(19) DANMARK

(10) DK/EP 3583047 T3

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: *B 65 D 77/24 (2006.01)* *B 65 D 25/02 (2006.01)* *B 65 D 51/20 (2006.01)* *B 65 D 51/24 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2025-06-10**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2025-04-16**

(86) Europæisk ansøgning nr.: **18713344.2**

(86) Europæisk indleveringsdag: **2018-02-14**

(87) Den europæiske ansøgnings publiceringsdag: **2019-12-25**

(86) International ansøgning nr.: **IB2018050906**

(87) Internationalt publikationsnr.: **WO2018150338**

(30) Prioritet: **2017-02-14 DE 102017102957** **2017-07-11 DE 102017115514**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(73) Patenthaver: **Trivium Packaging Group Netherlands B.V., Zutphenseweg 51, 7418 AH Deventer, Holland**

(72) Opfinder: **HORZ, Peter, Liebshausener Str. 12, 56291 Kisselbach, Tyskland**

(74) Fuldmægtig i Danmark: **AWA Denmark A/S, Strandgade 56, 1401 København K, Danmark**

(54) Benævnelse: **BEHOLDER MED EN STØTTEKONSTRUKTION MELLEM FORSEGLINGSMEMBRAN OG LÅG**

(56) Fremdragne publikationer:
WO-A1-2016/126191
FR-A- 1 077 437
FR-A1- 2 981 333

Description

[0001] The invention relates to the technical field of packaging technology. More specifically, the invention relates to the field of supporting a film or membrane sealed to the inside of a container, particularly during the filling of the container with a solid or liquid product or by introducing an overpressure. **0002**] In the manufacture of a filled container with a membrane sealed to the inside of the container or glued membrane, such as powdered coffee cans or baby food cans.

A packer, e.g. a powdered coffee manufacturer or baby food manufacturer, typically uses prefabricated container blanks produced by a packaging manufacturer.

produced by a packaging manufacturer. The container blanks are often labelled by the packaging manufacturer at their upper section (top

as a consumer finds the container in the supermarket) with the membrane and a press-in lid or a snap-on lid. The membrane is often

attached by a membrane collar which is glued to the inside of the container all the way round. The packer fills the container blanks from below and closes the underside of the container, for example by crimping. In this way, a filled container can be produced.

[0003] Filling from below is problematic for the tightness of a membrane sealed to the inside of a container. When the packer fills a solid or liquid product from below, the product hits the membrane. This exerts a not insignificant force

on the membrane surface (plane perpendicular to the container axis), which is transferred to the circumferential and axially extending bonding area between the membrane collar and the inside of the container.

side, whereby peeling forces act on the bondings,

which are particularly unfavourable for bonding. In addition, fumigation (e.g. with a protective gas) is often carried out in the room where the filling material is stored.

is activated. This typically occurs during filling

venting. If the lower opening of the container, through which the filling material and the gas were introduced, is closed, an overpressure can be created in the closed state in the space in which the filling material is stored compared to the

space, which is located on the other side of the membrane.

is located on the other side of the membrane. Accordingly, a further force can act on the membrane, which in turn is transferred to the bonding area between the membrane collar and the inside of the container and cannot easily absorbed by the bonding. Furthermore

an overpressure can occur in the space in which the product The membrane can also be caused to be stored in the closed state of the container if the filling is carried out without overpressure, if the container is stored after filling by the filler in a place that has a lower air pressure than the place of filling and the lower pressure acts on the side of the membrane that does not face the filling material.

air pressure than the filling location and the lower pressure acts on the side of the membrane that is not facing the product. Such air pressure differences

This can result, for example, from different heights of locations and from a space above the membrane (not the side of the membrane facing the filling material) that is at least not completely gas-tight. All of this can impair the integrity of the membrane bonding or even cancel it out completely.

[0004] A container according to the preamble term of claim 1 is known from FR1077437.

[0005] The invention is faced with the task of providing a container with a membrane attached or bonded to the inside of the container, wherein the force acting on the membrane bonding during filling from below is favourable for the bonding or can be endured well.

[0006] The problem is solved by a container according to claim 1, which can be used in a process for producing a filled container according to claim 13. Claim 14 describes the filling of the container with the support structure to protect the fastening band of the foil lid. The container comprises a container wall, a container opening, a lid, a membrane (or film) and a support structure. The lid closes the container opening. The membrane has a membrane collar and a section of the membrane collar is to an inner side of the container wall. An attachment area is formed in the area in which the section of the membrane collar is attached to the inside of the container wall. The support structure has a support section and a support section. The support section of the support structure is assigned to the membrane and the support section of the support structure is assigned to the lid.

[0007] The support structure can a force acting on the diaphragm (especially on the diaphragm base) in the direction of the cover (and the support structure), so that a resulting force acts in the fastening area whose shear component is greater than its peel component.

[0008] It is also possible that a force acting on the membrane (membrane base) in the direction of the cover or the support structure is deflected by the support structure in such a way that the resulting force acting in the fastening area has a greater shear component than the shear component of a force that occurs in the fastening area without application of the support structure (all other things being equal). In other words, by using the support structure, the shear component of the force acting in the fastening area can be increased compared to the force acting without using the support structure (all other things equal). This improves the load-bearing capacity of the fastening area.

[0009] The shear component of a force acting on the fastening area acts parallel to the fastening area and the peel component of a force acting on the fastening area acts parallel to the fastening area.

The force acting on the fastening area is perpendicular to the fastening area.

[0010] The attachment of the membrane (via the membrane collar) to the inside of the container wall can be realised by gluing or sealing.

be designed. For example, an adhesive can be applied to the side
of the membrane that is to be attached to the container wall. The adhesive agent can have adhesive properties without further treatment. The bonding agent can also be meltable, e.g. a polymer
(polyethylene). One of the adhesive agents can also be attached to the container wall, especially in the area, in which the membrane collar of the membrane is to be attached. One of the adhesive agents can be attached to the membrane collar
as well as on the container wall.

[0011] The membrane is preferably attached by the membrane collar in such a way that two spaces are formed in the container, which are separated from each other in a fluid-tight manner. In the case of spaces that are from each other in a fluid-tight manner, the exchange of substances between these spaces is
The mass transfer between two rooms is considerably (many times) smaller than the mass transfer between two rooms that are separated from each other but not separated from each other in a fluid-tight manner. The skilled person is aware that
a complete fluid-tight separation between two rooms is not (practically) realisable and even in fluid-tightly separated rooms a slight, often negligible, exchange of substances takes place. A slight exchange of substances already occurs through diffusive processes.

[0012] The membrane or film preferably has a thickness of less than 1 mm, especially less than 250 µm. It can be made of metal (especially aluminium), plastic, a coated plastic (especially coated with metal, especially aluminium), paper or cardboard.
and a composite material two or more of the materials. Specifically, the membrane comprises a plasma-coated plastic, wherein the coating comprises a metal.

[0013] The container can be a metallic container
be. Preferably, the container is a metal can. The container can be cylindrical.

