/width 152mm and length 285mm and a second rectangular portion 23 of height/width 64mm and length 268mm. In use, the second rectangular portion 23 forms an internal collar 23. The first and second rectangular portions 21, 23 of the blank are separated by a fold line 25, which is cut part-way along its length. In use, the internal collar 23 strengthens the walls of the hollow tubular main body 17 and acts as a funnel when food products are inserted or removed from the container 1. The internal collar 23 also allows the lid 13, 15 to be removably attached for the container 1 to be re-sealable in use.

[0047] The cartonboard material from which the blank is formed, may be coated with a plastic or acrylic layer. For example, the container 1 is formed from a cartonboard material coated with polyethylene (PE), polypropylene (PP) or polyethylene terephthalate (PET). It is envisaged that the material from which the container 1 is produced can be adapted according to the food product to be contained therein. The outer surface of the container 1 can support printed matter, for example, to display advertising or preparation instructions and the combination of ink or varnish coating the outer surface is carefully selected to prevent any dulling of the appearance of the outer surface of the container 1 when the container 1 is heat-sealed.

[0048] Referring to Figure 1d, the first rectangular blank 21 comprises a perforated "tear-strip" 19 of width 13mm running along its length. In a preferred embodiment, the tear-strip 19 comprises multiple equally spaced perforations 25, for example, Concorra perforations. There are two parallel rows of perforations 25 at around 1mm from the upper and lower edges of the tear-strip 19. The perforations 25 on the upper edge are aligned with the perforations on the lower edge of the tear-strip 19. Each perforation 25 is of length 5mm with a separation of 1mm between perforations. In use, when the tear strip 19 is removed from the container 1 a firm force must

be applied. The configuration of the tear-strip 19 ensures that there is no risk of accidental removal and opening of the container and also that the tear-strip 19 will be removable as a single piece. In alternative embodiments, as shown in Figures 1a, 1b, 3, 4 and 5 the tear strip has a different formation of perforations, wherein there are two parallel lines of perforations. The perforations of the first and second parallel lines are each aligned with each other. The perforations of this alternative embodiment are shaped such that one end of each perforation slopes at an obtuse angle towards the centre of the tear strip.

[0049] Referring to Figure 2, to manufacture and form the container 1 of the present invention the blank 21, 23 is fed into a forming machine 31 and spots of adhesive are applied in dots along the length of the internal collar 23. However, no adhesive is applied at the seam of the internal collar, i.e. in the area where the ends of the second rectangular collar portion overlap each other to form the internal oval-shaped reinforcing ring. This prevents the risk of adhesive on the internal collar interfering with heat sealing of the container or vice versa. Furthermore, when the container is formed into a hollow tube, the seam of the internal collar 23 does not overlap with the seam of the hollow container body 17.

[0050] In a first step to forming the container of the present invention, the non-printed (internal) face of the internal collar 23 is folded against the non-printed (internal) face of the rectangular body portion 21 of the blank, so that both components 21, 23 are sealed together by the dots of adhesive. The resulting rectangular blank is then folded around a revolving mandrel 27 to form a hollow tube having a substantially circular cross-section and a seam 29 along its length. The hollow tube is then heat-sealed along the seam. The heat-sealed seam 29 is not continuous, with a gap or break in the heat-sealing across the tear-strip 19. In use, this gap allows a user to easily grip the tear-strip 19 for opening of the container.

[0051] Referring to Figure 2, the hollow circular tube 17 is gripped by a former 33 to compress the hollow tube 17 and form an oval cross-section. The forming machine comprises 5 or 6 rotating formers/clamps 33 to rapidly form multiple oval-shaped hollow tubes 17. Each oval-shaped hollow tube 17 is clamped and transported around the forming machine to meet the oval-shaped face of the lid 15.

[0052] The oval-shaped face of the lid 15 is inserted through the hollow tube 17. The lid 15 is pushed through from a first (base) end of the tube 17 to a second (lid) end of the tube 17. The lid 15 is pushed by an oval-shaped press of the same cross-section as the oval-shaped face until the lid 15 is flush with the perpendicular side walls 13 of the hollow tube 17, i.e. the lid is co-planar, with the opening of the hollow tube 17. The tabs 11 around the perimeter flange 7 of the lid rest against the internal walls of the container 1. With the lid 15 held in place by the oval-shaped press, the lid 15 is externally clamped by an oval-shaped clamp 33 and heat-sealed so that the multiple tabs 11 around the perimeter flange 7 of the lid 15

are secured to the inner face of the perpendicular side walls 13 of the container 1.

[0053] The container 1 is then filled from the first end of the tube 17, i.e. from the base 3 of the tube 17, with the product 35 to be contained therein. As shown in Figure 2, the products 35 are transported to meet the container along a conveyor belt 37. For example, coffee granules are inserted with a portion of the granules contained in a foil pouch. Multiple pouches, for example six pouches, are inserted into the hollow tube 17 in a single insertion process. For example, a cage is used to insert multiple pouches/sachets. It is envisaged that many different types of food stuff can be inserted into the container 1, for example, loose leaf tea, sauce/stock granules, biscuits, chocolates etc.

