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(54) **A PACKAGE CLOSURE AND A DEVICE AND A METHOD FOR PRODUCING A PACKAGE CLOSURE**

PAKETVERSCHLUSS SOWIE VORRICHTUNG UND VERFAHREN ZUR HERSTELLUNG DES
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Description

FIELD OF THE INVENTION

[0001] The invention relates to a package closure and a device and a method for producing a package closure. This type of package closures comprise a neck having an opening and a cap extending across the opening for closing thereof. Package closures of this type are arranged in plastic materials and have an inherent flexibility, such as thermoplastic materials or other plastic materials having similar properties. Package closures of this type are generally used for packages for liquid foodstuff, such as milk, juice, water, yoghurt and similar but can be used for any type of package.

PRIOR ART

[0002] There are a plurality of different types of package closures in the prior art. One such type of device is for example disclosed in WO2009136836. The package closure disclosed in WO2009136836 comprises a neck provided with an external thread, and a screw cap being connectable with the neck through the thread of the neck. The neck is arranged with a connecting portion for connection to a package, and a sealing lip projecting from the connecting portion in an angle to interact with the cap to form a seal between them. The cap is provided with a sealing part projecting from an interior side of the cap for interaction with the sealing lip of the neck, so that the package closure can be resealed.

[0003] One problem with such package closures of prior art is that they are complex and expensive to produce and consequently require expensive and advanced equipment for production thereof. The production requires at least two moulding tools, i.e. one for the cap and one for the neck, wherein the cap, in addition, must be mounted on the neck. Hence, a plurality of production steps is required to produce such prior art package closures.

[0004] One drawback of such prior art package closures is that they require a considerable amount of material. A screw cap requires a considerable rigidity of both cap and neck, which results in extensive material consumption.

[0005] US 6 192 569 discloses another example of a closure.

SUMMARY OF THE INVENTION

[0006] An object of the present invention is to avoid the drawbacks and problems of the prior art. The package closure according to the invention results in considerable material savings and a simplified production process in which the entire package closure can be produced in a single step in a single tool without subsequent mounting of different parts of the package closure, while the package closure according to the invention results in a tight,

tamper proof and resealable package closure.

[0007] The present invention relates to a package closure according to claim 1. The notch arranged between the cap and the sealing portion combined with the sealing part of the cap interacting with the sealing portion result in considerable material savings as the package closure can be obtained without screw cap or similar. Further, the package closure can be produced in a single tool in a single production step, which results in an energy-saving, environmentally friendly, simple and cost efficient production. The notch results in a tamper proof package closure and the sealing portion in combination with the sealing part of the cap provide a tight and resealable package closure.

[0008] The package closure can be arranged in a flexible and resilient plastic material, wherein the flexibility can be adjusted, for example, by means of determining the material thickness.

[0009] An interior side of the cap can be provided with a flange for interaction with a tool core in a device for producing the package closure, so that the cap is connected to the tool core during the production thereof. By the flange the cap can be connected to and retained at the tool core temporarily. At the same time the sealing portion can be arranged flexible and bendable in relation to the connecting portion, so that the connecting portion is displaceable in relation to the cap during bending of the sealing portion and folding along the notch when the cap is connected to the tool core through the flange. The flange can be arranged on the sealing part. Alternatively, the flange can be arranged on a projection connected to the cap, which then can be more rigid than the sealing portion. Hence, production of the cap and the neck in one piece, i.e. as one integrated unit, is facilitated to provide a resealable package closure having a tear notch. The sealing portion and the sealing part can interact through a snap-lock function to facilitate resealing of the cap.

[0010] The cap can be connected to the neck through a hinge portion, so that the cap can be pivoted around the hinge portion, and wherein a portion of the cap and the neck interact through a snap-lock function, so that the cap can be fastened to the neck in its open position. Hence, a hinged cap can be maintained in its open position during emptying of the package, so that the cap not unintentionally obstruct or interfere with the emptying.

[0011] The invention also relates to a device according to claim 11.

[0012] The invention also relates to a method according to claim 14.

[0013] Further characteristics and advantages of the present invention will become apparent from the description of the embodiments below, the appended drawings and the dependent claims.

SHORT DESCRIPTION OF THE DRAWINGS

[0014] The invention will now be described more in detail with the aid of embodiments and with reference to

the appended drawings, in which

Fig. 1 is a schematic view, partly in section, of a package closure and a part of a device for producing the package closure according to one embodiment of the present invention, in which the device is in a position for moulding the package closure,

Fig. 2 is a schematic view according to Fig. 1, in which the device is in a position for ejecting a produced package closure,

Fig. 3 is a schematic cross section view of the package closure and a part of the device according to Fig. 1,

Figs. 4-8 is a series of schematic cross section views of a part of the device and the package closure according to one embodiment of the invention, illustrating a part of the method for producing the package closure,

Figs. 9-13 is a series of schematic cross section views of a part of the package closure according to one embodiment of the invention, illustrating opening and resealing of a cap of the package closure,

Fig. 14 is a schematic perspective view of a part of the package closure according to one embodiment of the invention, in which a cap of the package closure is illustrated in a half open position,

Fig. 15 is a schematic perspective view according to Fig. 14, wherein the cap is illustrated in a fully open position in which the cap interacts with a neck of the package closure by a snap-lock function for holding the cap in the open position,

Fig. 16 is a schematic section view of a package closure according to one embodiment of the invention, in which the package closure is provided with an exterior fastening device illustrated in its unlocked position before finishing the package closure,

Fig. 17 is a schematic section view according to Fig. 16, in which the package closure is finished and the fastening device is in a locked position,

Fig. 18 is a schematic section view of the package closure and a part of the device for producing it according to one embodiment,

Figs. 19-23 is a series of schematic section views of a part of the device and the package closure according to one embodiment of the invention, illustrating a part of the method for producing the package closure,

Fig. 24 is a schematic section view of the package closure according to one embodiment of the invention connected to a package,

Fig. 25 is a schematic perspective view seen obliquely from above of a package closure in a closed position according to one embodiment of the invention, and

Fig. 26 is a schematic view seen obliquely from above of the package closure in Fig. 25 in its open position.

THE INVENTION

[0015] Referring to Fig. 1 a package closure 10 and a part of a device for producing said package closure 10 is illustrated schematically. The package closure 10 is arranged in a flexible material, such as a suitable plastic material. For example, the package closure 10 is formed in a suitable thermoplastic, such as polyethylene. The device comprises a movable first jaw 11, a movable second jaw 12, a counterpart 13 and a tool core 14 interacting with the jaws 11, 12 and the counterpart 13 to form a mould for receiving an amount of plastic material for producing the package closure 10. The device further comprises a movable ejector 15 for ejecting the produced package closure 10, which is described in more detail below. The device is arranged as a moulding tool for moulding plastic materials. For example, the device is arranged for moulding plastic materials, wherein the jaws 11, 12 and/or the tool core 14 can be heated and/or cooled in a conventional manner. The jaws 11, 12 and the tool core 14 is arranged with a particular form for providing the mould for producing the package closure 10 according to the invention, which form is evident by the description of the features of the package closure 10 below.

[0016] In the embodiment of Fig. 1 the tool core 14 comprises an outer tool core 16 and an inner tool core 17 being movable in relation to the outer tool core 16. Hence, the inner tool core 17 is displaceable in the axial direction in relation to the inner tool core 16. For example, the outer tool core 17 is fixed.

[0017] In Fig. 1 the device is illustrated in a position in which the jaws 11, 12 interact with the counterpart 13 and the tool core 14 to form the mould for moulding the package closure 10 and in which a package closure 10 is in the mould, i.e. in contact with the jaws 11, 12, the counterpart 13 and the tool core 14.

[0018] With reference to Fig. 2 the device is illustrated in a position for ejecting a produced package closure 10. In the position of Fig. 2 the jaws 11, 12 and the counterpart 13 are disengaged from the package closure 10. Hence, the jaws 11, 12 are movable in a direction substantially perpendicular to a centre axis X of the package closure 10, which direction is illustrated by means of the arrow A in Fig. 2, between the position illustrated in Fig. 1 and

the position illustrated in Fig. 2. The counterpart 13 is further movable in a direction along the centre axis X of the package closure 10, as illustrated by means of the arrow B in Fig. 2, between the position illustrated in Fig. 1 and the position illustrated in Fig. 2. When the jaws 11, 12 and the counterpart 13 are disengaged from the package closure 10 the package closure 10 can, by means of the ejector 15, be ejected forward axially in a direction along the centre axis X of the package closure 10, as illustrated by means of the arrow C in Fig. 2.

[0019] With reference to Fig. 3 the package closure and a part of the device are illustrated more in detail. In Fig. 3 an upper portion of the outer tool core 16 has been removed to show the arrangement of the package closure more clearly.

[0020] In the illustrated embodiment the package closure 10 is substantially cylindrical having a circular cross section. Alternatively, the cross section of the package closure 10 is elliptic, triangular, rectangular or arranged with any other shape, with or without rounded corners. The package closure 10 comprises a neck 18 with an opening, and a cap 19 extending perpendicular to the opening for closing thereof. For example, the cap 19 extends substantially radially. The neck 18 comprises a connecting portion 20 for connection with a package, and a sealing portion 21 projecting in an angle from the connecting portion 20. For example, the connecting portion 20 extends substantially axially. In the illustrated embodiment the connecting portion 20 is arranged with an angled portion 22 arranged in an angle to the connecting portion 20 to facilitate connection to a package. For example, the angular portion 22 projects substantially radially in relation to the connecting portion 20.

[0021] The sealing portion 21 is arranged thinner than the connecting portion 20 and projects inwards in relation to the connecting portion 20. The sealing portion 21 is terminated with a tapered portion forming a notch 23 connecting to the cap 19. Hence, the sealing portion 21 is connected to the cap 19 in one end when the cap 19 not has been opened and the notch 23 is intact. Hence, the outer tool core 16 is arranged to interact with the jaws 11, 12 to form the connecting portion 20 and the sealing portion 21 of the neck 18, and the notch 23 between the neck 18 and the cap 19.

[0022] The cap 19 is provided with a sealing part 24 projecting from an interior side of the cap 19, and a projection 25 projecting from the interior side of the cap 19. For example, the sealing part 24 and the projection 25 extend substantially axially and in parallel to each other. The sealing part 24 is arranged between a peripheral edge of the cap 19 and the projection 25, wherein the projection 25 is arranged between the centre axis X and the sealing part 24 and thus more centrally than the sealing part 24. The sealing part 24 is further connected to the sealing portion 21 of the neck 18 through the notch 23 when the notch 23 not has been broken. The projection 25 is flexible and arranged for interaction with the inner tool core 17, so that the cap 19 is connected to the

inner tool core 17 through the projection 25 during the production of the package closure 10.

[0023] With reference to Figs. 4-8 a part of the production of the package closure 10 is illustrated according to one embodiment of the invention. The outer tool core 16 has been removed from Figs. 4-8. In Figs. 4-8 an ejection process is illustrated schematically in which a moulded package closure 10 is ejected from the device during finishing thereof. In Fig. 4 the ejector 15 and the inner tool core 17 are illustrated in a position for moulding the package closure 10.

[0024] As evident from Fig. 4 the sealing portion 21 of the neck 18 is provided with a locking means 26 for interaction with a locking element 27 of the sealing part 24 of the cap 19 to form a snap-lock function, which is described more in detail below. In the illustrated embodiment the locking means 26 is arranged as a bulge, wherein the locking element 27 is arranged as a recess. For example, the recess is arranged substantially radially inwards towards the projection 25 and the centre axis X. Alternatively, the locking means 26 is arranged as a recess, wherein the locking element 27 is arranged as a bulge. The snap-lock function is provided by the inherent flexibility of the package closure 10 and, for example, the flexibility of the sealing portion 21. For example, the sealing portion 21 is inclined inwards in relation to the connecting portion 20.

[0025] The package closure 10 according to the invention is, for example, moulded in one piece, wherein the cap 19 and the neck 18 is a single integrated unit. The jaws 11, 12 and the tool core 14 form a continuous mould for moulding the neck 18 and the cap 19 in one continuous piece.

[0026] After moulding the package closure 10, when the material in the package closure 10 still is soft and not yet entirely has solidified or crystallized, both the ejector 15 and the inner tool core 17 is brought axially forward, as illustrated by means of the arrows D and E in Fig. 4, while bringing along the package closure 10 in the same direction, so that the cap 19, the sealing portion 21 and at least a part of the connecting portion 20 is disengaged from the outer tool core 16. Hence, the inner tool core 17 and the ejector 15 are displaceable in the axial direction in relation to the outer tool core 16. Alternatively, the outer tool core 16 is pulled backwards in relation to the ejector 15, the inner tool core 17 and the package closure 10. Then, the ejector 15 is displaced axially forward, as illustrated by means of the arrow F in Fig. 5, in relation to the inner tool core 17 while the inner tool core 17 interacts with the projection 25 to hold back the cap 19, so that the neck 18, by means of the ejector 15, is displaced in relation to the cap 19 for bending the sealing portion 21 and folding along the notch 23. Hence, the ejector 15 is displaceable in the axial direction in relation also to the inner tool core 17. The ejector 15 is displaced in relation to the cap 19 for folding the sealing portion 21 inwards, so called negative folding of the sealing portion 21, so that the sealing portion 21 is folded inwards and down-

wards towards the connecting portion 20. Hence, the sealing portion 21 is bent in relation to the connecting portion 20 of the neck 18 while the sealing portion 21 is folded in relation to the sealing part 24 of the cap 19 along the notch 23, so that the sealing portion 21 and the sealing part 24 are folded within the neck 18 or the connecting portion 20. To hold back the cap 19 temporarily the inner tool core 17 is, according to the illustrated embodiment, provided with a recess 28 for receiving the projection 25 or a flange 29 of the projection projecting radially inwards. Hence, the projection 25 is more rigid than the sealing portion 21 and the notch 23, wherein the sealing portion 21 and the notch 23 is folded instead of the projection 25 when the ejector 15 is displaced axially. The connecting portion 20 is pushed up towards the cap 19 while the sealing portion 21 is folded inwards and downwards, so that the sealing portion 21 is brought into contact with the sealing part 24, as illustrated in Fig. 6. Hence, the sealing portion 21 is folded to a position in which it extends substantially axially downwards or obliquely downwards and inwards for interaction with the sealing part 24 while the notch 23 connects the sealing portion 21 and the sealing part 24. The sealing portion 21 is folded towards the connecting portion 20 of the neck 18, so that the sealing portion 21 and the sealing part 24 are arranged between the connecting portion 20 and the centre axis X, i.e. within the connecting portion 20 of the neck 18. For example, the sealing portion 21 is folded to a position in which the locking means 26 interacts with the locking element 27. Then, the ejector 15 is brought further forwards in the axial direction while bringing along the package closure in the same direction, as illustrated by means of the arrow G in Fig. 7, so that the projection 25 is disengaged from the inner tool core 17 through its inherent flexibility and can leave the device for producing the package closure 10. For example, the projection 25 returns to its original position by its flexibility, as illustrated in Fig. 8.