[0014] The internal volume of the container in the closed state can be less than 25 litres, preferably less than 25 litres. than 10 litres, particularly preferably less than 5 litres, even more preferably less than
preferably less than 3 litres. The container can a height of less than 500 mm, preferably less than 300 mm, particularly preferably less than 150 mm. **[0015]** The container can have a circular (wall) cross-section. The outer diameter of the container
container or the container wall can be less than 300 mm, preferably less than 200 mm, particularly preferably less than 150 mm.

[0016] The lid can a press-in lid, a snap-on lid or a tear-open lid. As part of the
According to the invention, a "container" need not be an object whose openings are all completely closed. Typically, containers within the scope of the invention comprise
two openings on preferably opposite sides. One of the openings is closed with the lid. The other opening is typically open. A filling product can be placed in the open opening and the opening can then be closed so that the filling product is protected against "falling out". The product is then stored in a space inside the container that is bounded by a membrane, the container wall and the closure of the opening that was open before the product was inserted. Such a closure can be connected to the container wall by a flange. **[0017]** The fastening region, formed fastening a section of the membrane collar of the membrane to the container wall, can have an extension that is several times greater in the axial direction (z-direction) than in the radial direction (r-direction). **[0018]** The fastening area is typically the area in which the membrane collar is fastened to the container wall, for example by bonding. The fastening area ensures a secure attachment of the membrane (via the membrane collar) and ensures a secure separation of the space above the membrane from the space below the membrane.

[0019] Preferably, the support section of the support structure contacts the membrane.

[0020] Such a contact can also be partially formed so that the support section partially contacts the membrane. The contact is made without applying a force to the membrane, so that no additional force (caused or transmitted by the support section) has to be applied in the fastening area.

[0021] The support section can also not contact the membrane (claim 4). The non-contacting typically occurs in the basic state of the membrane. The basic state of the membrane is present when the pressure in the space above the membrane (in the space in which the support structure is arranged) is slightly greater than the pressure in the space below the membrane, whereby the membrane is not elastically or plastically deformed (for example, stretched). The slightly higher pressure is, for example, between 100 mbar and 200 mbar above the ambient pressure. **[0022]** Preferably, the support section contacts the membrane and a force is exerted on the membrane by the support section. The force can caused by the support section or a force can be transmitted or passed on by the support section. The force that acts on the membrane as a result is absorbed in the attachment area, for example bonding.

[0023] A gap is present between the support section and the membrane collar. When a gap is formed between the support section and the membrane collar (the closest surface of the membrane collar), the support section is located at least sectionally between the membrane collar and the support section.

the membrane collar. The gap is preferably fully formed.

[0024] The gap is preferably less than 20 mm, particularly preferably less than 10 mm, even more preferably less than 5 mm, especially less than 2 mm, in each case in the radial direction (r direction) perpendicular to the container wall. radial direction (r-direction) perpendicular to the container wall.

[0025] The support section can be annular in shape. In the circumferential direction, the support section can have a circular cross-section, a rectangular cross-section, especially a rectangular cross-section with rounded corners, or a square cross-section, especially a square cross-section. cross-section, a rectangular cross-section, especially a rectangular cross-section with rounded corners, or a square cross-section, especially a square cross-section with rounded corners.

with rounded corners. The support section can be connected to the support section with a material bond

. Preferably, the support structure is formed in one piece from the support section and the bearing section. [**0026]** The support section of the support structure can be

be connected to the lid. The support section is connected to the cover in such a way that the weight

of the support section or the support structure is completely can be held by the lid via the connection.

[0027] According to the invention, the support section comprises

a support element that is rod-shaped. Preferably preferably, the support section comprises three support elements, each of which is rod-shaped. The support section or the support sections specifically have a circular cross-section or a rectangular cross-section, at least in sections.

[0028] The lid can comprise a snap element, wherein an upper section of the support element is snapped into the snap element. The cover preferably comprises three snap-on elements, with the upper section of each snap-on element

section of three supporting elements into one snap-on element is miffed.

[0029] In this sense, a snap-fit connection is a connection between two elements, whereby at least one of the elements is deformed during the joining of the elements (connection) until a

end position of the elements relative to each other is reached and the deformed at least one element returns to its initial shape by elastic recovery. After resetting, the elements are

at least positively connected in the end position.

[0030] Typically, the snap connection can be released again by an analogous elastic deformation of at least one of the elements.

[0031] The membrane may have a membrane bottom with a top surface, and the support portion may be

have a support section underside. An axial height (or length) H_1 between an axial reference height and the underside of the support section is preferably less than or equal to an axial height (or length) H_2

between the (same) axial reference height and the Top side of the membrane base.

[0032] The diaphragm base is the section of the diaphragm that is essentially flat and perpendicular to the surface. This is the section that extends flat between the container wall and through which there are separate spaces above and below the membrane.

[0033] The top of the membrane base is the side (or surface) of the membrane facing the support structure.

[0034] The axial height between the top of the diaphragm base and the reference height is determined in the basic state of the diaphragm, whereby the above remarks on the basic state of the diaphragm are to be applied.

[0035] The height H_1 between an axial reference height and the underside of the support section is preferably less than 5 mm less than the height H_2 between the axial reference height and the upper side of the membrane base, more preferably the height H_1 is less than 3 mm less than the height H_2, even more preferably the height H_1 is less than 1 mm less than the height H_2, most preferably the height H_1 is less than 0.5 mm less than the height $H_{(2)}$.

[0036] In principle, the reference height or reference height can be

Any height or point can be used as a reference point, but it is preferable to use the axial height of the lid or the axial height of a container rim of the container as the reference height.

[0037] A force $F_{filling}$ acting on the diaphragm (or on the bottom of the diaphragm), which is caused, for example, by a filling process or an overpressure as described at the beginning of this **section.**

is preferably at least partially absorbed by the support section.

[0038] By absorbing part of the force acting on the membrane, the load in the fastening area is reduced. The force can, for example, be transferred from the support section to the support section and from this further to the lid or its connection to the container wall.

[0039] One on the membrane (or membrane base) force $F_{filling}$, which in turn can be caused by the filling process or by an overpressure, can be partially neutralised by the support section.

can be deflected in such a way that a force F_{Res} acts in the fastening area between the membrane collar and the section of the inside of the container, which has a greater shear component than a peel component.

[0040] Part of the force acting on the diaphragm As described above, $F_{filling}$ is absorbed by the connection between the lid and the container wall. **[0041]** By deflecting the force, a force acts in the fastening area that can be absorbed much better by a bond, for example, than the force that would act if the force $F_{filling}$ were not deflected. Without deflection, the force acting in the fastening area would be characterised by a peeling component, i.e. the peeling component would be greater. greater than the shear component. From the direction of a

force relative to the fastening area, their proportions can be broken down into the components described at the beginning (shearing component, peeling component).

[0042] Preferably, between the cover and the Membrane an object can be arranged.

[0043] Such an object can be, for example, a spoon or chopsticks.

[0044] The cover and the support structure can be designed in one piece.