[0054] The filled, lidded tube 17 is then transported to meet the base 3, which also comprises an oval-shaped face 5 having a perimeter flange 7 with multiple tabs 11. As described regarding insertion of the lid 15, an oval-shaped press is used to push the base 3 a distance of around 5mm into the lidded tube 17 from the first (base) end of the tube 17. The multiple tabs 11 fold back against the inner wall of the hollow tube 17 and the base 3 is recessed into the tube 17. The tube 17 is clamped externally by an oval-shaped clamp 33 and the multiple tabs 11 around the base 3 are heat-sealed to the tube 17 whilst the oval-shaped press holds the base 3 in place inside the tube 17. The sealed oval-shaped container 1 is then transported out of the forming machine to be printed with any relevant pack-specific information, such as a best-before date.

[0055] The pressure applied by the oval presses to move the lid 15 or base 5 through the tube 17 is carefully controlled to allow the lid or base to slightly flex to accommodate movement through the tube. However, any flexing of the lid 17 or base 5 does not cause creasing. For example, the oval presses are spring-loaded.

[0056] Referring to Figures 3, 4, and 5, in alternative embodiments of the present invention the configuration of how the oval-face 15 of the lid 13 and the base 3 are fixed to the container 1 are varied. As shown in Figure 3, the oval face 15 of the lid 13 is recessed into the container body 17 in the same way as the base 3 is fixed to the container 1 in the first embodiment. That is, the oval face 15 is pushed through from the second (lid) end of the tube. Whether the lid/base are recessed into or flush with the opening of the container body 17 is determined by how the lid/base are inserted. If the multiple tabs 11, 11' of the perimeter flange are inserted first then the oval face 5, 15 is flush with the opening. If the oval face 5, 15 is inserted first then the oval face is recessed into the opening. In use, the lid 13 is still "push-fit" with the walls of the container body 17 to allow the container 1 to be re-sealed, as described below. In the second embodiment shown in Figure 3, the base is flush with the opening of the container body 17.

[0057] In a third embodiment of the present invention, which is shown in Figure 4, both the base and the oval

face of the lid 13 of the container 1 are flush with the respective openings of the container body 17. In a fourth embodiment of the present invention, which is shown in Figure 5, both the base and the oval-face 15 of the lid 13 of the container 1 are recessed into the respective openings of the container body 17.

[0058] In use, to open the container 1, the tear-strip 19 around the circumference of the container body 17 is torn away in a single piece to allow the lid 15 of the container 1 to be removed. The lid 15 comprises the oval face and upper side walls 13 of the container body 17. Removing the lid 15 allows a user to access the contents of the container, for example, the sachets of coffee granules, before the lid 15 is fitted back on to re-seal the container 1. The lid 15 is a push-fit with the container body 17 and the opening of the container is re-inforced by the internal collar 23.

[0059] The above described embodiment has been given by way of example only, and the skilled reader will naturally appreciate that many variations could be made thereto without departing from the scope of the invention as defined by the claims.

Claims

1. A re-sealable container comprising a base and at least one removable lid, wherein the container is made substantially of cartonboard and has a uniform cross-section along its length, wherein the cross-section is substantially oval.
2. A re-sealable container according to claim 1 further comprising an internal collar member around at least an opening of the body of the container, wherein the opening is defined by removal of the lid, optionally wherein the internal collar member comprises a seam and the seam of the internal collar member does not overlap with a seam of the body of the container, optionally wherein the internal collar member is adhesively sealed to the internal wall of the container, optionally wherein the internal collar member is sealed to the internal wall of the container by a plurality of spots of adhesive.
3. A re-sealable container according to claim 1 or 2 wherein (i) a face of the lid is co-planar with the opening of the container, or (ii) a face of the lid is recessed into the body of the container.
4. A re-sealable container according to any preceding claim wherein (i) a face of the base is recessed into the body of the container, or (ii) a face of the base is co-planar with the opening of the container.
5. A re-sealable container according to any preceding claim wherein the face of the lid and the face of the base are oval shaped and are surrounded by a pe-

rimeter flange, wherein the flange comprises a plurality of tabs, optionally wherein each tab is separated by a tear or split in the perimeter flange, and/or wherein each tab is substantially trapezoidal.