[0027] The ejection of the package closure is, for example, performed within one or a few seconds after moulding thereof, wherein the temperature of the material in the package closure 10 is above room temperature and, for example, above 40°C or about 60°C, so that the material is semi liquid during the ejection.

[0028] For example, the cap 19 comprises a peripheral portion 30 extending radially outside the sealing part 24 for abutment against a radially extending connection portion 31, through which connection portion 31 the sealing portion 21 is connected to the connecting portion 20, when the package closure 10 has been produced and the cap 19 is closed.

[0029] With reference to Fig. 9 the package closure 10 is illustrated according to one embodiment of the invention in which the package closure 10 is connected to a package 32 and is unopened, wherein the notch 23 is intact. During opening of the cap 19 the sealing portion 21 will be folded somewhat upwards in a direction away from the sealing portion 20, as illustrated in Fig. 9 and

Fig. 10, after which the notch 23 is broken, as illustrated in Fig. 11, until the cap 19 can be opened, as illustrated in Fig. 12. For example, the cap 19 is connected to the neck 18 through a hinge portion to form a hinge function, so that the cap 19 can be opened and closed. Alternatively, the cap 19 can be entirely disengaged from the neck 18.

[0030] In Fig. 12 the cap 19 is illustrated in the open position in which the cap 19 has been opened or removed from the neck 18. When the cap 19 is in its open position the sealing portion 21 extends obliquely downwards and inwards, so that the sealing portion 21 is arranged within the connecting portion 20 of the neck 18 and a free end of the sealing portion 21 points away from the cap 19 towards an opening of the package to interact with the package closure 10. When the cap 19 is in its open position the sealing portion 21 is disengaged from the cap 19 and the sealing part 24 and is not affected by the cap 19 or the sealing part 24. The sealing portion 21 is folded negatively and is inclined inwards towards the centre axis X, so that the free end of the sealing portion 21 is arranged at a distance S from the interior side of the connecting portion 20 of the neck 18 when the sealing portion 21 is not affected by the sealing part 24. More specifically, an inner side of the free end of the sealing portion 21, directed towards the centre axis X, is arranged at the distance S from the interior side of the connecting portion 20 of the neck 18. For example, an angle between the sealing portion 21 and the connecting portion 20 of the neck 18 is less than 90°, for example 5°-45°, 10°-30° and for example, about 15°.

[0031] In Fig. 13 the cap 19 is illustrated in closed position. During closing of the cap 19 the sealing part 24 and the sealing portion 21 interact to form a snap-lock function, wherein the cap 19 is resealable. For example, the sealing portion 21 is arranged with a flexibility allowing for a radial displacement in relation to the sealing part 24 during closing of the cap 19, so that the sealing portion 21 is pushed somewhat to the side radially outwards by interaction with the sealing part 24, so that the sealing portion 21 is pushed against the sealing part 24 to form a sealing when the cap 19 is closed. Hence, the sealing portion 21 is pushed radially outwards in a direction away from the centre axis X and in a direction towards the connecting portion 20 of the neck 18 when interacting with the sealing part 24, so that the free end of the sealing portion 21 is positioned at a distance from the connecting portion 20 of the neck 18 which is smaller than the distance S. Hence, the sealing portion 21 pushes against the sealing part 24 by means of the inherent flexibility of the material to form a bias or sealing force towards the sealing part 24. An outer side of the sealing part 24 is arranged at a distance T from the inner side of the connecting portion 20 of the neck 18 when the cap 19 is closed. The distance T is smaller than the distance S. Hence, the length of the sealing portion 21 is larger than the distance T, wherein the length and angle of the sealing portion 21 are coordinated with the distance T be-

tween the inner side of the connecting portion 20 of the neck 18 and the sealing part 24, so that an inner side of the sealing portion 21 abuts against an outer side of the sealing part 24 in such a way that the sealing portion 21 is in a clamped position and pushes against the sealing part 24 with a sealing force when the cap 19 is in its closed position. For example, the sealing portion 21 is pushed to the side during closing of the cap 19, so that the locking means 26 and the locking element 27 can engage each other to form a tight snap-lock function. For example, the sealing part 24 pushes the sealing portion 21 to the side when resealed, so that the locking means 26 can be received in the locking element 27. Alternatively, the sealing part 24 is flexible in relation to the sealing portion 21 or both of the sealing portion 21 and the sealing part 24 are flexible.

[0032] With reference to Fig. 14 and Fig. 15 the package closure 10 is illustrated according to one embodiment of the invention, in which the cap 19 is connected to the neck 18 through a hinge portion 33. In the embodiment of Figs. 14 and 15 the cap 19 is provided with a first snap-lock part 34, wherein the neck 18 is provided with a second snap-lock part 35 forming a snap-lock function between the cap 19 and the neck 18, so that the cap 19 is detachably connectable to the neck 18 in its open position. Hence, the cap 19 is connectable to the neck 18 through the first and second snap-lock parts 34, 35, so that the cap can be kept in its open position during emptying of the package. For example, a rear portion of the cap 19 is connected to the neck 18 through the hinge portion 33, wherein the first snap-lock part 34 is arranged in the rear portion of the cap 19. For example, the first snap-lock part 34 is arranged as a ridge extending along the rear portion of the cap 19 and substantially in parallel to the hinge portion 33. The second snap-lock part 35 is, for example, arranged as a recess 36 extending radially outwards from the connecting portion 20 of the neck 18 to receive the first snap-lock part 34. The snap-lock function is provided through the inherent flexibility of the first snap-lock part 34 and/or the second snap-lock part 35 in a conventional manner.

[0033] With reference to Fig. 16 and Fig. 17 the package closure 10 is illustrated according to one embodiment of the invention in which the package closure 10 is provided with a first fastening part 37 and a second fastening part 38 for interaction with the first fastening part 37 to form an exterior fastener for fastening the cap 19 in its closed position and to prevent unintentional opening of the cap 19. The first fastening part 37 is adjustable from its locked position to an unlocked position. The first fastening part 37 is arranged on the cap 19 and comprises a part 39 projecting radially from the cap 19, and a part 40 projecting axially therefrom to form a downwards projecting clutch or similar. The axially projecting part 40 is, in the illustrated embodiment, provided with a wider free end 41 pointing downwards to form a receiving cavity for receiving the second fastening part 38. For example, the axially projecting part 40 is provided with grooves 42

or similar towards the sealing part 24 of the cap 19 to provide increased friction against the second fastening part 38. The second fastening part 38 comprises a radially outwards extending convexity 43 for interaction with the axially projecting part 40 of the first fastening part 37 to form a snap-lock function. The axially projecting part 40 is resiliently flexible due to the properties of the material, so that the axially projecting part 40 at least partially can be forced to pass the convexity 43 and be clamped behind the convexity 43 or the outermost portion of the convexity 43 by the resilient flexibility of the material. For example, the grooves 42 are arranged for abutment against the convexity 43 to prevent the convexity from leaving the receiving cavity and the axially projecting part 40 from disengaging the convexity 43.

[0034] With reference to Fig. 18 a tool core 14 and a package closure 10 is illustrated according to one embodiment. One difference to the embodiment of Figs. 1-3 is that the tool core 14 does not comprise the inner and outer tool cores 16, 17 but is formed as one unit. Hence, a faster production process is obtained as well as a less expensive device for producing the package closure 10 and material savings as the projection 25 can be omitted. Additionally, considerable energy savings and a more environmentally friendly production are obtained.

[0035] During production of the package closure 10 the tool core 14 extends along an interior side of the cap 19, the sealing part 24, the notch 23, the sealing portion 21 and along at least a substantial part of an inner side of the connecting portion 20. The tool core 14 interacts with the ejector 15, wherein the ejector 15 is arranged radially outside the tool core 14 and wherein the ejector 15 and the tool core 14 are movable in relation to each other in the axial direction. For example, the ejector is displaceable in the axial direction in relation to the tool core 14.

[0036] In the embodiment of Fig. 18 the sealing part 24 is provided with the flange 29 for interaction with the tool core 14, wherein the flange 29 extends radially inwards from the sealing part 24 for interaction with the recess 28 of the tool core 14, so that the tool core 14 can hold back the cap 19 when the connecting portion 20 is brought towards the cap 19 while the sealing portion 21 is folded inwards by means of the ejector 15.

[0037] As illustrated in Fig. 18, the sealing portion 21 is arranged with a length u which, for example, has a length equal to or larger than a length v of the sealing part 24. For example, the length u of the sealing portion 21 is 0.1-2 mm, 0.2-1 or about 0.5 mm longer than the length v of the sealing part 24. Hence, a bias is provided assisting in keeping the cap 19 in the closed position.

[0038] In Figs. 19-23 is an ejection process illustrated schematically in which a moulded package closure 10 is ejected from the device for producing it. In Fig. 19 the ejector 15 and the tool core 14 are illustrated in a position for moulding the package closure 10. For example, the package closure 10 is moulded in one piece in a corresponding way as described above, wherein the cap 19

and the neck 18 is one integrated piece. The jaws 11, 12 and the tool core 14 form a continuous mould for moulding the neck 18 and the cap 19 as one continuous piece. For example, the sealing portion 21 is connected to the sealing part 24 through the notch 23, so that a free end of the sealing portion 21 and a free end of the sealing part 24 are formed when the notch 23 is broken.

[0039] After moulding the package closure 10, when the material in the package closure 10 still is soft and has not entirely solidified or crystallized, the ejector 15 is brought axially forward in relation to the tool core 14, as illustrated by means of the arrows D and F in Figs. 19-20, while the tool core 14 simultaneously interacts with the flange 29 to hold back the cap 19, so that the neck is displaced in relation to the cap 19 by means of the ejector 15 during bending of the sealing portion 21 and folding along the notch 23. The ejector 15 is displaced in relation to the cap 19 while the sealing portion 21 simultaneously is folded inwards, so that the sealing portion 21 is bent towards the connecting portion 20. Hence, the sealing portion 21 is bent in relation to the connecting portion 20 of the neck 18 while the sealing portion 21 simultaneously is folded in relation to the sealing part 24 of the cap 19 and along the notch 23, so that the sealing portion 21 and the sealing part 24 are folded within the connecting portion 20 and the sealing portion 21 at least partially extends in parallel to the sealing part 24 between the connecting portion 20 and the sealing part 24 as illustrated in Fig. 21. For temporarily holding back the cap 19 the recess 28 of the tool core 14 holds the flange 29. Hence, the sealing portion 21 is folded to a position between the connecting portion 20 and the centre axis X in which the sealing portion 21 extends radially inwards and axially downwards for interaction with the sealing part 24 while the notch 23 connects the sealing portion 21 and the sealing part 24. For example, the sealing portion 21 is folded to a position in which the locking means 26 interacts with the locking element 27. Then, the ejector 15 is brought further axially forward while bringing along the package closure 10 in the same direction, as illustrated by means of the arrow G in Fig. 22, so that the flange 29, by an inherent flexibility of the flange 29, the sealing part 24 and the sealing portion 21, are disengaged from the tool core 14 and can leave the device for producing the package closure 10. For example, the sealing part 24 and the sealing portion 21 return to their original positions by their flexibility, as illustrated in Fig. 23.

[0040] With reference to Fig. 24 the package closure 10 according to Fig. 23 is illustrated wherein the package closure 10 is connected to a package 32 and is unopened and the notch 23 not has been broken. Opening and re-sealing of the package closure 10 work in a corresponding manner as described above with reference to Figs. 10-13.

[0041] With reference to Fig. 25 and Fig. 26 a package closure 10 is illustrated according to one embodiment of the invention in which the cap 19 and the neck 18 have a triangular shape with rounded corners. Hence, the

package closure 10 is formed with a thinner part and a wider part, wherein the thinner part is arranged to facilitate emptying of a package connected to the package closure 10. For example, the wider part of the cap 19 is connected to the wider part of the neck 18 through a hinge portion 33.

Claims

1. A package closure (10) comprising a centre axis (X), a neck (18) provided with an opening, and a cap (19) for closing the opening, wherein the neck (18) comprises a connecting portion (20) for connection to a package (32), and a sealing portion (21) projecting radially inwards from the connecting portion (20) to interact with the cap (19) to form a seal between them, wherein the cap (19), before opening thereof, is connected to the sealing portion (21) through a notch (23), wherein the cap (19) is removable from at least a part of the sealing portion (21) by tearing along the notch (23), and wherein the cap (19) is provided with a sealing part (24) projecting from an interior side of the cap (19) to interact with the sealing portion (21) of the neck (18), so that the package closure (10) is resealable, **characterised in**

that the sealing portion (21) and the sealing part (24) are folded with-in the connecting portion (20), wherein the sealing portion (21) extends downwards, and

that the sealing portion (21), at least after resealing of the package closure (10), extends at least partially in axial direction between the connecting portion (20) and the sealing part (24) and form the seal by resilient interaction with the sealing part (24).

2. A package closure according to claim 1, wherein the sealing part (24) is arranged at a distance (T) in the radial direction from an inner side of the connecting portion (20) of the neck (18), wherein an inner side of a free end of the sealing portion (21) is arranged at a distance (S) in the radial direction from an inner side of the connecting portion (20) of the neck (18) after opening of the package closure (10), and wherein the distance (S) between the inner side of the free end of the sealing portion (21) and the connecting portion (20) of the neck (18) is larger than the distance (T) between the sealing part (24) and the connecting portion (20) of the neck (18) when the sealing portion (21) is unaffected by the sealing part (24).
3. A package closure according to any of the preceding claims, wherein an interior side of the cap (19) is provided with a radially inwards projecting flange (29) for interaction with a tool core (14) in a device