[0045] The cover and the supporting structure are in in this case, the cover and the support structure can be manufactured as a unit (one-piece) or the cover and the support structure can be manufactured as individual parts and the insertion of the cover and the support structure can be made in one piece.

parts are connected to each other with a material bond (for example by welding). The support structure can include a predetermined breaking point. Preferably, the predetermined breaking point is arranged on a supporting element of the support structure If the support structure comprises several supporting elements, several predetermined breaking points can be arranged on the support structure.

breaking points can be arranged on the support structure. Preferably, there is one predetermined breaking point per support element.

[0046] A predetermined breaking point, particularly in conjunction with a one-piece design of the lid with the supporting structure, means that the supporting structure can be

cover with the supporting structure, the supporting structure can be separated from the cover when

a consumer removes the lid from the container for the first time. The consumer can then dispose of the support structure, as this is primarily used during the

packaging process and storage (before the membrane is removed).

[0047] Preferably, the distance between the predetermined breaking point and the cover is small. Especially smaller than 20 mm, smaller than 10 mm or smaller than 5 mm. A filled container can be made providing one of the containers shown here, the container having an opening facing the lid or provided at the end of the container.

the end that is closed with the lid

opposite the lid (also filling opening). A solid or liquid product can be placed in the opening opposite the lid or at the end of the container opposite the lid. In addition, the space in which the filling material was

has been or is to be introduced can be gassed with a gas (e.g. nitrogen). The opening through which the filling took place can then be closed.

[0048] The opening can be opened after filling, for example.

The connection can be closed by flanging with a piece of sheet metal.

[0049] As a result of the closure, the product lies in a space that is limited by the membrane, the container wall and the closure that closes the opening through which the product was filled.

through which the product was filled.

[0050] If an additional gas is introduced into the container during the filling process (solid or liquid),

For example nitrogen, an overpressure (compared to the environment) can prevail in the space into which the filling material has been introduced after the filling opening has been closed. The overpressure is preferably less than 500 mbar, more preferably less 350 mbar and especially a maximum of 200 mbar, in each case compared to the ambient pressure.

[0051] Containers described herein, the containers as containers closed on one side with a film membrane, can be filled by the method described below. For this purpose, a container as described is provided, wherein the container has an opening opposite the lid or the opening is present at the end of the container opposite the end closed by the lid (filling opening). The filling material is filled into the opening opposite the lid (filling opening), whereby the filling material falls onto the membrane (or the membrane base) and the support section of the support structure introduces or deflects the resulting force into the fastening area, whereby the force in the fastening area acts predominantly as a shear force.

[0052] The containers described can be used to hold or store a food product. In particular, the foodstuff is at least partially in powder form.

[0053] The embodiments of the invention are illustrated by way of examples and are not disclosed in such a way that limitations from the figures are transferred or read into the patent claims. The examples are to be read and understood as examples even if "e.g.", "in particular" or "e.g." not used everywhere and at every point. The explanation of one version is also not to be read as meaning that there are no others or that other possibilities are excluded if only one example is presented. These specifications are to be read into the entire following description.

Figure 1 shows the side of a container 1 in an axial sectional view.

Figure 2 schematically shows the section A-A from Figure 1 without showing the spoon 50 from Figure 1.

Figure 3 shows a supporting structure 20 in a perspective view.

Figure 3a shows a supporting structure 120 in a perspective view.

Figure 3b shows a supporting structure 220 in a perspective view.

Figure 3c shows a supporting structure 320 in a perspective view.

Figure 4 shows a detailed schematic illustration of the membrane 30 in the fastening area 33, formed by the fastening of the membrane frame 31 of the membrane 30 with the inner side of the membrane.
41 of the container wall 40.

Figure 5 shows a detailed sectional view of an upper section of a container 1.

Figure 6 shows a container 1 in an axial Sectional view.

[0054] Figure 1 shows a container 1 with a lid 10, a supporting structure 20, a membrane 30 and
of a container wall 40. The container 1 has at the bottom end (in the negative z-direction) a filling opening 60. The filling opening 60 is located at the end on the side of the container 1 opposite the lid 10.
food manufacturer or food packer can fill a food agent into the open space formed by the membrane 30 and the container wall 40.

[0055] During the filling of the product, the container 1 is typically rotated by 180 ° relative to the representation in Figure 1, so that the side of the
container 1 that ends with the filling opening 60 is at the top and the side of the container 1 that ends with the lid 10 is at the bottom. This allows a food manufacturer or food packer to drop or trickle or flow a filling product into the space that is accessible through the filling opening 60.
accessible through the filling opening 60 or allow it to trickle or flow in (filling). During the filling process, the weight of the filling product and the impact of the filling product on the membrane 30 (the filling product can be
from a considerable height) a force
$F_{filling}$ on the membrane 30, wherein the force $F_{filling}$ acts for the most part on the membrane base 32 of the membrane 30. [**0056**] The membrane 30 a membrane collar 31 which is connected to an inner side 41 of the container wall 40.
is connected. Typically, the diaphragm wheel has
31 has an axial extension or height (z-direction) of less than 20 mm, preferably less than 15 mm. [**0057**] Preferably, the connection of the membrane frame 31 to the inner side 41 of the container wall is fully
constantly circumferential, so that above and below the membrane 30 or the membrane base 31, there are two fluid-tight spaces separated from each other, whereby the spaces can be open.

[0058] The area (circumferentially and axially extending) in which the membrane collar 31 with the inner side
41 of the container wall 40 forms a fixing area 33.

[0059] Typically, the fastening of the membrane is by means of bonding or sealing, as well as
as described above. The fastener must be
The fastening area 33 does not fill the entire height of the axial extension of the membrane collar 31, but rather the axial height or extension of the fastening collar 31.
The axial extension of the fastening area 33 can be less than 15 mm, preferably less than 10 mm, particularly preferably less than 8 mm.

[0060] As discussed in detail above, the force would be $F_{filling}$, which acts on the diaphragm 30 due to the filling of the product, acts as a force with large peel components in the fastening area 33 that cannot be withstood favourably by a bond, for example. By arranging the support structure 20 in the container 1, the force acting on the membrane 30 during filling is minimised.
$F_{filling}$ is at least partially deflected so that a force acts in the fastening area 33 whose peel component is smaller than a peel component of the force acting in the fastening area of a container 1 without a support structure (under otherwise identical conditions). In addition, the force F_{fill} acting on the diaphragm 30 is partially transmitted by the support structure 20.

[0061] The support structure 20 comprises a support section 21 associated with the diaphragm 30 and a support section 22 associated with the cover 10. The force $F_{filling}$ acting on the diaphragm 30 is exerted by
the support section 21 and/or further guided
The membrane base 32 contacts the support section at least during the filling of the product and the support structure 20 is connected to the lid 10 via the support section 22.

[0062] In the embodiment of Figure 1, the support section 21 consists of a support outer ring 21a, whereby the support section 21 can comprise further elements in other embodiments.