6. A re-sealable container according to any preceding claim wherein the container further comprises at least one removable strip around the circumference of the container, which is removable to allow the or each lid to be removed from the container. 5
7. A re-sealable container according to claim 6 wherein the at least one removable strip is surrounded by perforations, which allow the strip to be torn from the container, optionally wherein the at least one removable strip comprises a first and a second parallel line of perforations wherein each perforation of the first parallel line is aligned with the corresponding perforation of the second parallel line. 10 15 20
8. A re-sealable container according to claim 7 wherein each perforation has a length of about 5mm and/or each perforation is separated from the adjacent perforation by a distance of about 1mm. 25
9. A re-sealable container according to any preceding claim wherein the container has a height of about 152mm; and the oval cross-section of the container has a major axis of length about 100mm and a minor axis of length about 70mm. 30
10. A method of manufacturing a cartonboard container having a substantially oval cross-section and at least one removable lid, wherein the method comprises the following steps: 35
 - i) rolling at least one cartonboard blank around a mandrel to form a hollow tube having a substantially circular cross-section;
 - ii) sealing the hollow tube along a seam; 40
 - iii) clamping the hollow tube to form a hollow tube having a substantially oval cross-section;
 - iv) inserting an oval lid through the hollow tube from a first to a second end of the tube and sealing the oval lid to the second end of the hollow tube; 45
 - v) inserting at least one product into the hollow tube;
 - vi) inserting an oval base into the first end of the hollow tube and sealing thereto. 50
11. A method of manufacturing a cartonboard container according to claim 10 further comprising the step of folding the cartonboard blank prior to rolling. 55
12. A method of manufacturing a cartonboard container according to claim 11 wherein an internal collar member is folded and sealed to the blank prior to

rolling the blank into a hollow tube.

13. A method of manufacturing a cartonboard container according to any of claims 10 to 12 comprising heat-sealing of the tube an/or lid and/or base.
14. A re-sealable container substantially as hereinbefore described or referred to in Figures 1, 3, 4 or 5.
15. A method of manufacturing a cartonboard container as hereinbefore described or referred to in Figure 2.