- for producing the package closure (10), so that the cap (19) is connected to the tool core (14) during production thereof.
4. A package closure according to claim 3, wherein the sealing part (24) is provided with the flange (29). 5
 5. A package closure according to claim 3, wherein an interior side of the cap (19) is provided with a flexible projection (25) with the flange (29), the flexible projection (25) being arranged radially within the sealing part (24) and extending axially. 10
 6. A package closure according to any of claims 3-5, wherein the sealing portion (21) is flexible in relation to the connecting portion (20), so that the connecting portion (20) is displaceable in axial direction in relation to the cap (19) during bending of the sealing portion (21) and folding along the notch (23) when the cap (19) is connected to the tool core (14) by the flange (29). 15
 7. A package closure according to any of the preceding claims, wherein a length (u) of the sealing portion (21) is longer than a length (v) of the sealing part (24). 20
 8. A package closure according to any of the preceding claims, wherein the sealing portion (21) and the sealing part (24) interact through a snap-lock function. 25
 9. A package closure according to any of the preceding claims, wherein the cap (19) is connected to the neck (18) through a hinge portion (33), so that the cap (19) can be pivoted around the hinge portion (33), and wherein a portion of the cap (19) and the neck (18) interact through a snap-lock function, so that the cap (19) can be connected to the neck (18) in its open position. 30
 10. A package closure according to any of the preceding claims, wherein the notch (23), before opening of the package closure (10), is arranged in contact with the sealing part (24) and the sealing portion (21). 35
 11. A device for producing a package closure (10) having a centre axis (X), a neck (18) and a radially extending cap (19) for closing a radially extending opening of the neck (18) according to claim 1-10, comprising a movable first jaw (11), a movable second jaw (12) and a tool core (14) for interaction with the jaws (11, 12) to form a mould for the package closure (10), and an ejector (15) for ejecting the produced package closure (10), **characterised in** 40

that the tool core (14) and the jaws (11, 12) are arranged to form a connecting portion (20) and a sealing portion (21) of the neck (18) and a tearable notch (23) between the sealing portion (21) 45
 - and a sealing part (24) of the cap (19), wherein the cap (19) is removable from at least a part of the sealing portion (21) by tearing along the notch (23), and 50

that the tool core (14) comprises a radially extending recess (28) for forming and interaction with a flange (29) of the cap (19), so that the connecting portion (20) of the neck (18) is displaceable in relation to the cap (19) by means of the ejector (15) during bending of the sealing portion (21) and folding along the notch (23) until the sealing portion (21) and the sealing part (24) are folded within the connecting portion (20) when the cap (19) is connected to the tool core (14) through the flange (29), wherein the package closure is resealable by interaction between the sealing portion (21) and the sealing part (24) after tearing the notch (23).
 12. A device according to claim 11, wherein the jaws (11, 12) and the tool core (14) are arranged to form the neck (18) and the cap (19) as one integral unit.
 13. A device according to any of claims 11-12, wherein the tool core (14) is arranged within the ejector (15) in the radial direction.
 14. Method for producing a package closure (10) having a centre axis (X), a neck (18) and a radially extending cap (19) for closing a radially extending opening of the neck (18) according to claim 1-10, **characterised in** the steps of

by means of movable jaws (11, 12) and a tool core (14) forming a connecting portion (20) and a sealing portion (21) of the neck (18) and a tearable notch (23) between the sealing portion (21) and a sealing part (24) of the cap (19), wherein the cap (19) is removable from at least a part of the sealing portion (21) by tearing along the notch (23), 55

by means of a radially extending recess (28) of the tool core (14) forming a flange (29) on the interior side of the cap (19), the flange (29) being for interaction with the tool core (14),

removing the jaws (11, 12) from the moulded package closure (10), by means of the tool core (14) holding back the cap (19) by the flange (29) arranged on the interior side of the cap (19) and simultaneously, by means of an ejector (15), displacing the connecting portion (20) of the neck (18) in relation to the cap (19) during bending of the sealing portion (21) and folding along the notch (23) until the sealing portion (21) and the sealing part (24) are folded within the connecting portion (20), wherein the package closure is resealable by interaction between the sealing portion (21) and the sealing part (24) after tearing the notch (23), and

by means of the ejector (15) displacing the package closure (10) in relation to the tool core (14), so that

the flange (29) is disengaged from the tool core (14).

15. Method according to claim 14, comprising the step of producing the neck (18) and the cap (19) as one integral unit.
16. Method according to claim 14 or 15, comprising the step of displacing the connecting portion (20) of the neck (18) in relation to the cap (19), bending the sealing portion (21) and folding along the notch (23) so that the sealing portion (21) is folded inwards and is arranged between the connecting portion (20) of the neck (18) and a centre axis (X) of the package closure (10).

Patentansprüche

1. Verpackungsverschluss (10), aufweisend eine Mittelachse (X), einen Hals (18), der über eine Öffnung verfügt, und einen Deckel (19) zum Schließen der Öffnung, wobei der Hals (18) einen Verbindungsabschnitt (20) zum Verbinden mit einer Verpackung (32) und einen Versiegelungsabschnitt (21), der von dem Verbindungsabschnitt (20) aus radial nach innen ragt, um mit dem Deckel (19) zu interagieren, um eine Versiegelung dazwischen auszubilden, aufweist, wobei der Deckel (19) vor seiner Öffnung mit dem Versiegelungsabschnitt (21) durch eine Kerbe (23) verbunden ist, wobei der Deckel (19) von zumindest einem Teil des Versiegelungsabschnitts (21) entfernt werden kann, indem entlang der Kerbe (23) gezogen wird, und wobei der Deckel (19) mit einem Versiegelungsteil (24) versehen ist, das von einer Innenseite des Deckels (19) aus hervorragt, um mit dem Versiegelungsabschnitt (21) des Halses (18) zu interagieren, so dass der Verpackungsverschluss (10) wiederverschließbar ist, **dadurch gekennzeichnet, dass** der Versiegelungsabschnitt (21) und der Versiegelungsteil (24) in dem Verbindungsabschnitt (20) gefaltet sind, wobei der Versiegelungsabschnitt (21) nach unten verläuft, und dass der Versiegelungsabschnitt (21), zumindest nach dem Wiederverschließen des Verpackungsverschlusses (10), zumindest teilweise in axialer Richtung zwischen dem Verbindungsabschnitt (20) und dem Versiegelungsteil (24) verläuft, und die Versiegelung durch elastische Interaktion mit dem Versiegelungsteil (24) bildet.
2. Verpackungsverschluss nach Anspruch 1, wobei der Versiegelungsteil (24) in einer Entfernung (T) in der radialen Richtung von einer Innenseite des Verbindungsabschnitts (20) des Halses (18) angeordnet ist, wobei eine Innenseite eines freien Ends des Versiegelungsabschnitts (21) nach dem Öffnen des Verpackungsverschlusses (10) in einer Entfernung (S) in der radialen Richtung von einer Innenseite des

Verbindungsabschnitts (20) des Halses (18) angeordnet ist, und wobei die Entfernung (S) zwischen der Innenseite des freien Ends des Versiegelungsabschnitts (21) und dem Verbindungsabschnitt (20) des Halses (18) größer ist als die Entfernung (T) zwischen dem Versiegelungsteil (24) und dem Verbindungsabschnitt (20) des Halses (18), wenn der Versiegelungsabschnitt (21) von dem Versiegelungsteil (24) nicht beeinflusst wird.

3. Verpackungsverschluss nach einem der vorgenannten Ansprüche, wobei eine Innenseite des Deckels (19) mit einem radial nach innen ragenden Flansch (29) zum Interagieren mit einem Werkzeugkern (14) in einer Vorrichtung versehen ist, um den Verpackungsverschluss (10) herzustellen, so dass der Deckel (19) während seiner Herstellung mit dem Werkzeugkern (14) verbunden ist.
4. Verpackungsverschluss nach Anspruch 3, wobei der Versiegelungsteil (24) mit dem Flansch (29) versehen ist.
5. Verpackungsverschluss nach Anspruch 3, wobei eine Innenseite des Deckels (19) über einen flexiblen Vorsprung (25) mit dem Flansch (29) verfügt, wobei der flexible Vorsprung (25) radial innerhalb des Versiegelungsteils (24) angeordnet ist und axial verläuft.
6. Verpackungsverschluss nach einem der Ansprüche 3 bis 5, wobei der Versiegelungsabschnitt (21) im Verhältnis zu dem Verbindungsabschnitt (20) flexibel ist, so dass der Verbindungsabschnitt (20) im Verhältnis zu dem Deckel (19) während des Biegens des Versiegelungsabschnitts (21) in axialer Richtung verschiebbar ist und sich entlang der Kerbe (23) faltet, wenn der Deckel (19) mit dem Werkzeugkern (14) neben dem Flansch (29) verbunden ist.
7. Verpackungsverschluss nach einem der vorgenannten Ansprüche, wobei eine Länge (u) des Versiegelungsabschnitts (21) länger ist als eine Länge (v) des Versiegelungsteils (24).
8. Verpackungsverschluss nach einem der vorgenannten Ansprüche, wobei der Versiegelungsabschnitt (21) und der Versiegelungsteil (24) durch eine Schnappverschlussfunktion interagieren.
9. Verpackungsverschluss nach einem der vorgenannten Ansprüche, wobei der Deckel (19) mit dem Hals (18) durch einen Scharnierabschnitt (33) verbunden ist, so dass der Deckel (19) um den Scharnierabschnitt (33) herum geschwenkt werden kann, und wobei ein Abschnitt des Deckels (19) und des Halses (18) durch eine Schnappverschlussfunktion interagieren, so dass der Deckel (19) mit dem Hals (18) in seiner geöffneten Position verbunden werden

kann.

10. Verpackungsverschluss nach einem der vorgenannten Ansprüche, wobei die Kerbe (23) vor dem Öffnen des Verpackungsverschlusses (10) so angeordnet ist, dass sie sich mit dem Versiegelungsteil (24) und dem Versiegelungsabschnitt (21) in Kontakt befindet. 5
11. Vorrichtung zum Herstellen eines Verpackungsverschlusses (10) mit einer Mittelachse (X), einem Hals (18) und einem radial verlaufenden Deckel (19) zum Schließen einer radial verlaufenden Öffnung des Halses (18) nach einem der Ansprüche 1 bis 10, aufweisend eine bewegliche erste Backe (11), eine bewegliche zweite Backe (12) und einen Werkzeugkern (14) zum Interagieren mit den Backen (11, 12), um eine Form für den Verpackungsverschluss (10) zu bilden, sowie einen Ausstoßer (15), um den hergestellten Verpackungsverschluss (10) auszustoßen, **dadurch gekennzeichnet** **dass** der Werkzeugkern (14) und die Backen (11, 12) so angeordnet sind, dass sie einen Verbindungsabschnitt (20) und einen Versiegelungsabschnitt (21) des Halses (18) und eine ziehbare Kerbe (23) zwischen dem Versiegelungsabschnitt (21) und einem Versiegelungsteil (24) des Deckels (19) bilden, wobei der Deckel (19) von zumindest einem Teil des Versiegelungsabschnitts (21) durch Ziehen entlang der Kerbe (23) entfernt werden kann, und **dass** der Werkzeugkern (14) eine radial verlaufende Vertiefung (28) zum Bilden eines Flansches (29) des Deckels (19) und zum Interagieren mit selbigem aufweist, so dass der Verbindungsabschnitt (20) des Halses (18) während des Biegens des Versiegelungsabschnitts (21) und Faltens entlang der Kerbe (23) im Verhältnis zu dem Deckel (19) durch den Ausstoßer (15) verschiebbar ist, bis der Versiegelungsabschnitt (21) und der Versiegelungsteil (24) innerhalb des Verbindungsabschnitts (20) gefaltet werden, wenn der Deckel (19) mit dem Werkzeugkern (14) durch den Flansch (29) verbunden ist, wobei der Verpackungsverschluss durch Interaktion zwischen dem Versiegelungsabschnitt (21) und dem Versiegelungsteil (24) nach dem Ziehen der Kerbe (23) wiederverschließbar ist. 10 15 20 25 30 35 40 45
12. Vorrichtung nach Anspruch 11, wobei die Backen (11, 12) und der Werkzeugkern (14) so angeordnet sind, dass sie den Hals (18) und den Deckel (19) als eine einstückige Einheit bilden. 50
13. Vorrichtung nach einem der Ansprüche 11 bis 12, wobei der Werkzeugkern (14) innerhalb des Ausstoßers (15) in der radialen Richtung angeordnet ist. 55
14. Verfahren zum Herstellen eines Verpackungsverschlusses (10) mit einer Mittelachse (X), einem Hals

(18) und einem radial verlaufenden Deckel (19) zum Schließen einer radial verlaufenden Öffnung des Halses (18) nach einem der Ansprüche 1 bis 10, **gekennzeichnet durch** die folgenden Schritte:

Ausbilden eines Verbindungsabschnitts (20) und eines Versiegelungsabschnitts (21) des Halses (18) und einer ziehbaren Kerbe (23) zwischen dem Versiegelungsabschnitt (21) und einem Versiegelungsteil (24) des Deckels (19) durch bewegliche Backen (11, 12) und einen Werkzeugkern (14), wobei der Deckel (19) von zumindest einem Teil des Versiegelungsabschnitts (21) **durch** Ziehen entlang der Kerbe (23) entfernt werden kann,
 Ausbilden eines Flansches (29) auf der Innenseite des Deckels (19) **durch** eine radial verlaufende Vertiefung (28) des Werkzeugkerns (14), wobei der Flansch (29) zur Interaktion mit dem Werkzeugkern (14) dient,
 Entfernen der Backen (11, 12) aus dem geformten Verpackungsverschluss (10),
 Zurückhalten des Deckels (19) neben dem Flansch (29), der auf der Innenseite des Deckels (19) angeordnet ist, **durch** den Werkzeugkern (14), und gleichzeitig Verschieben des Verbindungsabschnitts (20) des Halses (18) im Verhältnis zu dem Deckel (19) **durch** einen Ausstoßer (15) während des Biegens des Versiegelungsabschnitts (21) und des Faltens entlang der Kerbe (23), bis der Versiegelungsabschnitt (21) und der Versiegelungsteil (24) innerhalb des Verbindungsabschnitts (20) gefaltet werden, wobei der Verpackungsverschluss durch Interaktion zwischen dem Versiegelungsabschnitt (21) und dem Versiegelungsteil (24) nach dem Ziehen der Kerbe (23) wiederverschließbar ist,
 und
 Verschieben des Verpackungsverschlusses (10) im Verhältnis zu dem Werkzeugkern (14) **durch** den Ausstoßer (15), so dass der Flansch (29) von dem Werkzeugkern (14) losgelassen wird.

15. Verfahren nach Anspruch 14, aufweisend den Schritt des Herstellens des Halses (18) und des Deckels (19) als eine einstückige Einheit.

16. Verfahren nach Anspruch 14 oder 15, aufweisend den Schritt des Verschiebens des Verbindungsabschnitts (20) des Halses (18) im Verhältnis zu dem Deckel (19), Biegen des Versiegelungsabschnitts (21) und Faltens entlang der Kerbe (23), so dass der Versiegelungsabschnitt (21) nach innen gefaltet wird und zwischen dem Verbindungsabschnitt (20) des Halses (18) und einer Mittelachse (X) des Verpackungsverschlusses (10) angeordnet ist.