[0063] By filling, the typically flexible membrane 30 can be deformed in the direction of the support section 21 of the support structure 20.

[0064] In Figure 1 , the lid 10 is designed as a snap-on lid and is fastened with a rolled edge 42, wherein the rolled edge 42 is formed at the upper end (in the positive z-direction) of the container wall 40. The support section 22 of the support structure 20 can transfer a force transferred from the support section 21 to the lid 10, whereby the transferred force can be absorbed by the fastening of the lid 10 with the rolled edge 42. The force deflection by the support section 21 is also made possible by the assignment of the support section 22 to the lid 10 and the fastening of the lid 10 with the rolled edge 42.

[0065] In Figure 1, the support section 22 comprises three supporting elements 23, 23', 23", whereby only two supporting elements 23, 23' are visible due to the sectional view. A perspective view of the supporting structure 20 with the supporting elements 23, 23', 23" can be found in Figure 3, which is described in detail below.

[0066] The supporting elements 23, 23', 23" are rod-shaped and each have a spherical section 24, 24', 24" at the upper end (in the positive z-direction), whereby, again due to the sectional view in Figure 1

only two spherical sections 24, 24' are visible.

[0067] Snap-on elements 11, 11', 11" are attached to the underside of the cover 10 (in the negative z-direction). of which only two snap elements are visible in Figure 1. 11, 11' are visible. The snap elements 11, 11', 11" are designed in such a way that at least the spherical sections 24, 24', 24" can snap into them, whereby a (detachable) connection of the supporting structure is achieved. 20 is provided with the lid 10.

[0068] The lid 10 closes a container opening 2 of the container 1, which is located (at the end) on the side of the container 1 opposite the filling opening 60. The container opening 2 typically serves to that a consumer can reach into the container 1, when the container is filled with a product and the filling opening 60 is closed (and the lid 10 is removed).

[0069] A consumer can open the filled container 1 by removing the lid 10, wherein the filling opening 60 is closed, the support structure 20 is removed from the space above the membrane 30 (in which the support structure 20 is arranged). Typically, the support structure 20 is a disposable article that is disposed of after removal by the user. disposed of after removal by the user. This is also because the function of the support structure 20 primarily comes into play during filling with a product, i.e. before a consumer can purchase the filled container.

[0070] In the space created by opening or removing of the lid 10 has become accessible (in which the support structure 20 is or was arranged), a spoon 50 is arranged in Figure 1. The consumer can reach through the container opening 2 and grab the spoon 50. long.

[0071] For example, the user can remove the membrane 30 or a section of the membrane 30 via a pull tab or a tear-off tab on the membrane 30, so that the filling material is accessible to the consumer. The filling material can be removed with the spoon 50 can be taken.

[0072] Instead of the spoon 50, an eating utensil can generally be arranged in the space above the membrane 30 (in the positive z-direction). There can also be other objects such as an advertising medium or a sachet (bag) of condiment.

[0073] The container opening 2 is preferably reclosable by the lid 10.

[0074] The cover 10 can be a press-in cover.

[0075] In Figure 1, between the support section 21 of the supporting structure 20 and the membrane collar 31 of the membrane 30. The length of the gap s in the radial direction (r direction) is preferably small, as shown above.

[0076] The diaphragm 30 can be in different axial height positions can be attached to the inside 41 of the container wall 40. Preferably, the distance of the diaphragm 30, determined by the axial height The height of the top position of the membrane base 32 to the upper end of the container 1 (in the positive z-direction) is less than 70 % of the total container height, particularly preferably less than 55 % of the total container height, even more preferably less than 40 % of the total container height, most preferably less than 30 % of the total container height.

[0077] Two or more than two membranes 30 can also be arranged at the different height positions described above.

[0078] Figure 2 schematically shows the section A-A from Figure 1, whereby the proportions of the elements shown in Figure 2 do not always correspond to those in Figure 1 and the spoon 50 from Figure 1 is not shown. In addition, the gap s from Figure 1 is equal to 0 (zero), so that the support section 21 (support outer ring 21a) of the support structure 20 lies radially against the membrane collar 31 of the membrane 30.

[0079] The membrane collar 31 is connected to the inside 41 of the container wall 40 (fluid-tight) in a completely surrounding manner. The support outer ring 21a of the support structure 20 is annular in shape.

[0080] Three supporting elements 23, 23', 23" are connected to the supporting outer ring 21a in a material-locking manner. As shown in Figure 1 and described for the third support element 23", the support elements 23, 23', 23" are to the lid 10 as components of the support section 22, so that a force acting on the support outer ring 21a (support section 21) via the membrane 30 can be partially absorbed by the connection of the lid 10 to the container wall 40 or, as in Figure 1, to the rolled edge 42.

[0081] In addition, the connection of the lid 10 to the container wall 40, as is the case when using a press-in lid, or the rolled edge 42 provides the counterforce or holding force that is necessary to enable a deflection of the force acting on the membrane 30 (or on the membrane base 32) into the fastening area 33 as a more favourably absorbable force with an increased shear component (reduced peel component).

[0082] The support elements 23, 23', 23" are arranged circumferentially evenly on the (circular) annular support outer ring 21a.

[0083] Support outer ring 21a can also be oval (with or without an axis of symmetry) or polygon-shaped. Preferably, the shape of the support outer ring 21a corresponds to the shape of the cross-section (perpendicular to the container longitudinal axis) of the container wall 41, in the section of the container wall 41 to which the membrane 30 is attached.

[0084] More than three support elements can arranged on the support section 21, for example on the support outer ring 21a. In particular, four, five or more than five support elements can be arranged on the support section 21. The same number of snap-on elements can be arranged on the cover 10 as the number of supporting elements. The more than three supporting elements are preferably evenly distributed around the circumference

arranged.

[0085] Two supporting elements are also possible. **[0086]** A supporting structure 20, as shown in Figure 1 and Figure 2, is shown in perspective in Figure 3, whereby the proportions of the elements shown in Figure 3 elements shown in Figure 3 do not always correspond to the proportions of the elements of the supporting structure in Figure 1 and Figure 2.

[0087] The support structure 20 in Figure 3 comprises an outer support ring 21a as the support section 20 and three support elements 23, 23', 23", which are connected to the support outer ring 21a are connected by a material bond. The outer support ring 21a has a rectangular cross-section.

[0088] The support elements 23, 23', 23" are rod-shaped and have a circular cross-section

The support elements 23, 23', 23" have a spherical end (upper section of the support elements 23, 23', 23").

[0089] Figure 3a shows a further embodiment of a support structure 120 with a support section 20 121 and a support section 122. 121 and a support section 122. The support section 121 comprises an outer support ring 121a, an inner support ring 128 and several support rods 127, 127', 127", 127‴, 127⁗, which are evenly distributed around the circumference. The inner support ring 128 is connected to the outer support ring 121a by the support rods 127, 127', 127", 127‴, 127⁗.