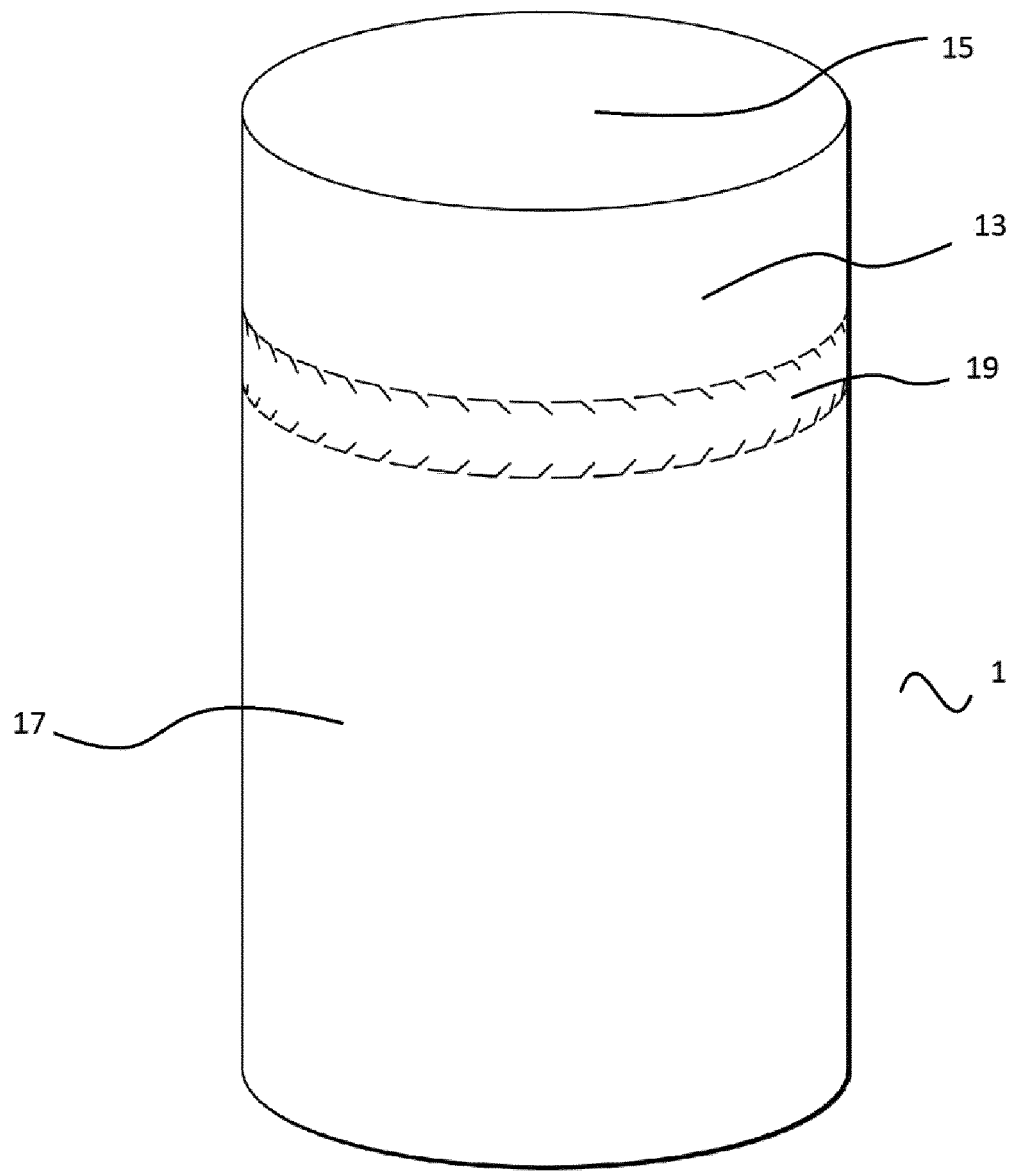


Fig. 1a

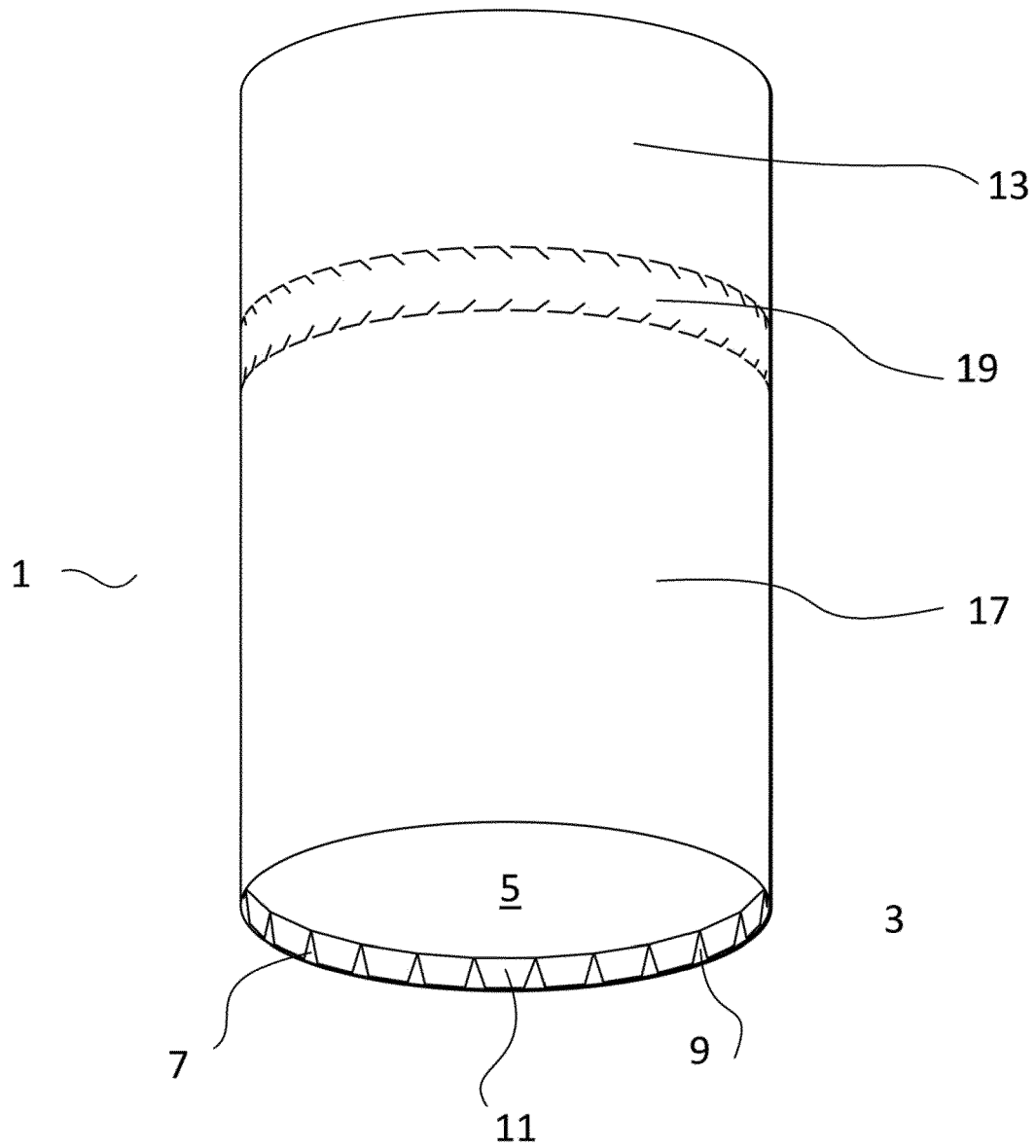


Fig. 1b

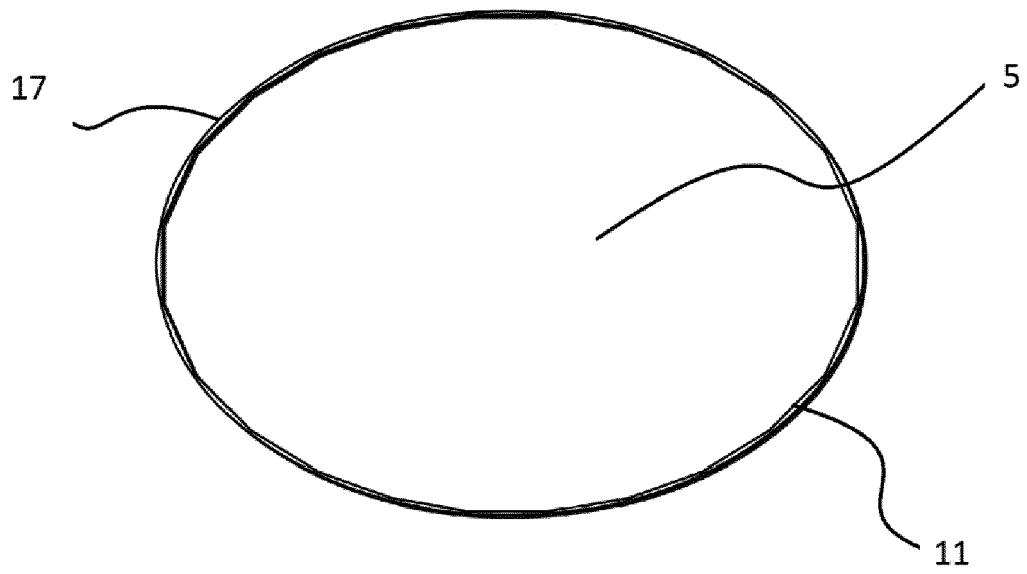


Fig. 1c

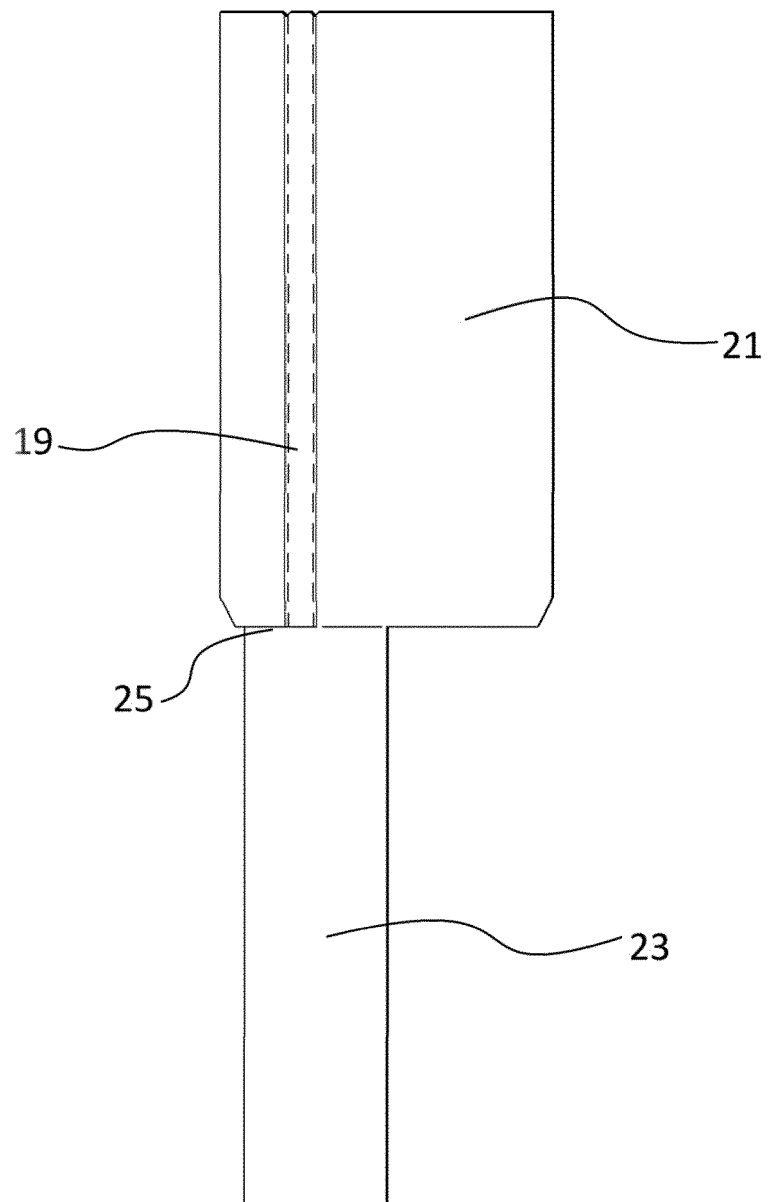


Fig. 1d

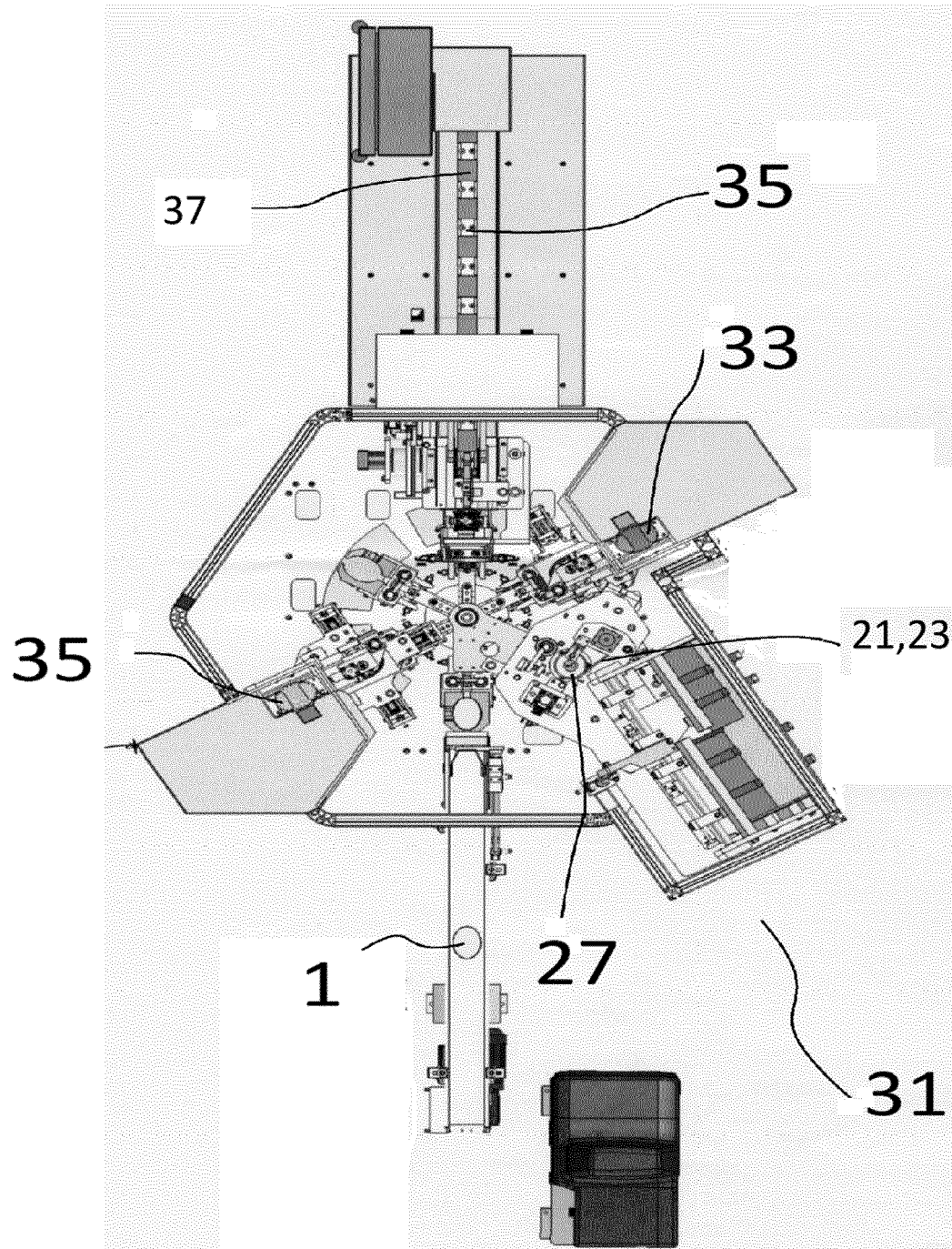