Revendications

1. Fermeture d'emballage (10) comprenant un axe central (X), un goulot (18) doté d'une ouverture, et un bouchon (19) destiné à fermer l'ouverture, dans laquelle le goulot (18) comprend une partie de connexion (20) pour une connexion à un emballage (32), et une partie d'étanchéité (21) dépassant radialement vers l'intérieur par rapport à la partie de connexion (20) pour interagir avec le bouchon (19) pour former une étanchéité entre eux, dans lequel le bouchon (19), avant son ouverture, est connecté à la partie d'étanchéité (21) par le biais d'une encoche (23), dans laquelle le bouchon (19) est amovible à partir d'au moins une partie de la partie d'étanchéité (21) en déchirant le long de l'encoche (23), et dans laquelle le bouchon (19) est doté d'une pièce d'étanchéité (24) dépassant par rapport à un côté intérieur du bouchon (19) pour interagir avec la partie d'étanchéité (21) du goulot (18), de sorte que la fermeture d'emballage (10) soit libérable, **caractérisée en ce que** la partie d'étanchéité (21) et la pièce d'étanchéité (24) sont repliées dans la partie de connexion (20), dans lequel la partie d'étanchéité (21) s'étend vers le bas, et **en ce que** la partie d'étanchéité (21), au moins après libération de la fermeture d'emballage (10), s'étend au moins partiellement dans une direction axiale entre la partie de connexion (20) et la pièce d'étanchéité (24) et forment l'étanchéité par une interaction résiliente avec la pièce d'étanchéité (24).
2. Fermeture d'emballage selon la revendication 1, dans laquelle la pièce d'étanchéité (24) est disposée à une distance (T) dans la direction radiale à partir d'un côté intérieur de la partie de connexion (20) du goulot (18), dans laquelle un côté intérieur d'une extrémité libre de la partie d'étanchéité (21) est disposé à une distance (S) dans la direction radiale par rapport à un côté intérieur de la partie de connexion (20) du goulot (18) après ouverture de la fermeture d'emballage (10), et dans laquelle la distance (S) entre le côté intérieur de l'extrémité libre de la partie d'étanchéité (21) et la partie de connexion (20) du goulot (18) est plus grande que la distance (T) entre la pièce d'étanchéité (24) et la partie de connexion (20) du goulot (18) lorsque la partie d'étanchéité (21) n'est pas affectée par la pièce d'étanchéité (24).
3. Fermeture d'emballage selon l'une quelconque des revendications précédentes, dans laquelle un côté intérieur du bouchon (19) est doté d'une bride dépassant radialement vers l'intérieur (29) pour une interaction avec une partie centrale d'outil (14) dans un dispositif pour produire la fermeture d'emballage (10), de sorte que le bouchon (19) soit connecté à la partie centrale d'outil (14) au cours de sa production.
4. Fermeture d'emballage selon la revendication 3, dans laquelle la pièce d'étanchéité (24) est dotée de la bride (29).
5. Fermeture d'emballage selon la revendication 3, dans laquelle un côté intérieur du bouchon (19) est doté d'une protubérance flexible (25) avec la bride (29), la protubérance flexible (25) étant disposée radialement dans la pièce d'étanchéité (24) et en s'étendant axialement.
6. Fermeture d'emballage selon l'une quelconque des revendications 3 à 5, dans laquelle la partie d'étanchéité (21) est flexible par rapport à la partie de connexion (20), de sorte que la partie de connexion (20) soit déplaçable dans une direction axiale par rapport au bouchon (19) au cours de la flexion de la partie d'étanchéité (21) et du pliage le long de l'encoche (23) lorsque le bouchon (19) est connecté à la partie centrale d'outil (14) par la bride (29).
7. Fermeture d'emballage selon l'une quelconque des revendications précédentes, dans laquelle une longueur (u) de la partie d'étanchéité (21) est plus longue qu'une longueur (v) de la pièce d'étanchéité (24).
8. Fermeture d'emballage selon l'une quelconque des revendications précédentes, dans laquelle la partie d'étanchéité (21) et la pièce d'étanchéité (24) interagissent par le biais d'une fonction de blocage par enclenchement.
9. Fermeture d'emballage selon l'une quelconque des revendications précédentes, dans lequel le bouchon (19) est connecté au goulot (18) par le biais d'une partie de charnière (33), de sorte que le bouchon (19) puisse pivoter autour de la partie de charnière (33), et dans laquelle une partie du bouchon (19) et le goulot (18) interagissent par le biais d'une fonction de blocage par enclenchement, de sorte que le bouchon (19) puisse être connecté au goulot (18) dans sa position ouverte.
10. Fermeture d'emballage selon l'une quelconque des revendications précédentes, dans laquelle l'encoche (23), avant ouverture de la fermeture d'emballage (10), est disposée en contact avec la pièce d'étanchéité (24) et la partie d'étanchéité (21).
11. Dispositif de production d'une fermeture d'emballage (10) ayant un axe central (X), un goulot (18) et un bouchon s'étendant radialement (19) destiné à fermer une ouverture s'étendant radialement du goulot (18) selon l'une quelconque des revendications 1 à 10, comprenant une première mâchoire mobile (11), une deuxième mâchoire mobile (12) et une partie centrale d'outil (14) pour une interaction avec

les mâchoires (11, 12) pour former un moule pour la fermeture d'emballage (10), et un éjecteur (15) destiné à éjecter la fermeture d'emballage (10) produite, **caractérisé**

en ce que la partie centrale d'outil (14) et les mâchoires (11, 12) sont disposées pour former une partie de connexion (20) et une partie d'étanchéité (21) du goulot (18) et une encoche pouvant être déchirée (23) entre la partie d'étanchéité (21) et une pièce d'étanchéité (24) du bouchon (19), dans lequel le bouchon (19) est amovible à partir d'au moins une partie de la partie d'étanchéité (21) par un déchirement le long de l'encoche (23), et

en ce que la partie centrale d'outil (14) comprend un évidement s'étendant radialement (28) pour former une interaction avec une bride (29) du bouchon (19), de sorte que la partie de connexion (20) du goulot (18) puisse être déplacée par rapport au bouchon (19) au moyen de l'éjecteur (15) au cours d'une flexion de la partie d'étanchéité (21) et un pliage le long de l'encoche (23) jusqu'à ce que la partie d'étanchéité (21) et la pièce d'étanchéité (24) soient pliées dans la partie de connexion (20) lorsque le bouchon (19) est connecté à la partie centrale d'outil (14) par la bride (29), dans lequel la fermeture d'emballage peut être libérée par interaction entre la partie d'étanchéité (21) et la pièce d'étanchéité (24) après déchirement de l'encoche (23).

12. Dispositif selon la revendication 11, dans lequel les mâchoires (11, 12) et la partie centrale d'outil (14) sont disposées pour former le goulot (18) et le bouchon (19) comme une unité solidaire.

13. Dispositif selon l'une quelconque des revendications 11 à 12, dans lequel la partie centrale d'outil (14) est disposée dans l'éjecteur (15) dans la direction radiale.

14. Procédé de production d'une fermeture d'emballage (10) ayant un axe central (X), un goulot (18) et un bouchon s'étendant radialement (19) destiné à fermer une ouverture s'étendant radialement du goulot (18) selon l'une quelconque des revendications 1 à 10, **caractérisé par** les étapes consistant à au moyen de mâchoires mobiles (11, 12) et d'une partie centrale d'outil, former une partie de connexion (20) et une partie d'étanchéité (21) du goulot (18) et une encoche pouvant être déchirée (23) entre la partie d'étanchéité (21) et une pièce d'étanchéité (24) du bouchon (19), dans lequel le bouchon (19) est amovible à partir d'au moins une partie de la partie d'étanchéité (21) par un déchirement le long de l'encoche (23), et au moyen d'un évidement s'étendant radialement (28) du noyau d'outil (14) former une bride (29) sur le côté intérieur du bouchon (19), la bride (29) étant destinée à une interaction avec la partie centrale

d'outil (14),

retirer les mâchoires (11, 12) de la fermeture d'emballage (10) moulée,

au moyen du noyau d'outil (14) retenir le bouchon (19) avec la bride (29) disposée sur le côté intérieur du bouchon (19) et simultanément, au moyen d'un éjecteur (15), déplacer la partie de connexion (20) du goulot (18) par rapport au bouchon (19) au cours de la flexion de la partie d'étanchéité (21) et du pliage le long de l'encoche (23) jusqu'à ce que la partie d'étanchéité (21) et la pièce d'étanchéité (24) soient pliées dans la partie de connexion (20), dans lequel la fermeture d'emballage est libérable par interaction entre la partie d'étanchéité (21) et la pièce d'étanchéité (24) après déchirement de l'encoche (23), et

au moyen de l'éjecteur (15) déplacer la fermeture d'emballage (10) par rapport au noyau d'outil (14) de sorte que la bride (29) soit désengagée par rapport au noyau d'outil (14).

15. Procédé selon la revendication 14, comprenant l'étape consistant à produire le goulot (18) et le bouchon (19) comme une unité solidaire.

16. Procédé selon la revendication 14 ou 15, comprenant les étapes consistant à déplacer la partie de connexion (20) du goulot (18) par rapport au bouchon (19), faire fléchir la partie d'étanchéité (21) et plier le long de l'encoche (23) de sorte que la partie d'étanchéité (21) soit pliée vers l'intérieur et soit disposée entre la partie de connexion (20) du goulot (18) et un axe central (X) de la fermeture d'emballage (10).