[0090] This configuration of the support section 121 of the support structure 120 allows a membrane 30 are supported over a large area. This means that forces such as 30 (membrane base 32) described above are transferred to a greater extent to the connection of the lid 10 with the container wall 40 or the rolling edge 42 than is the case with the supporting elements. construction 20 in Figure 3 is the case.

[0091] This embodiment further comprises supporting elements 123, 123', 123" with spherical upper Sections 124, 124', 124", which are analogous to the supporting elements 23, 23', 23" with upper spherical sections 24, 24', 24" of the embodiment in Figure 3.

[0092] Figure 3b shows an embodiment of a support structure 220 with a support section 221 and a support section 222. The support section 221 comprises a support outer ring 221a, a support inner ring 221a, a support outer ring 221b and a support inner ring 221b. ring 228 and several support rods 227, 227', 227", 227‴, 227⁗. The support section 221 of this embodiment is analogous to the support section 121 in Figure 3a.

[0093] The support section 222 comprises three support members 223, 223', 223", which are connected to the support outer ring 221a and a support ring 229. The support ring 229 is (circular) annular in shape and a rectangular cross-section. The snap element or snap elements of the lid 10 are adapted accordingly so that the support ring 229 can snap into one or more snap elements of the lid 10. cover 10 is possible. The support ring 229 can also have a circular cross-section.

[0094] Preferably, the support ring 229 has the same diameter as the outer support ring 221a. The support ring 229 and the support outer ring each a plane, whereby the planes can be parallel. **[0095]** Figure 3c shows a further embodiment of a support structure 320 with a support section 321 and a support section 322. The support section 321 comprises a support outer ring 321a. The support section 322 comprises three support elements 323, 323', 323", which are connected to the support outer ring 321a and a support ring 329. The support section 322 is designed in the same way as the support section 222 in Figure 3c.

[0096] Preferably, the support elements 23, 23' have the following features, 23"; 123, 123', 123"; 223, 223', 223"; 323, 323', 323" one Length (extension in the longitudinal axis of the container) of maximum 100 mm, preferably maximum 80 mm, even more preferably maximum 50 mm.

[0097] Figure 4 shows, by means of a detailed view of a section showing a connection of the membrane 30 to the container wall 40, how a force deflection can be implemented by a supporting structure 20. **[0098]** During the filling of a filling material into the filling opening 60 of a container 1 (cf. Figure 1), the filling material can impinge on the membrane base 32, where acts on the diaphragm 30 by a force F_{fill}. The Membrane 30 is to the inside 41 of the container wall 40 via a membrane collar 31. In the embodiment shown in Figure 4, the connection is designed as adhesive bond, with an adhesive layer being surrounded by the fastening area 33.

[0099] The support structure 20 is arranged on the side of the diaphragm 30 opposite the (later) introduced filling material, with the support section 21 resting against the diaphragm base 32. The support structure 20 allows the force $F_{filling}$ acting on the membrane 30 (membrane base 32) to be transferred to the fastening area. area 33 in such a way that a resultant force F_{Res} acts. The resulting force F_{Res} in the fastening area 33 must be able to be absorbed in such a way that no damage to the connection between the membrane collar 31 and the inside 41 of the container wall 40 jeopardises the tightness of the connection. When bonding The resulting force F_{Res} is compensated by a force $F_{Adhesive}$ provided by the bonding in Figure 4 and can be absorbed accordingly.

[0100] Due to the deflection, the shear component (force effect parallel to the fastening area 33) of the resulting force F_{Res} is greater than the shear compo- The force that would act in the fastening area if the support structure 20 not used. For a clearer representation the force F_{Res} shown in Figure 4 is only a shear component, whereas in reality there is also a shear component. peel component can occur, which would mean that the resulting force F_{Res} is not parallel to the fastening area.

[0101] Even if the force deflection does not result in a force that only has a shear component,

the increase in the shear component means that the requirement for the quality of the bond is reduced or, with the same quality of bond, a better seal can be guaranteed.

[0102] Figure 5 shows a container 1 with a lid 10, a supporting structure 20 and a membrane 30. The membrane 30 is in the basic state described above. The membrane 30 comprises a membrane base 32 with a membrane base upper side 35 and a membrane collar 31.

The support structure 20 comprises a support section 21 with a support section underside 25.

[0103] Between the underside of the cover 12, as a reference point, and the underside of the support section 25, an axial (in the z-direction) distance H(1) (also length or height) is formed.

axial (in z-direction) distance H_1 (also length or height) is formed. Between the underside of the lid 12, as the reference point, and the upper side of the membrane base 35 is in axial (z-direction) distance H_2 (also length or height). The length H_1 in Figure 5 is smaller than the Length H_2.

[0104] As a result, no pressure is exerted on the diaphragm base 32 of the diaphragm 30 when the diaphragm 30 in the basic state. If a force is applied in z-direction is exerted on the diaphragm base 32.

, the diaphragm base 32 can deform in the direction of the underside of the support section 25, whereby the pressure exerted on the diaphragm base 32 is reduced.
force acting on the diaphragm base 32 is deflected and/or transmitted by the support structure 20.
can.

[0105] In general, the filling material to be introduced or introduced into the container 1 in the space below the membrane 30 can be a foodstuff, in particular a powdered foodstuff. The space below the Membrane 30 is the space that is covered on at least one side by the membrane 30, but does not include the support structure 20.

[0106] The shielding gas preferably comprises nitrogen, in particular the shielding gas comprises nitrogen with a concentration of over 80% by volume (proportionate to the composition of the total shielding gas).
composition of the entire shielding gas).

[0107] Figure 6 shows a container 1 which is similar to the container of Figure 1, wherein the support structure 20 is integrally or integrally formed with the lid of the container. 10 is designed. The cover 10 is firmly attached to the support structure 20, in particular the support elements 23, 23', 23" (support element 23" is not shown due to the sectional view).

[0108] In this embodiment, a predetermined breaking point 71, 71', 71" is provided on one of the support elements 23, 23', 23", whereby the predetermined breaking point 71" on the supporting element 23" is not visible due to the sectional view. The predetermined breaking points 71, 71', 71" are designed as a slot in the support elements 23, 23', 23" in the illustration of Figure 6, whereby the slot The material is weakened against mechanical stress compared to unslotted support elements 23, 23', 23".

[0109] At the positions of the predetermined breaking points of the support elements 23, 23', 23", a separation of the support structure 20 from the lid 10 is to be expected if a consumer opens the lid 10 and, during opening, removes the lid 10 from the container 1 with a sufficiently large force and deviation from an exclusively axial removal, so that the support section 21 rests against the inner side 41 of the container wall 40.

[0110] Predetermined breaking points can also be designed as cross-sectional tapering in supporting elements or by using a section in the supporting elements with a material that is less mechanically resistant than the material of the remaining sections of supporting elements.

[0111] Otherwise, the container of the embodiment of Figure 6 corresponds to the embodiment of Figure 1 and the disclosure of the embodiment of the figure is valid for the embodiment of Figure 1.

[0112] Any of the disclosed support structures can be used for the container 1 of Figure 6.