Fig. 2

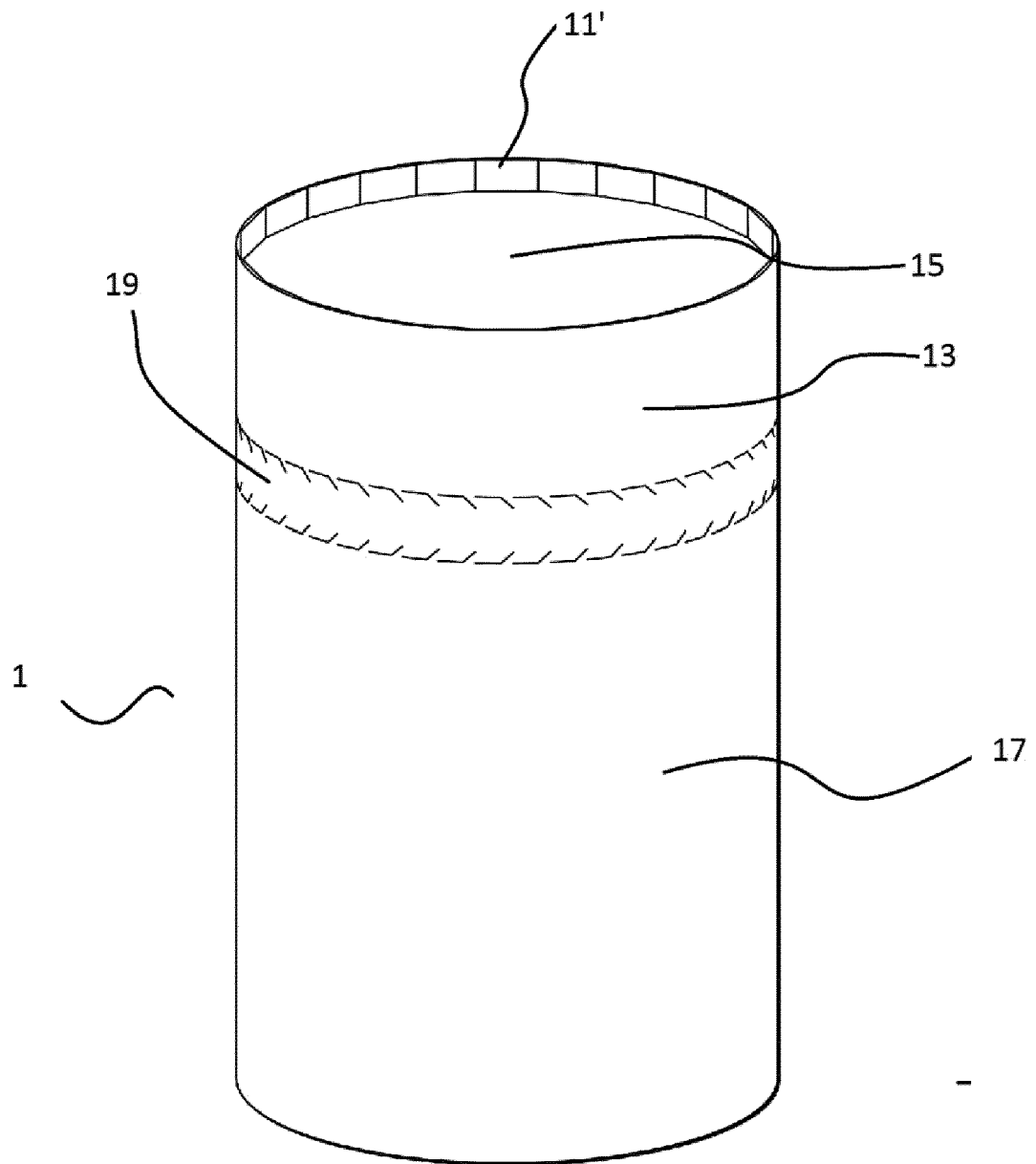


Fig. 3

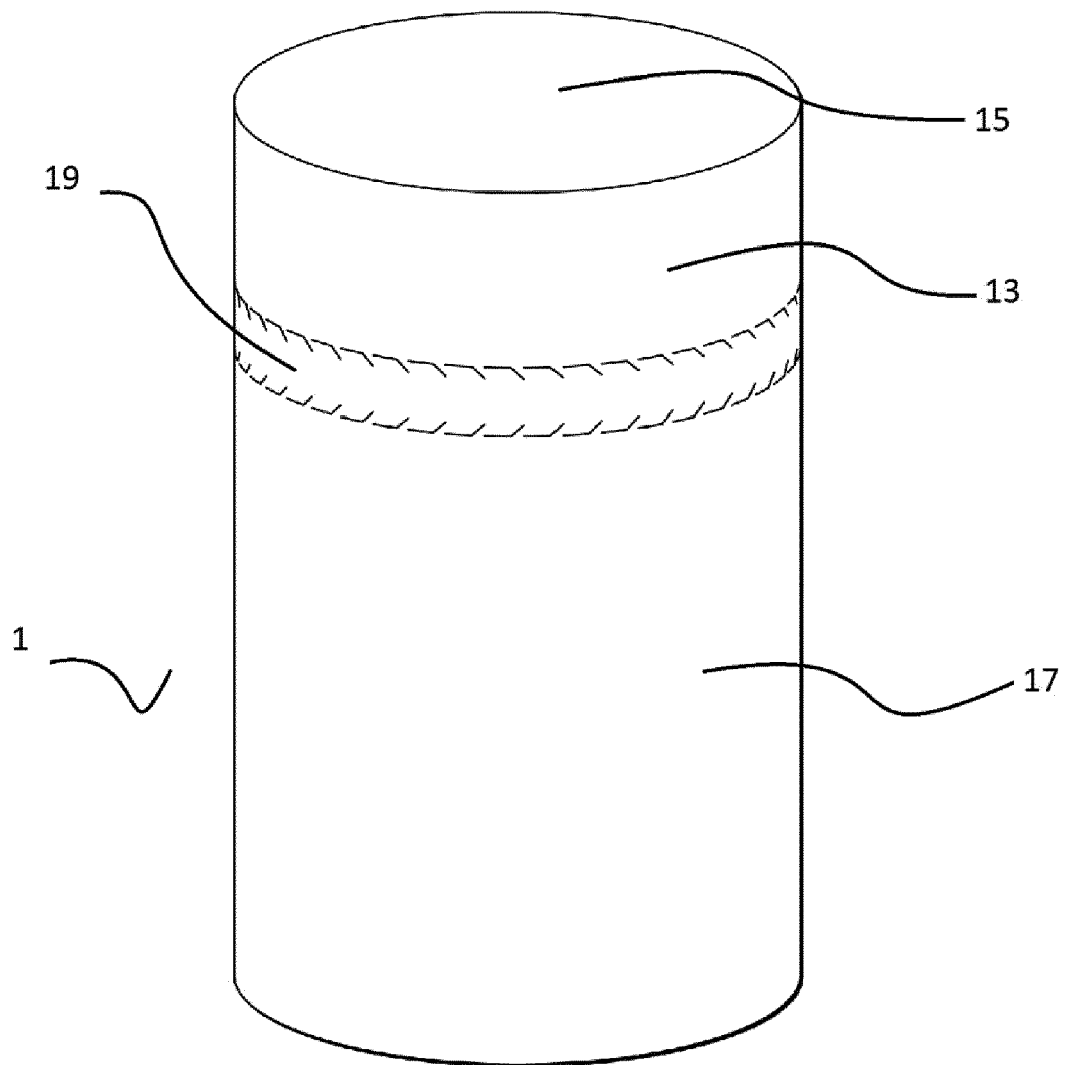


Fig. 4

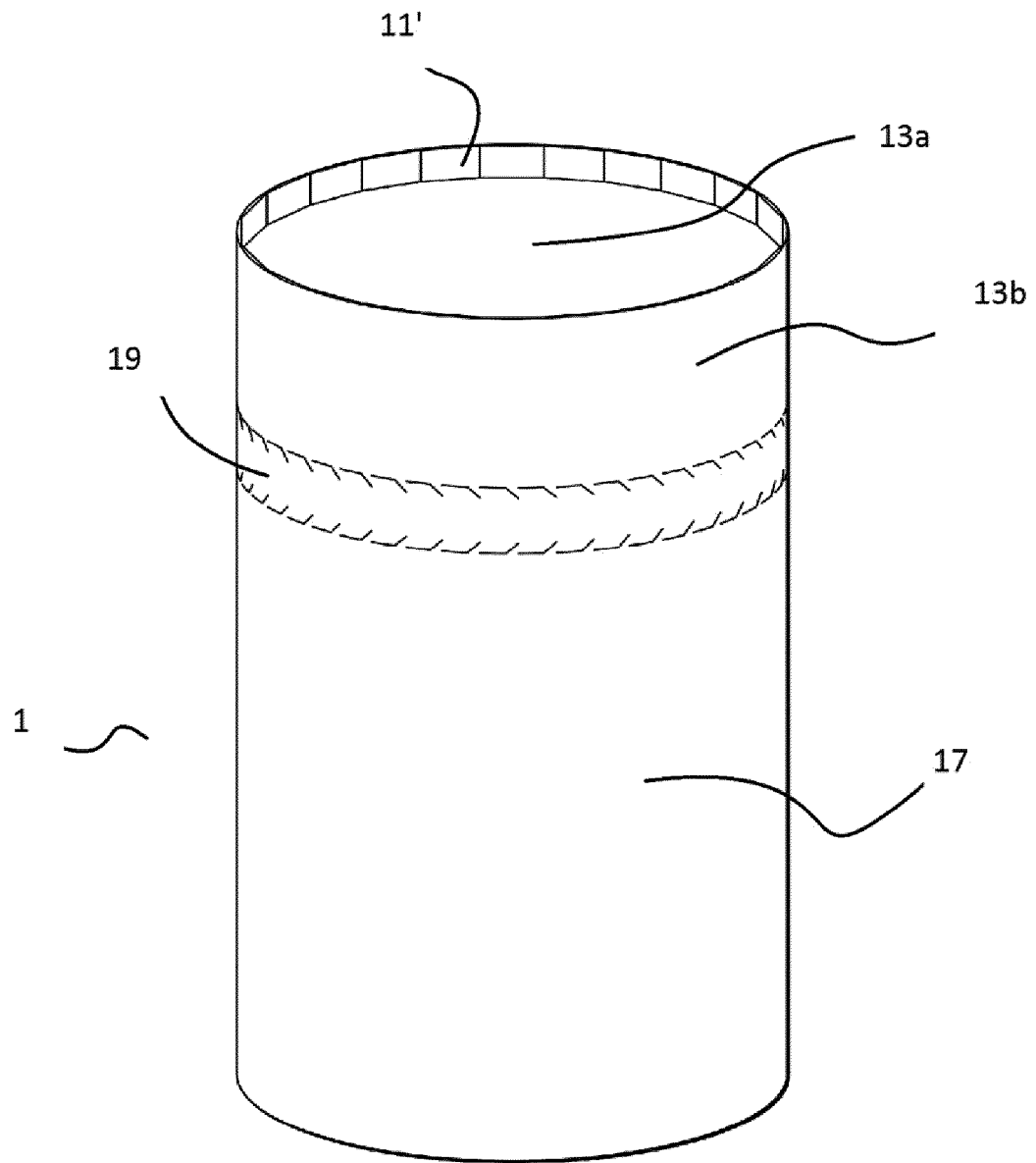


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 13 18 7266

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	* column 5, line 44 - line 52; figures 1-3 * * column 3, line 4 - line 11 *	10	
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Y	* figures 1,2,5-9 *	5	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 January 2014	Examiner Galli, Monia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
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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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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 January 2014	Examiner Galli, Monia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 18 7266

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-01-2014

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