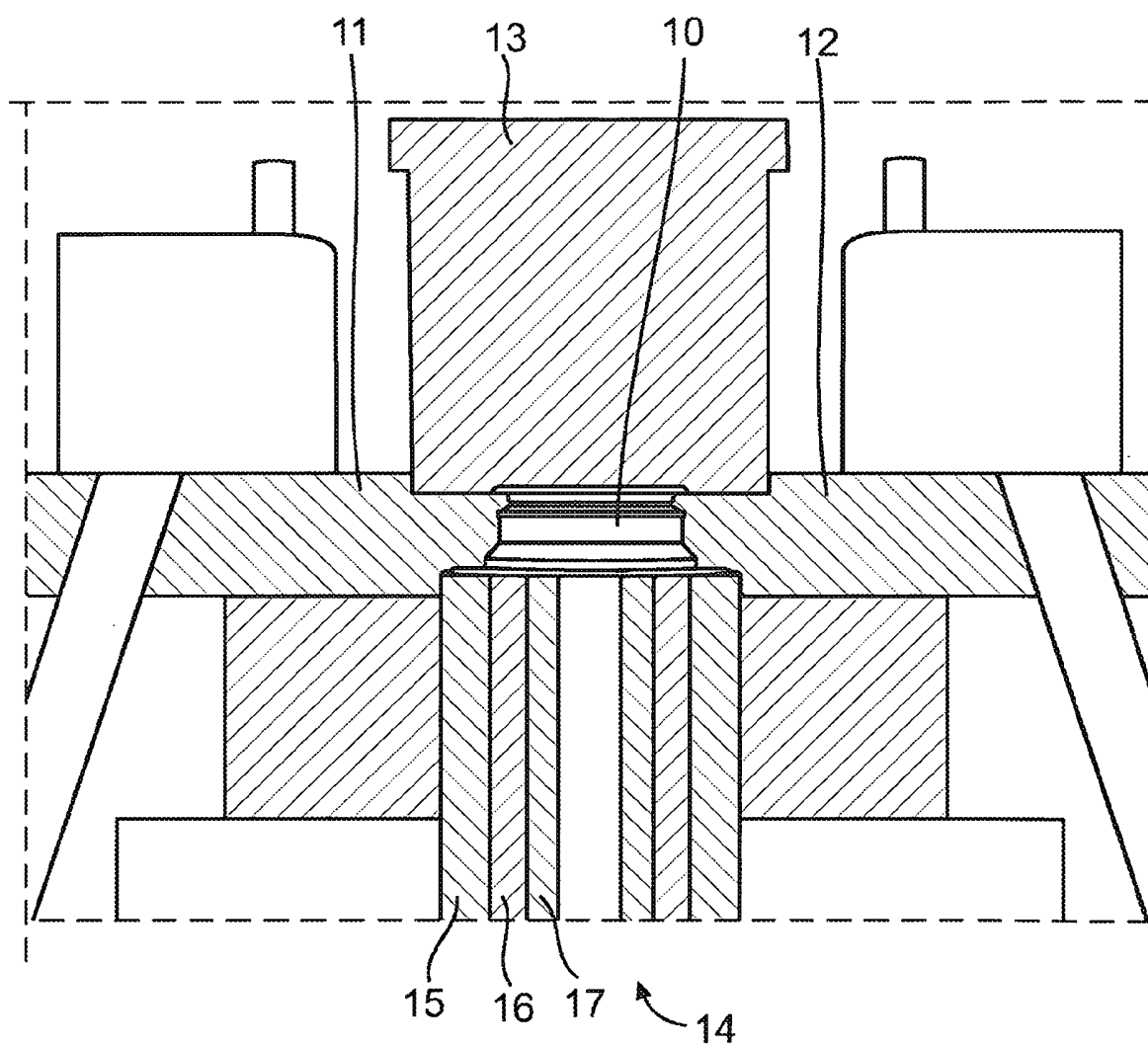


Fig. 1

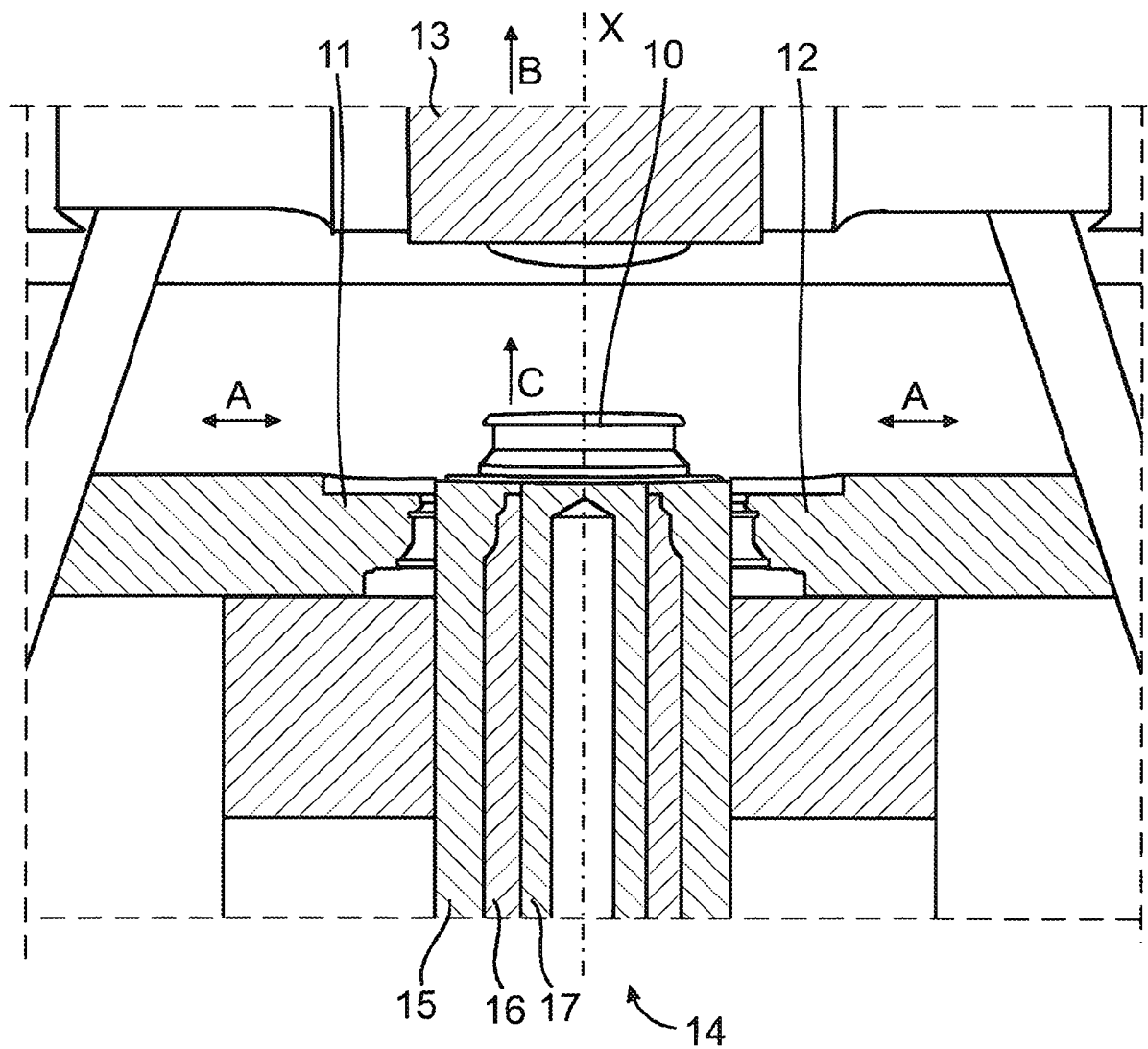


Fig. 2

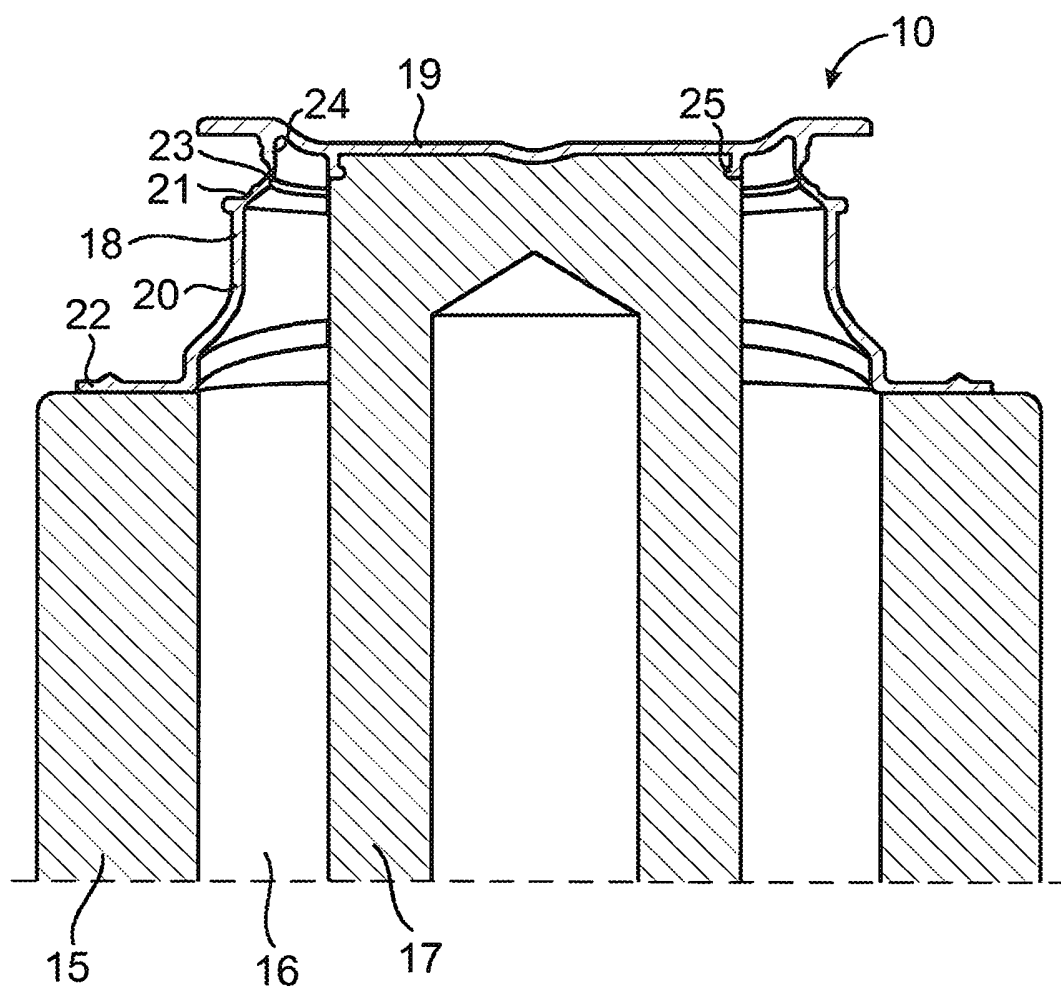


Fig. 3

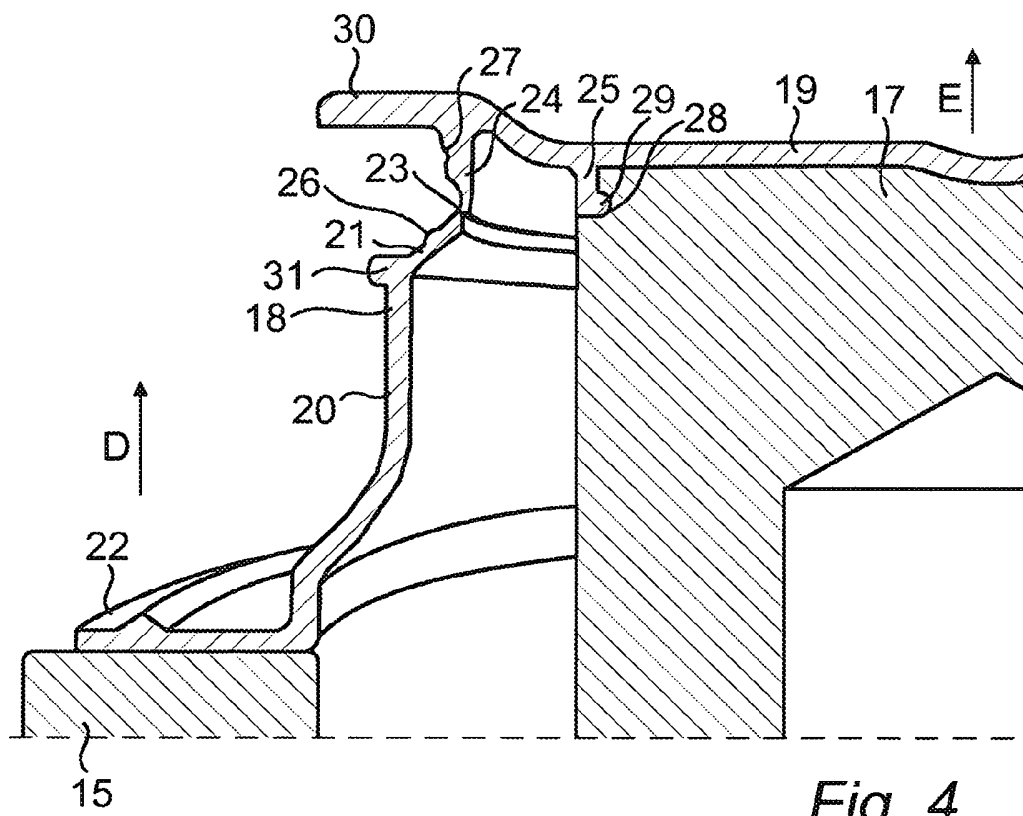


Fig. 4

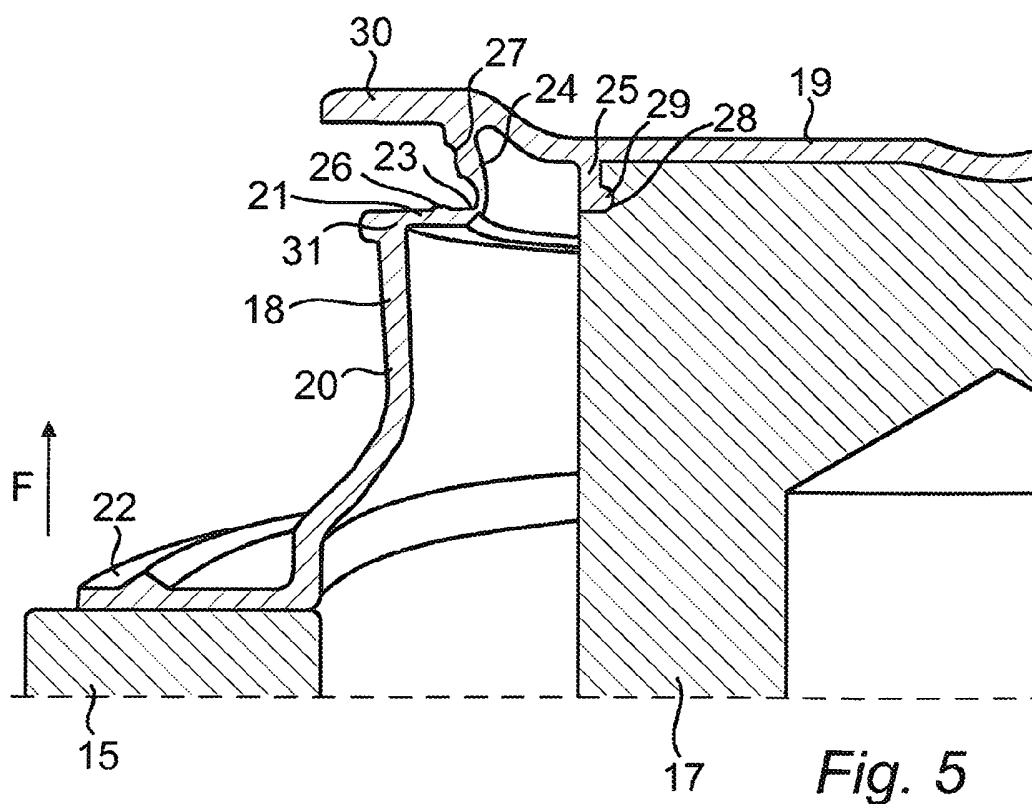
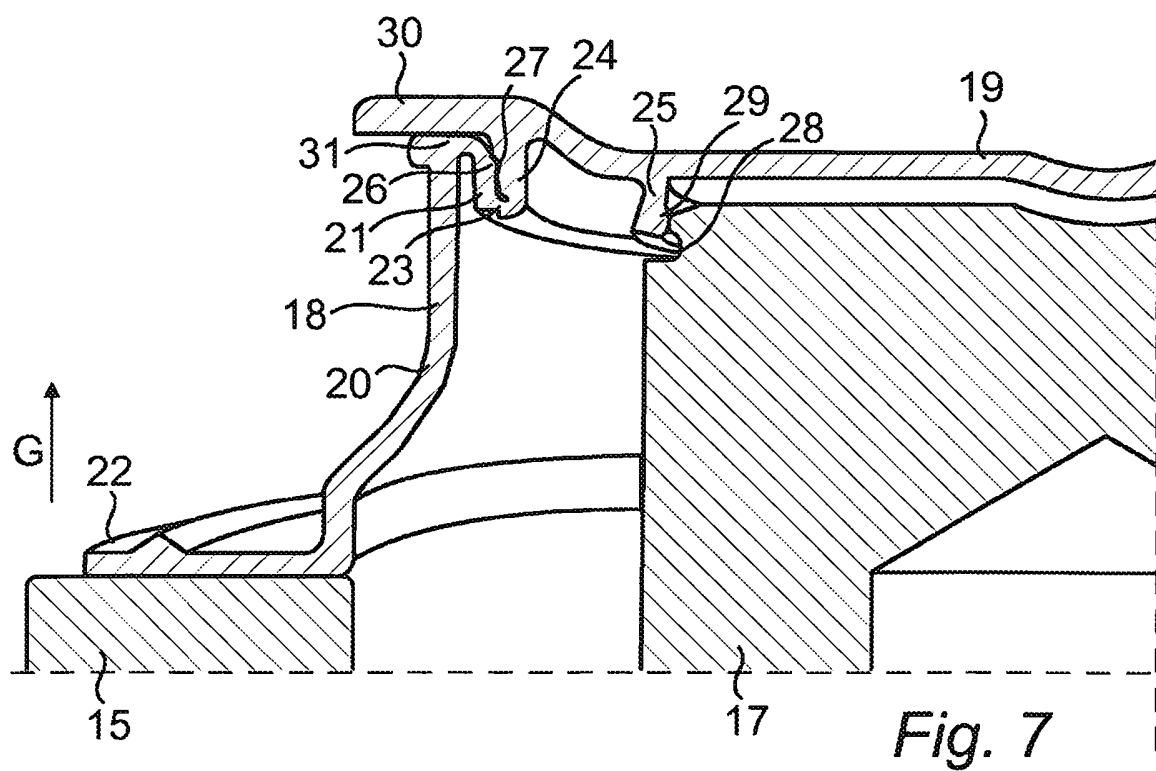
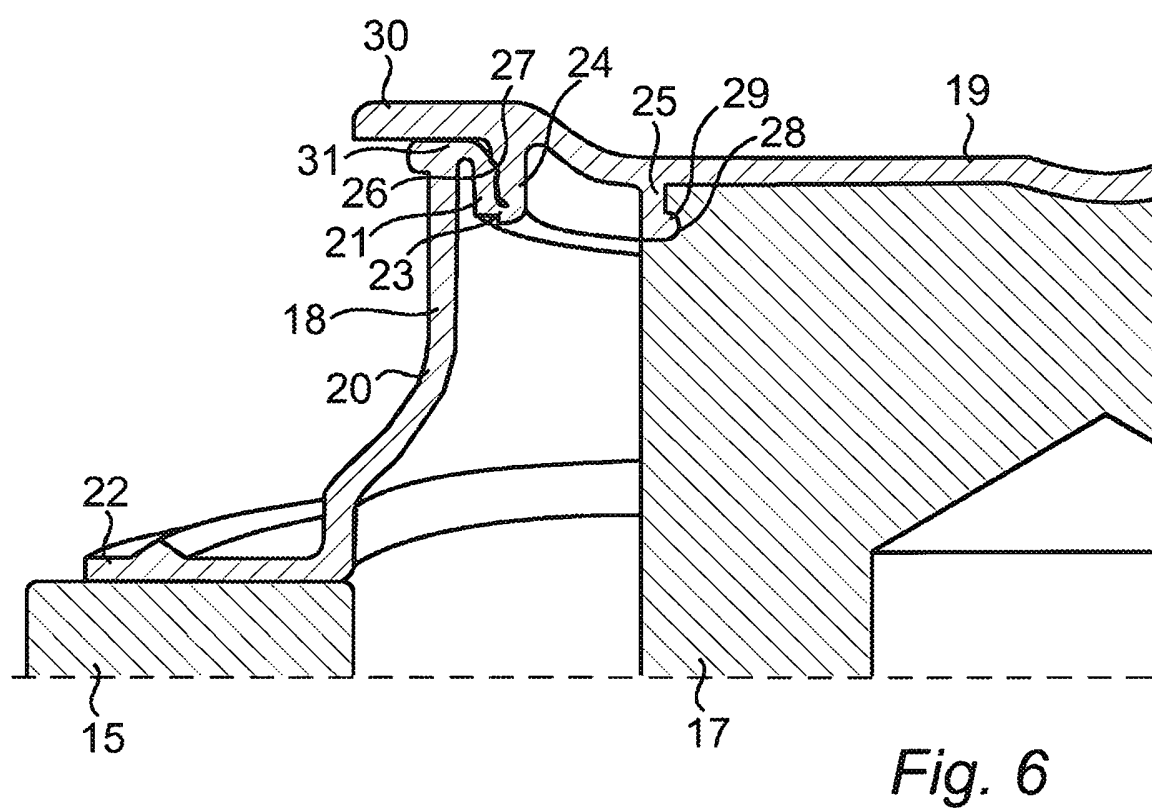