P A T E N T K R A V

1. Beholder med en beholdervæg (40), en beholderåbning (2), et låg (10), en membran (30) og en støttekonstruktion (20), hvor

(a) låget (10) lukker beholderåbningen (2);

(b) et afsnit af en membrankrave (31) på membranen (30) er fastgjort til et afsnit af en inderside (41) af beholdervæggen (40), således at et fastgørelsesområde (33) dannes;

(c) støttekonstruktionen (20) omfatter et støtteafsnit (21) og et bæreafsnit (22), hvor støtteafsnittet (21) er tildelt membranen (30), og bæreafsnittet (22) er tildelt låget (10);

kendetegnet ved, at

(d) bæreafsnittet (22) omfatter et bæreelement (23), som er stavformet (23, 23', 23") udformet, og at der er en spalte (s) mellem støtteafsnittet (21) og membrankraven (31) på membranen (30).

2. Beholder ifølge krav 1, hvor støtteafsnittet (21) er i kontakt med eller ikke i kontakt med membranen (30), eller hvor støtteafsnittet (21) er i kontakt med membranen (30) på en sådan måde, at en kraft udøves fra støtteafsnittet (21) på membranen (30).

3. Beholder ifølge krav 1, hvor spalten s har en længde på mindre end 20 mm, fortrinsvis mindre end 10 mm, mere fortrinsvis mindre end 5 mm, mest fortrinsvis mindre end 2 mm.

4. Beholder ifølge et hvilket som helst af kravene 1 til 3, hvor støtteafsnittet (21) er ringformet udformet;

og/eller

hvor støtteafsnittet (21) er stofligt forbundet med bæreafsnittet (22);

og/eller

hvor bæreafsnittet (22) er forbundet med låget (10).

5. Beholder ifølge et hvilket som helst af kravene 1 til 4, hvor bæreafsnittet (22) omfatter tre bæreelementer (23, 23', 23"), som er stavformet udformet.

6. Beholder ifølge krav 5, hvor låget (10) omfatter et snappeelement (11), hvori en øvre del (24) af bæreelementet (23) er snappet fast, fortrinsvis hver en øvre del (24, 24', 24") af tre bæreelementer (23, 23', 23") er snappet fast i ét snappeelement (11) eller i tre snappeelementer (11, 11', 11").

7. Beholder ifølge et hvilket som helst af kravene 1 til 6, hvor membranen (30) har en membranbund (32) med en overside (35), og støtteafsnittet (21) har en underside (25), hvorved en aksial højde (H1) mellem en aksial referencehøjde (R) og undersiden (25) af støtteafsnittet (21) er mindre end eller lig med en aksial højde (H2) mellem den aksiale referencehøjde (R) og oversiden (35) af membranbunden (32).

8. Beholder ifølge krav 7, hvor højden (H1) er mindre end 5 mm mindre end højden (H2), fortrinsvis hvor højden (H1) er mindre end 3 mm mindre end højden (H2), mere fortrinsvis mindre end 1 mm, mest fortrinsvis mindre end 0,5 mm.

9. Beholder ifølge et hvilket som helst af kravene 7 eller 8, hvor den aksiale referencehøjde (R) svarer til den aksiale højde på låget (10) eller til den aksiale højde af en beholderkant (42) på beholderen.

10. Beholder ifølge et hvilket som helst af kravene 1 til 9, hvor en på membranen (30) virkende aksial kraft (F_{Fyld}) helt eller delvist kan optages af støtteafsnittet (21);

og/eller

hvor en på membranen (30) virkende aksial kraft (F_{Fyld}) kan omdirigeres af støtteafsnittet (21) således, at der i fastgørelsesområdet (33) mellem membrankraven (31) og afsnittet af indersiden (41) af beholderen (40) virker en kraft (F_{Res}), som har en større forskydningskomponent end en afskrælningskomponent;

og/eller

hvor der er anbragt en genstand mellem låget (10) og membranen (30), især en ske eller spisepind;

og/eller

hvor låget (10) og støttekonstruktionen (20) er udformet som én samlet enhed.

11. Beholder ifølge et hvilket som helst af kravene 1 til 10, hvor støttekonstruktionen (20), især et bæreelement (23) af støttekonstruktionen (20), omfatter en forudbestemt brudlinje (71, 71').

12. Beholder ifølge krav 11, hvor en afstand mellem låget (10) og brudlinjen (71, 71') er mindre end 20 mm, fortrinsvis mindre end 10 mm, mere fortrinsvis mindre end 5 mm.

13. Fremgangsmåde til påfyldning af en beholder, der er lukket på den ene side med en foliemembran, omfattende trinnene:

(a) At tilvejebringe en beholder ifølge et hvilket som helst af kravene 1 til 12, hvor beholderen har en åbning modsat låget;

(b) At påfylde et fyldstof i den åbning, der er modsat låget, hvorved fyldstoffet falder ned på membranen (30), og hvor støtteafsnittet (21) i støttekonstruktionen (20) hovedsagelig leder den opståede kraft ind i fastgørelsesområdet (33) som forskydningskraft eller leder den derhen.

14. Anvendelse af en beholder ifølge et hvilket som helst af kravene 1 til 12 til opbevaring af en fødevare, især en i det mindste delvist pulverformet eller kornet fødevare.