Fig. 5



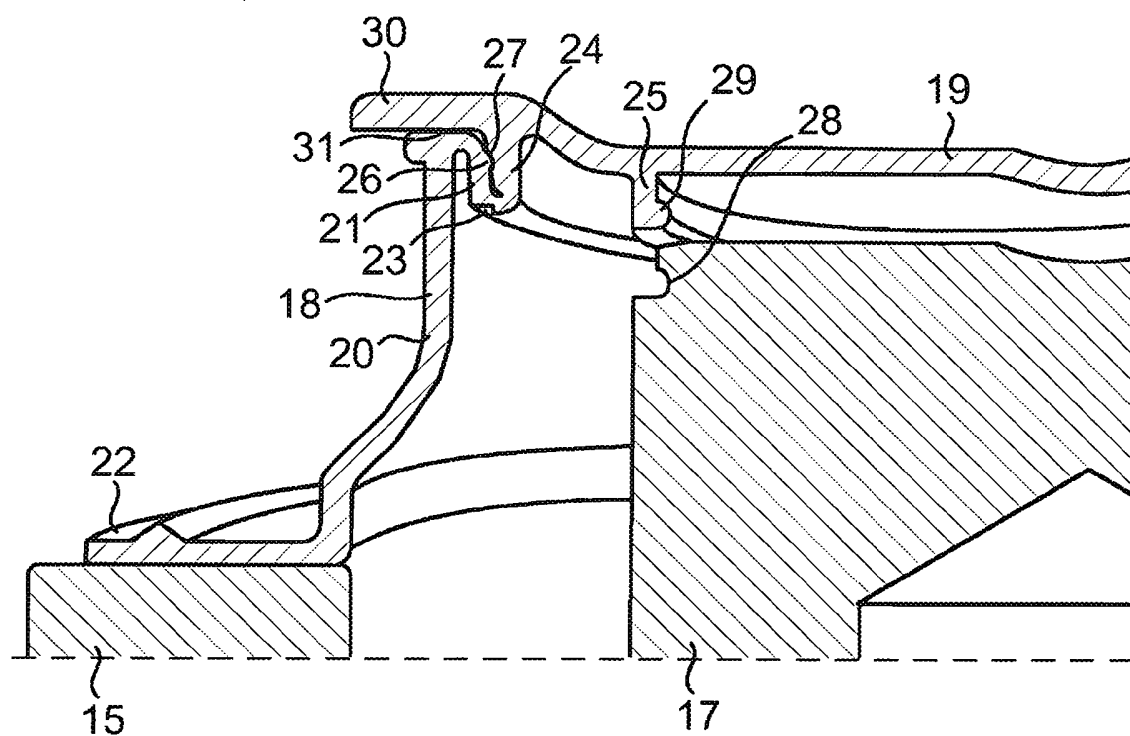


Fig. 8

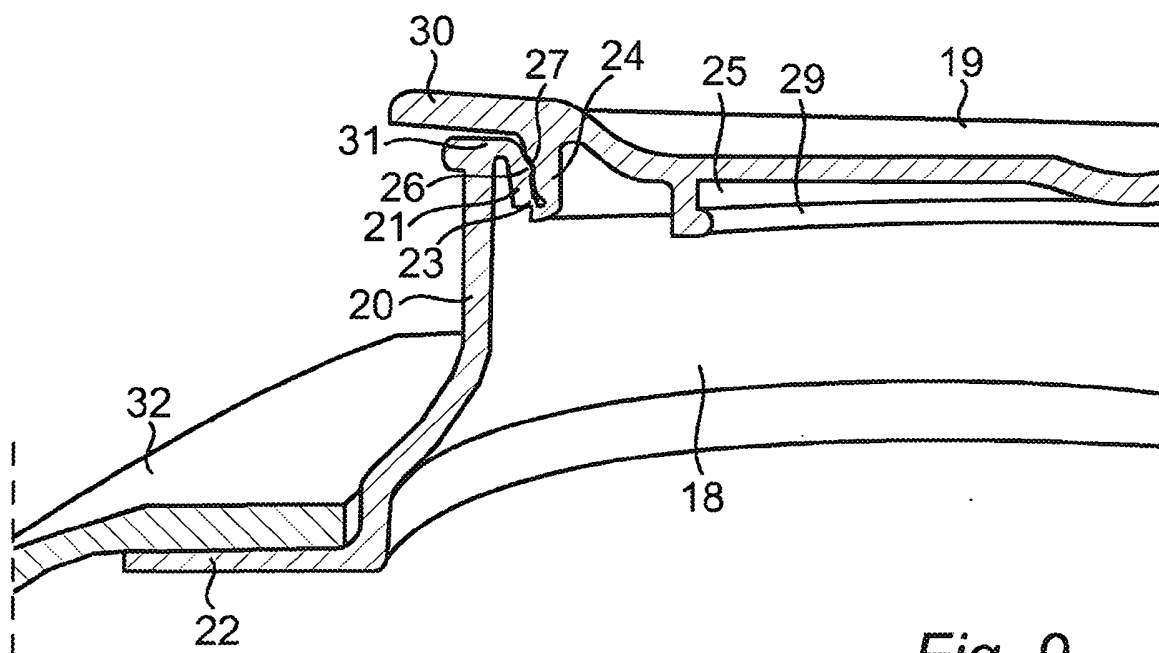
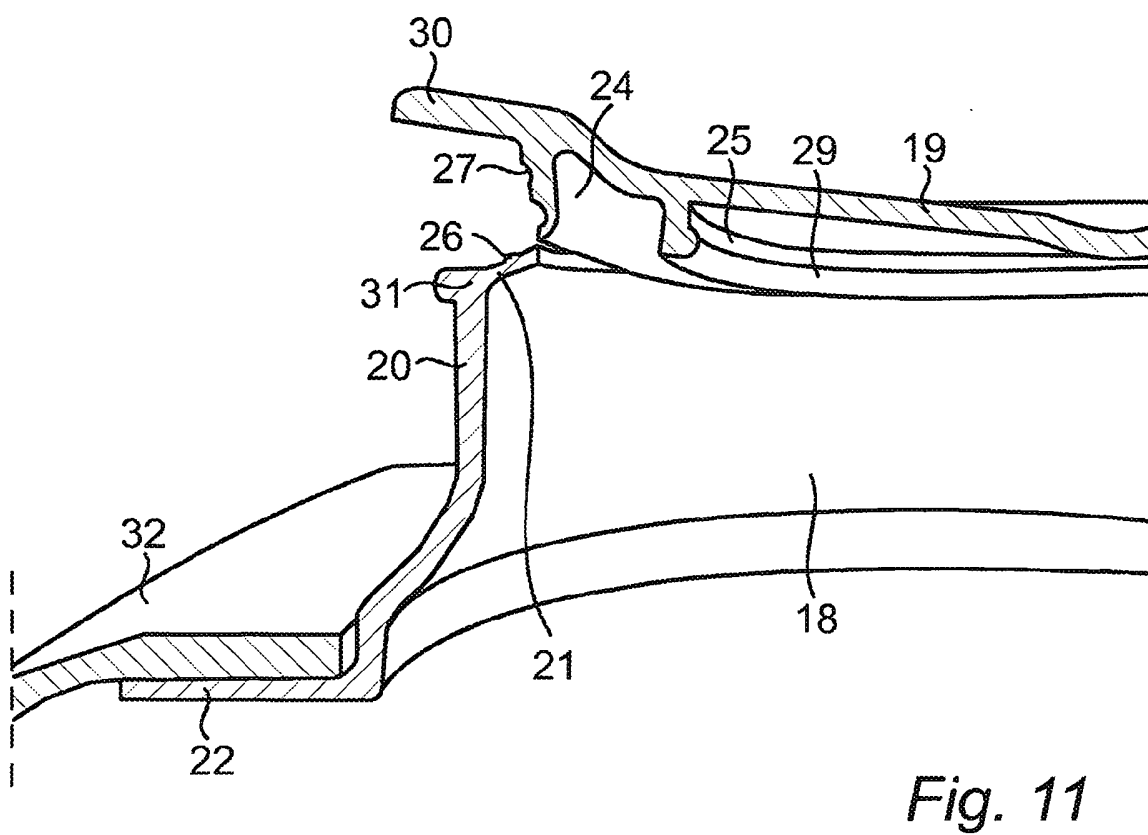
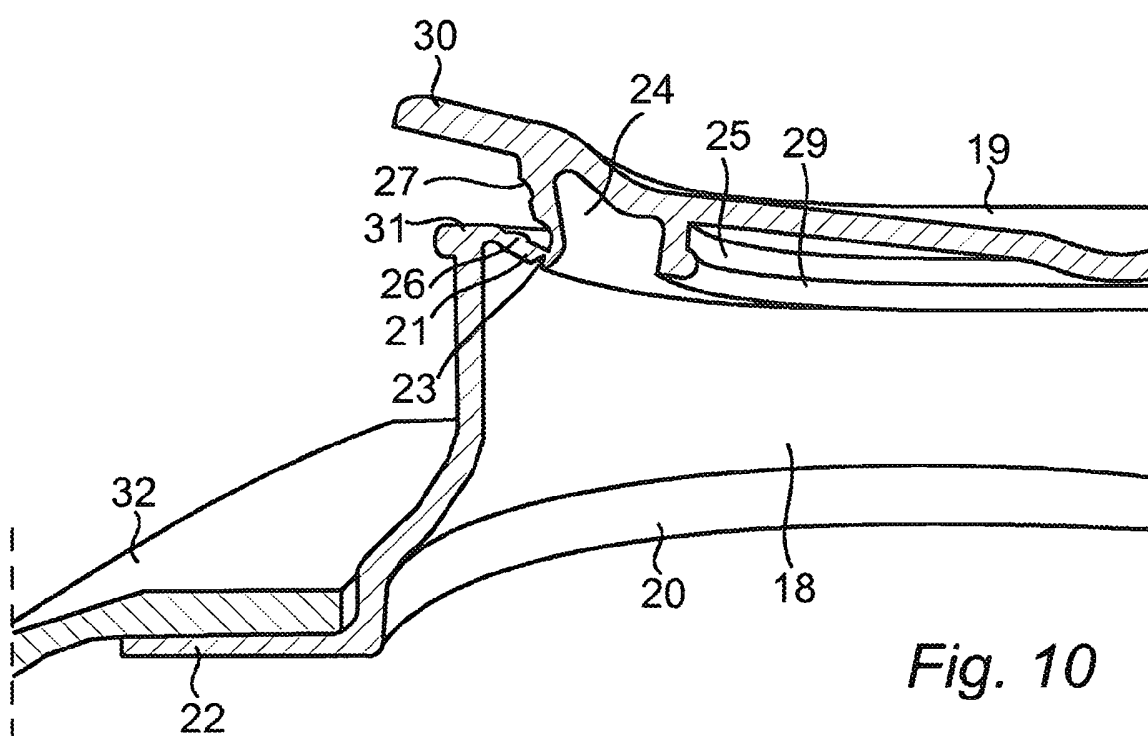
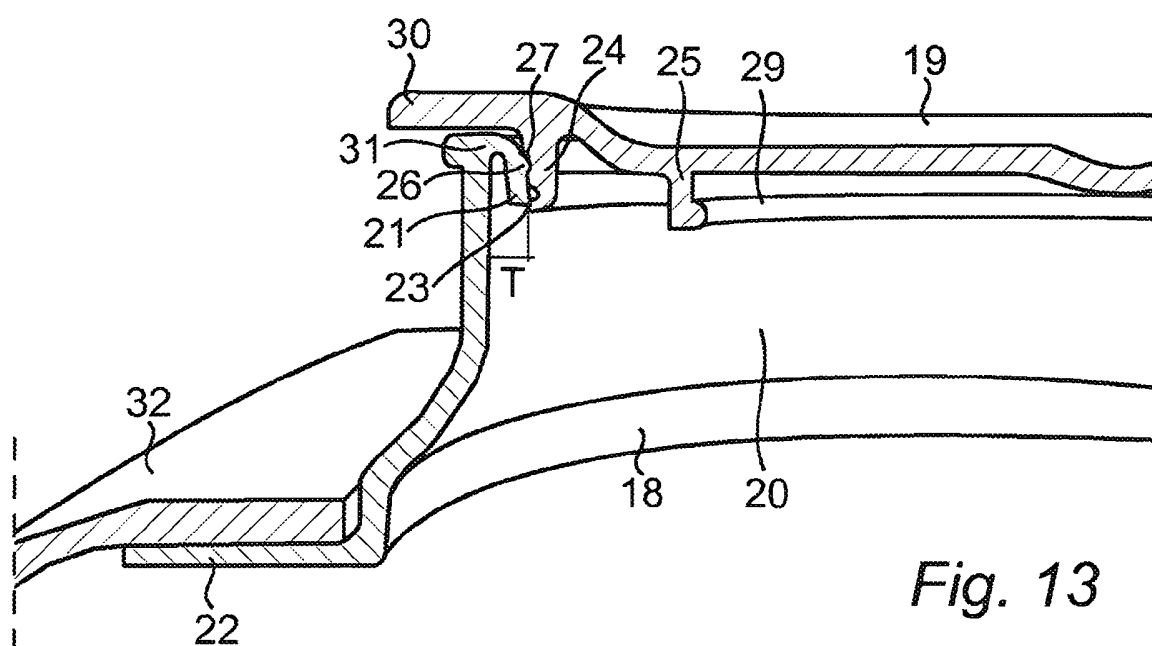
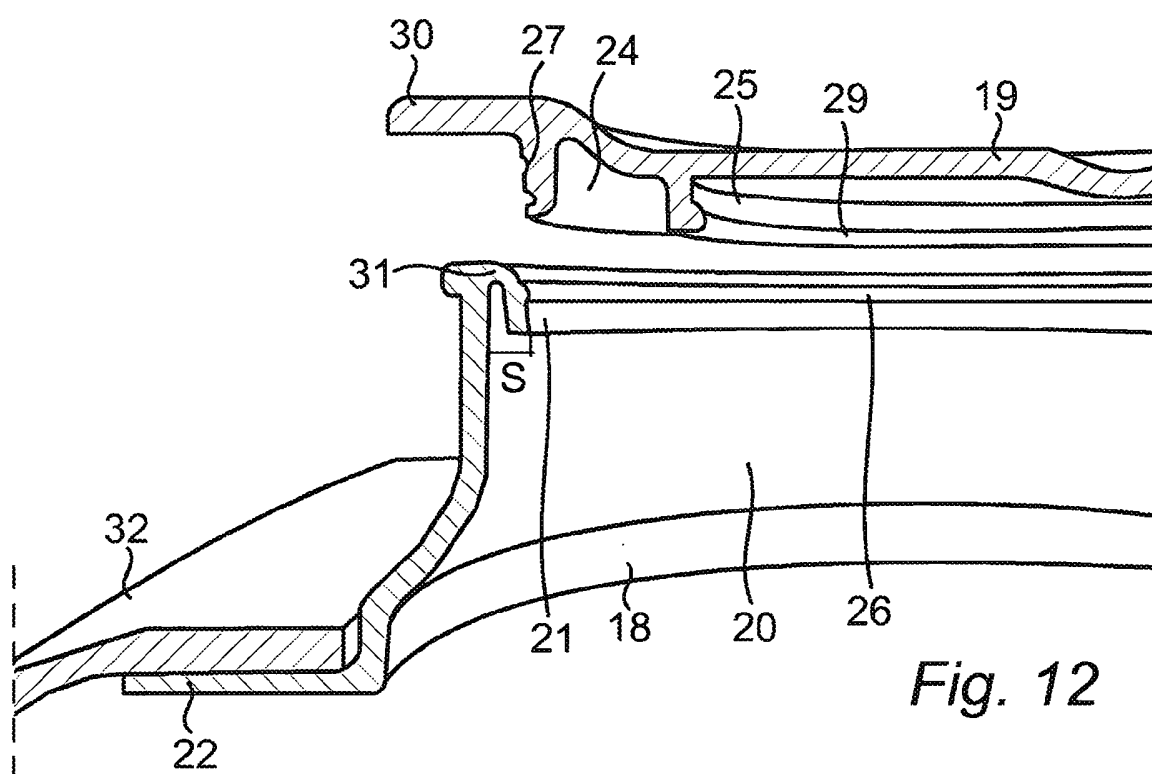


Fig. 9





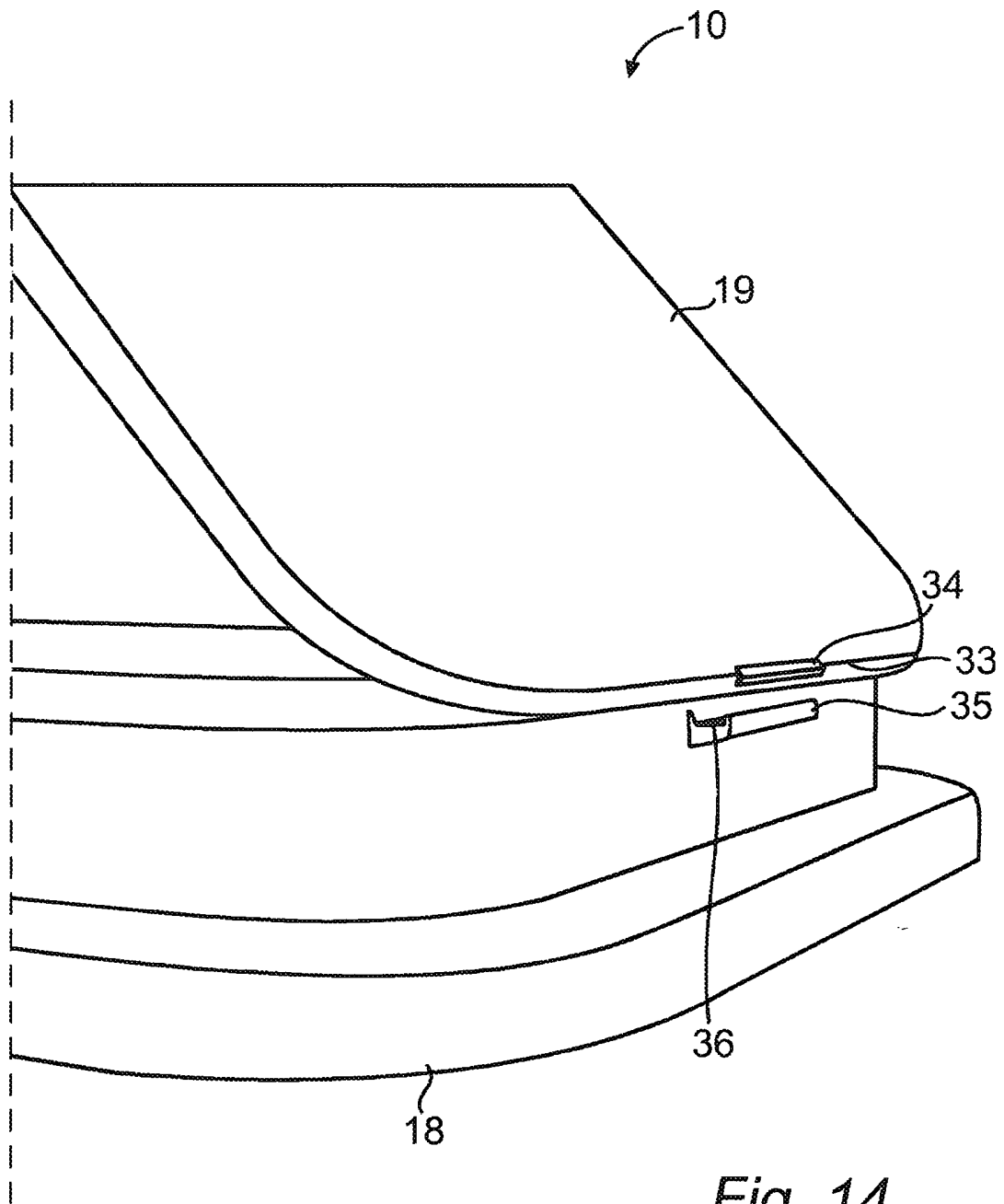


Fig. 14

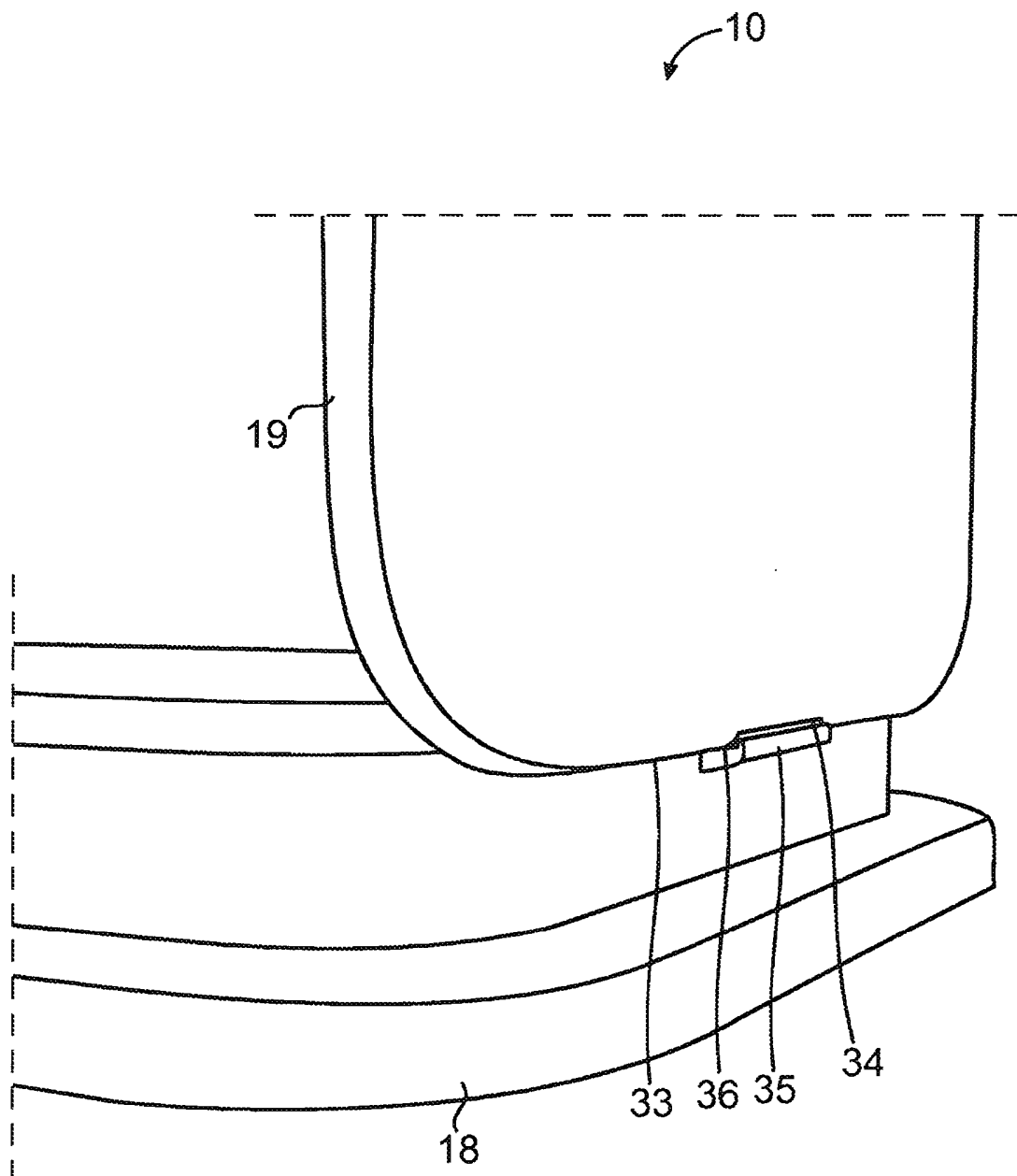


Fig. 15

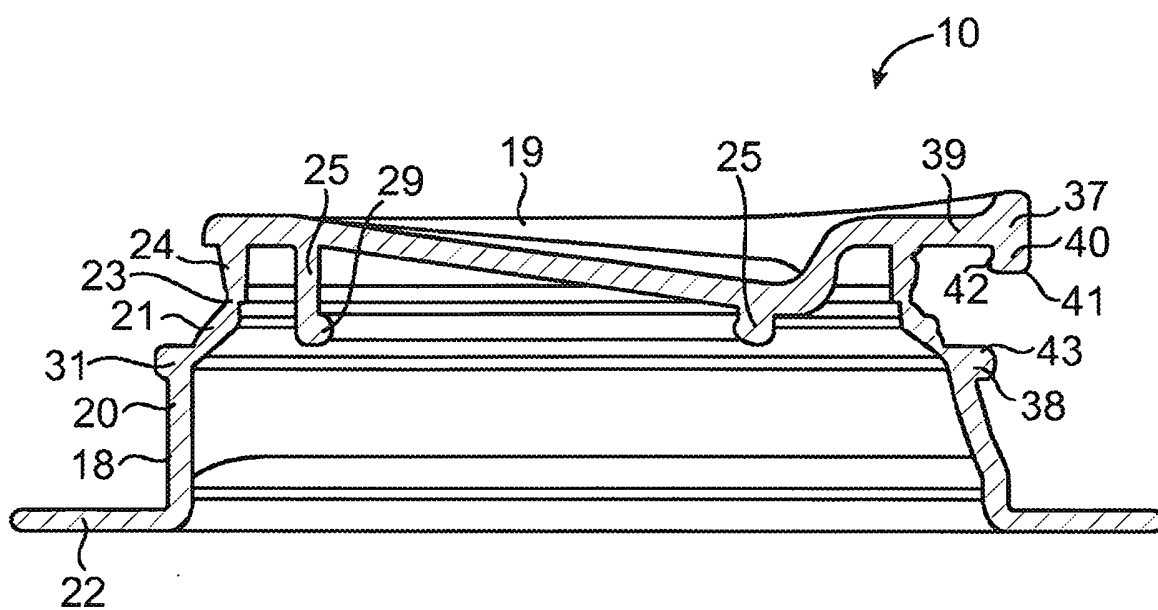


Fig. 16

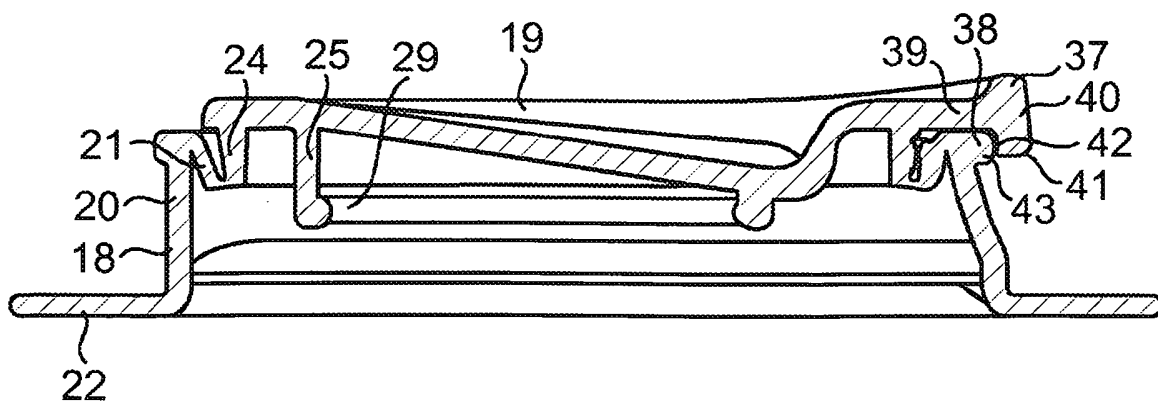


Fig. 17

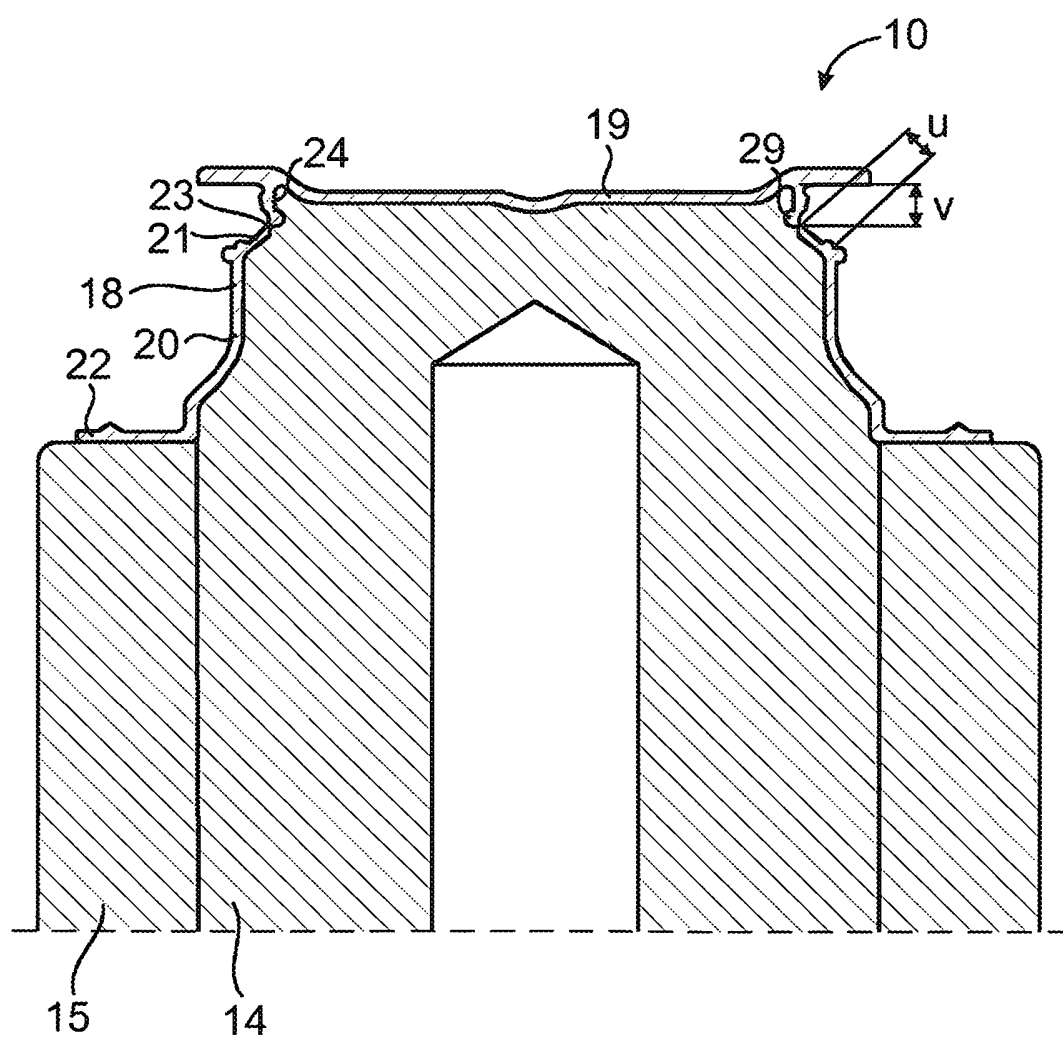