FIG. 1

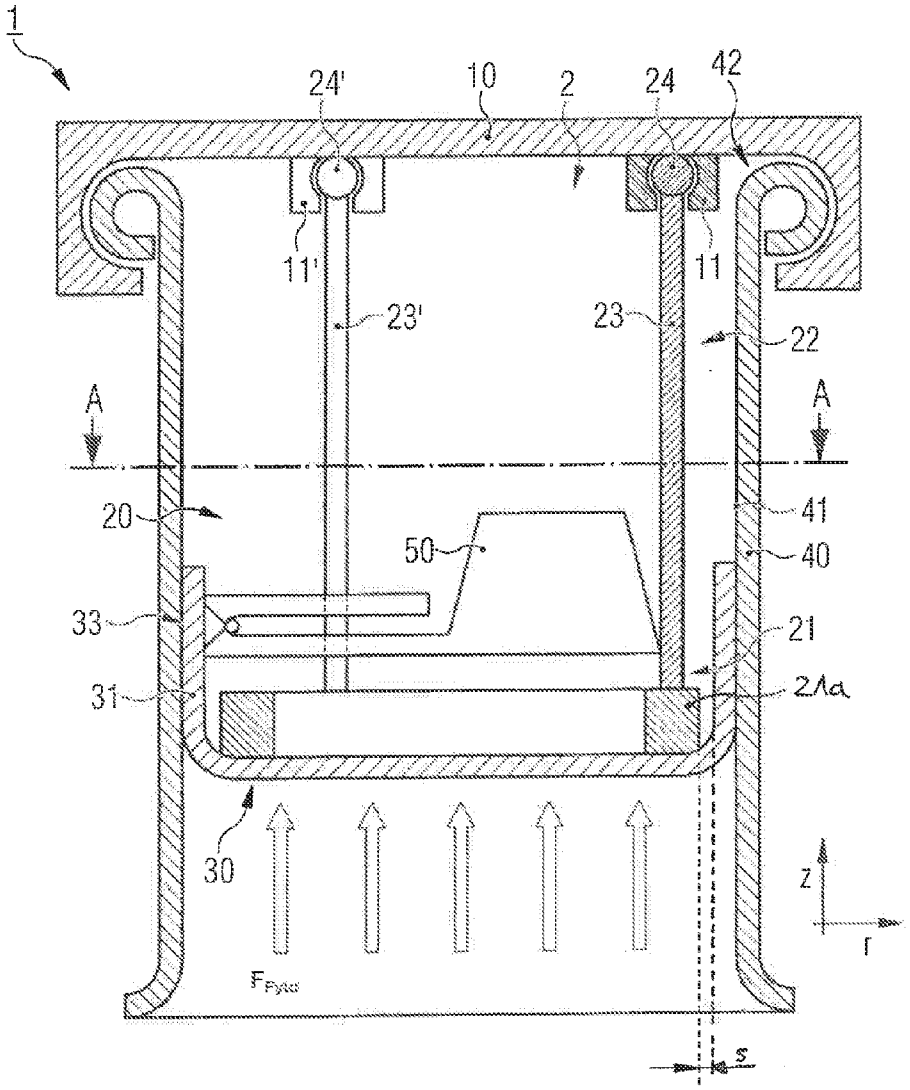

FIG. 2

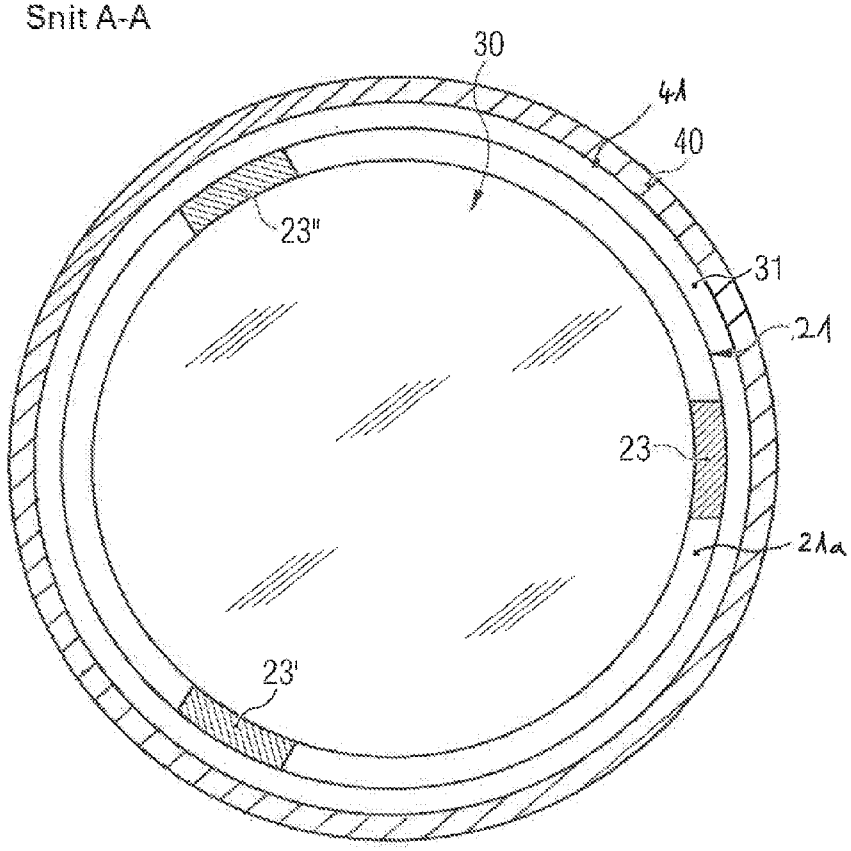

FIG. 3

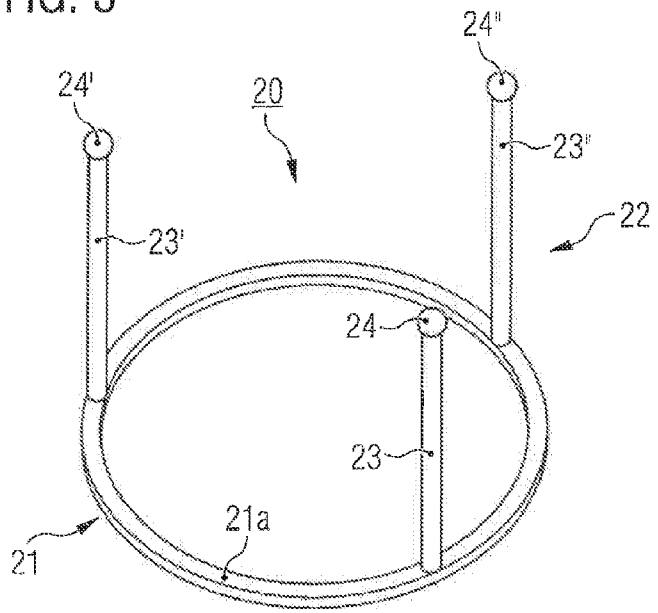
24''
24'
20
23''
22
23'
24
23
21a
21

FIG. 3a

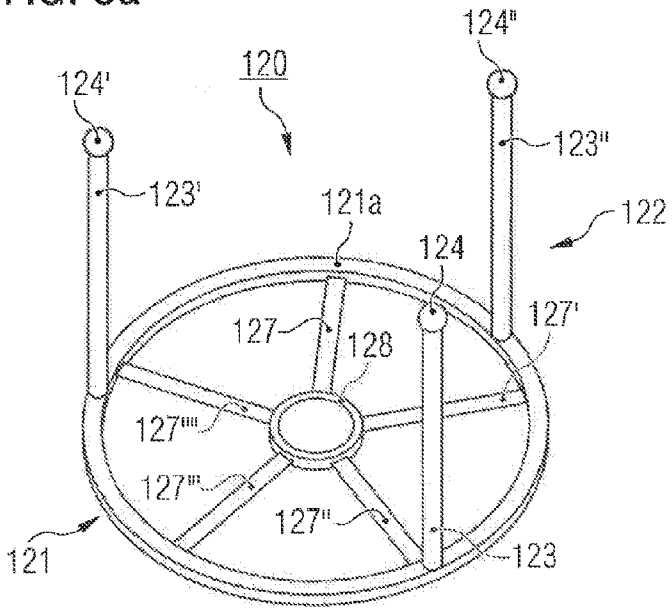
124''
120
124'
123''
123'
121a
122
124
127'
127
128
127''''
127'''
127''
123
121

FIG. 3b

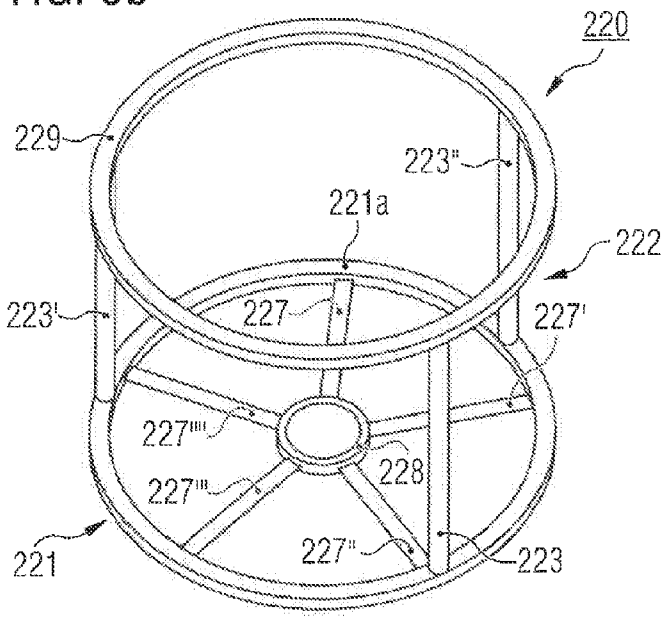
220
229
223''
221a
222
223'
227
227'
227'''
228
227''
221
227''
223

FIG. 3c

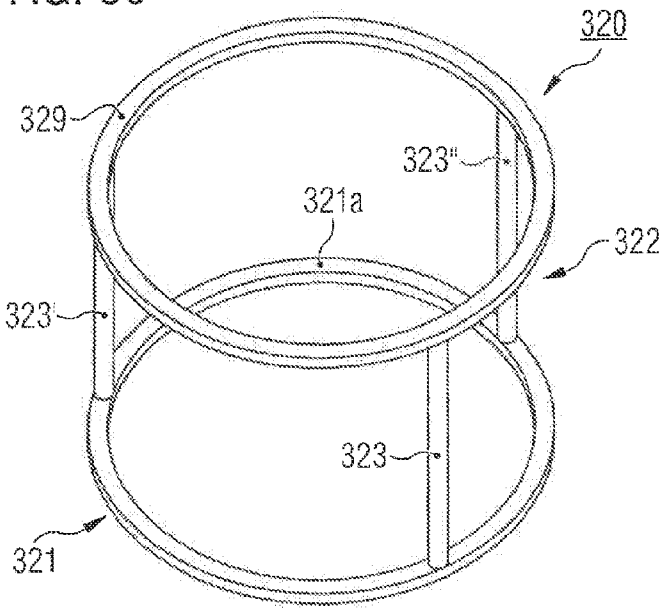
320
329
323''
321a
322
323'
323
321

FIG. 4

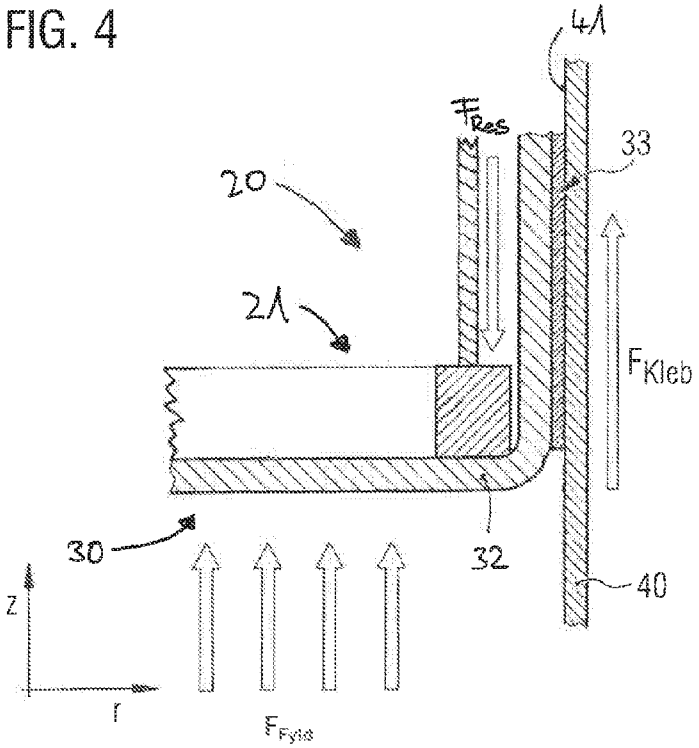
41
33
20
21
F_{Res}
F_{Kleb}
30
32
40
z
r
F_{Fixit}

FIG. 5

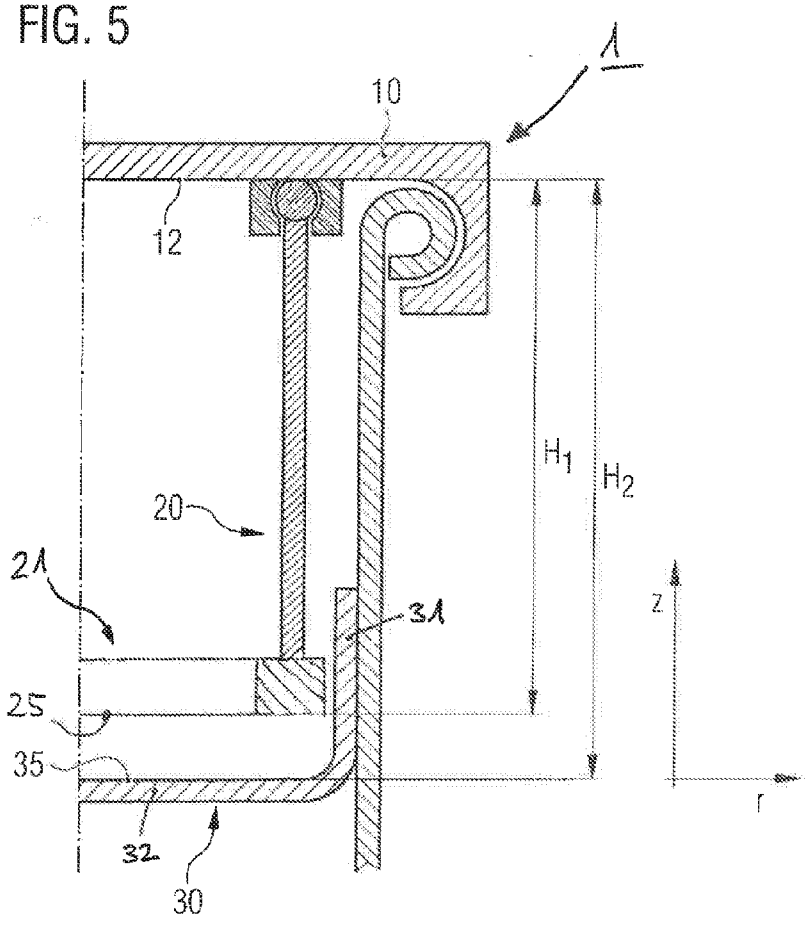
1
10
12
H_1
H_2
20
21
31
25
35
32
30
z
r

FIG. 6