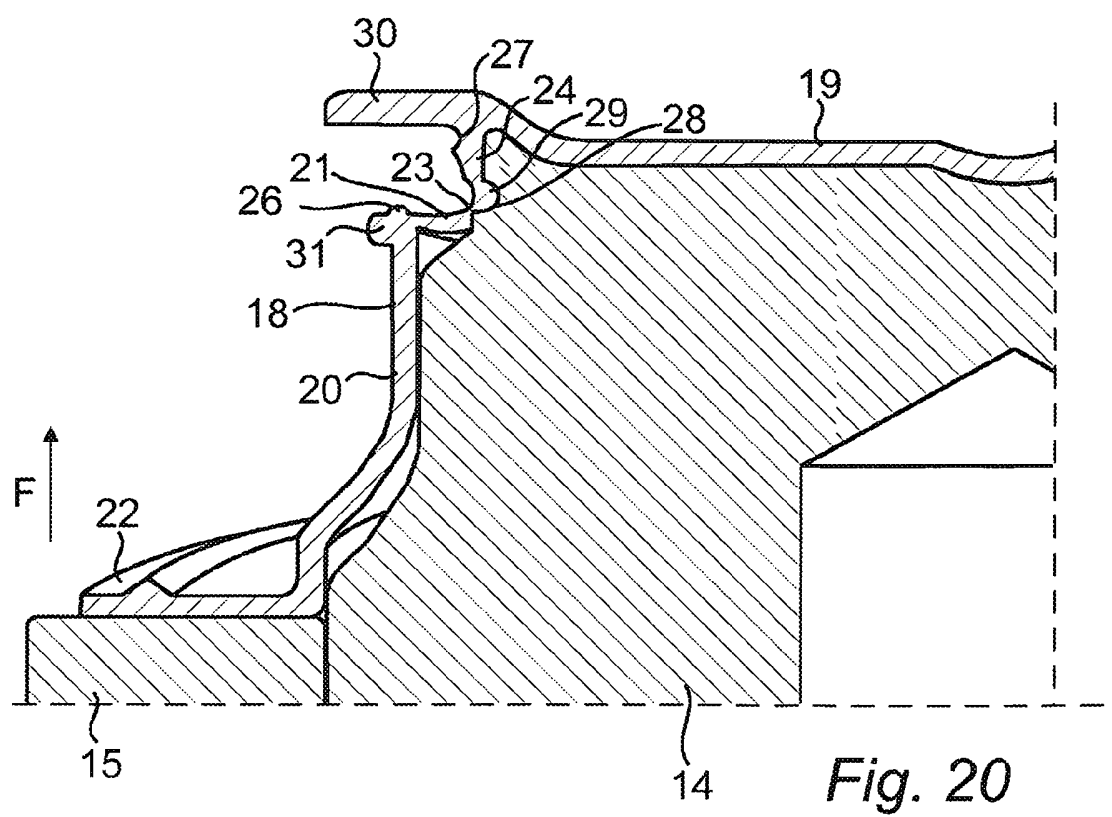
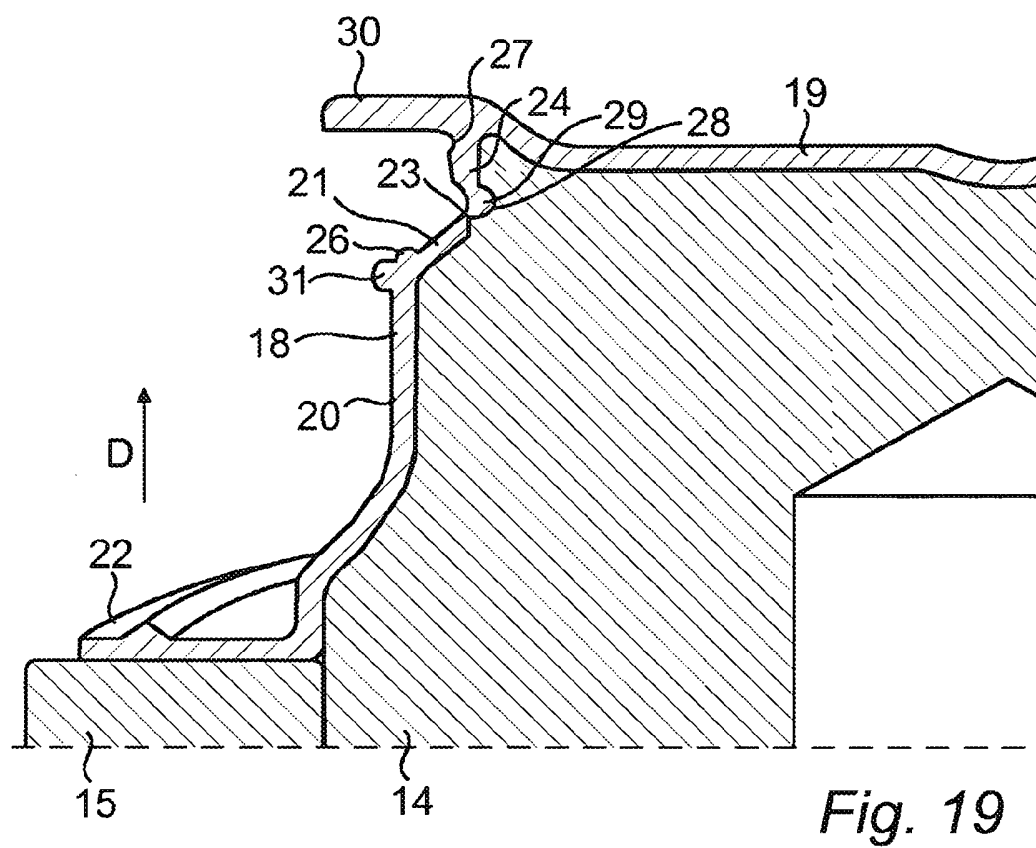
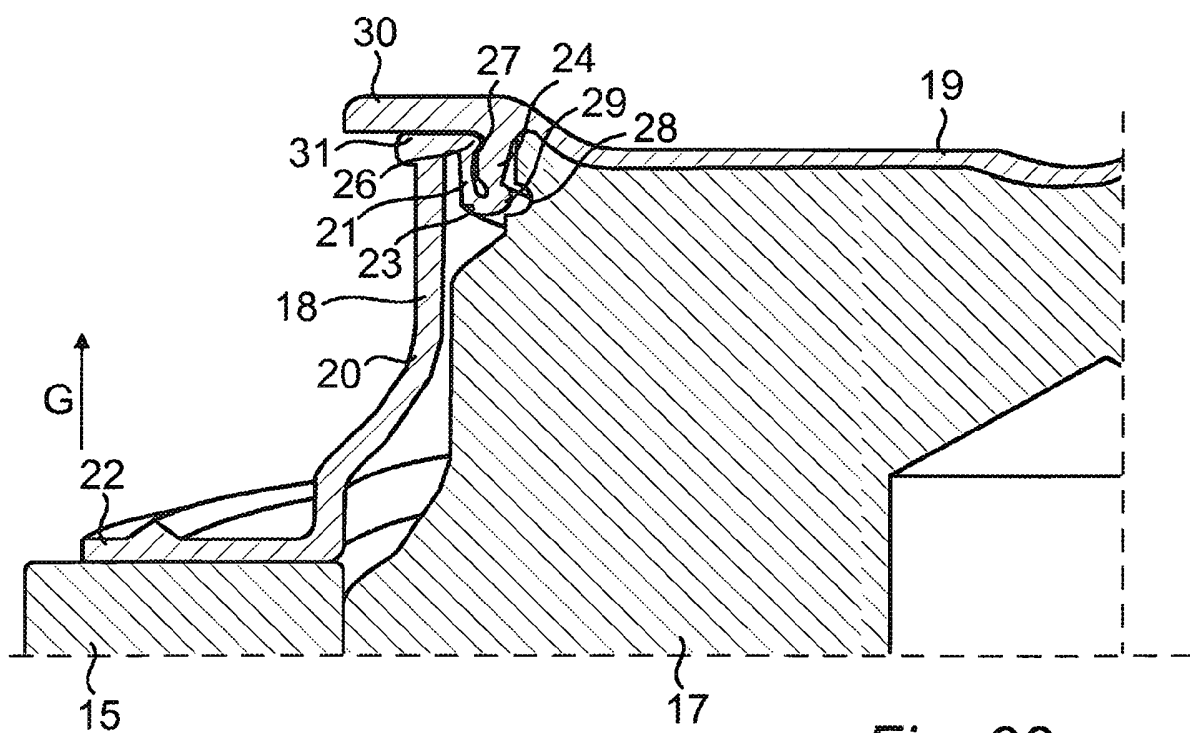
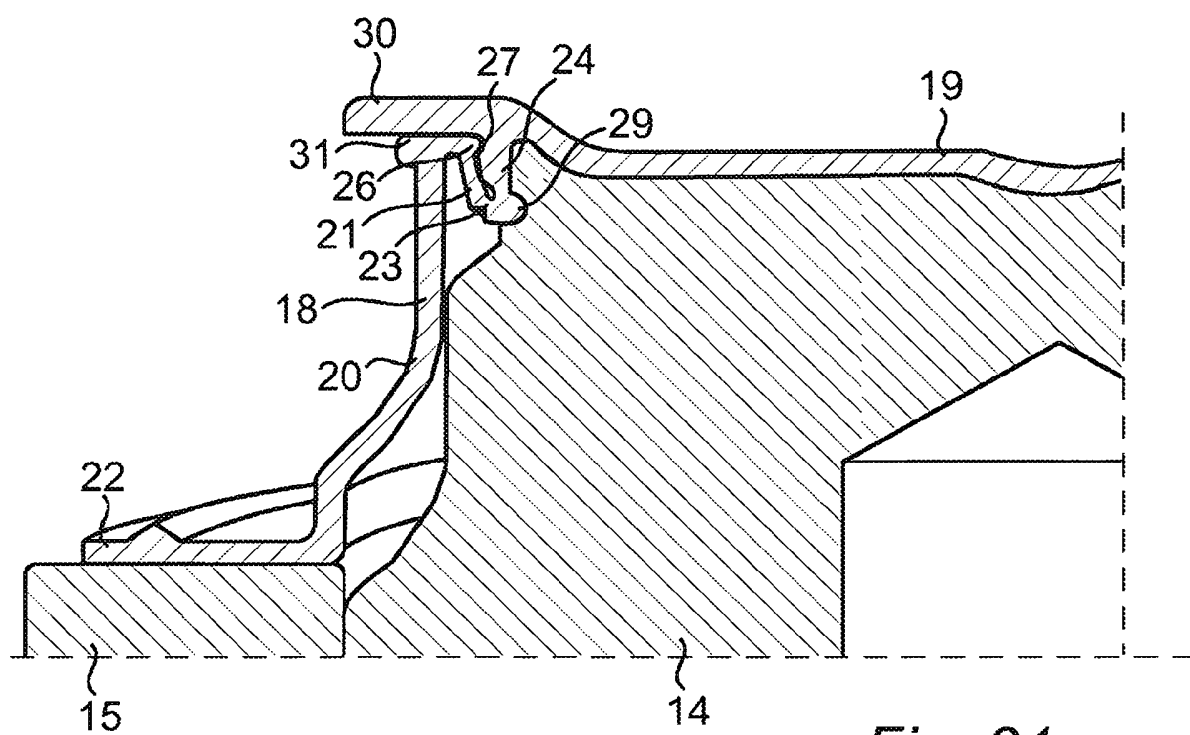


Fig. 18





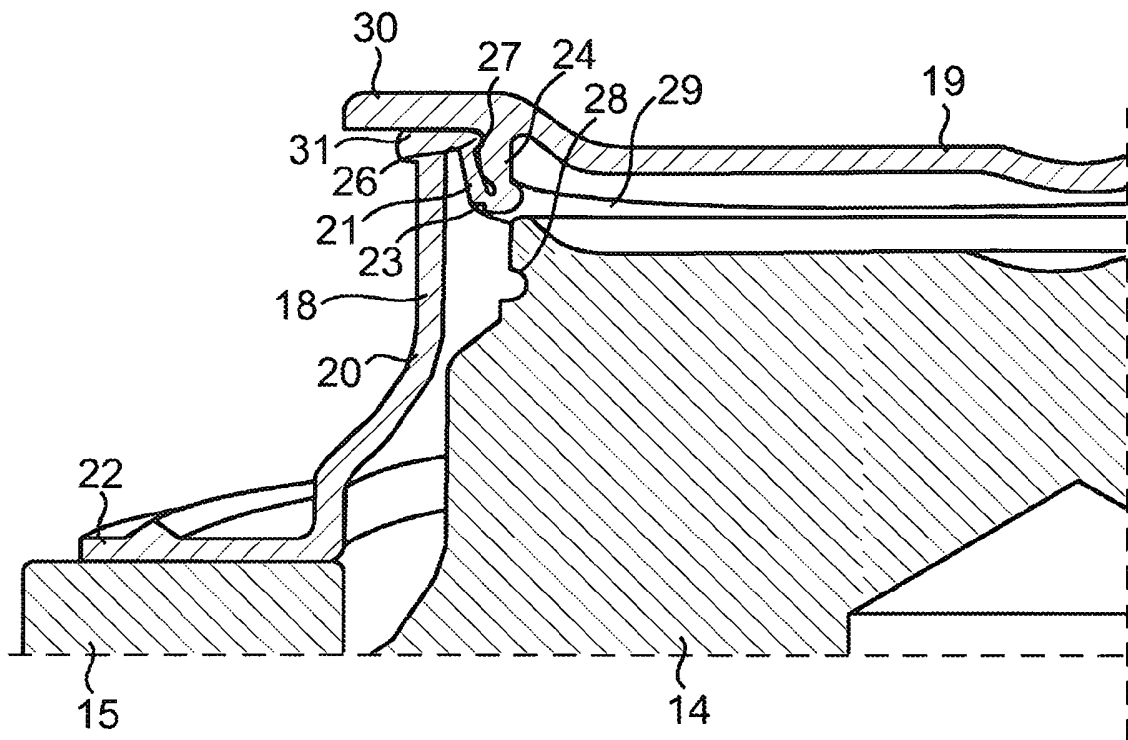


Fig. 23

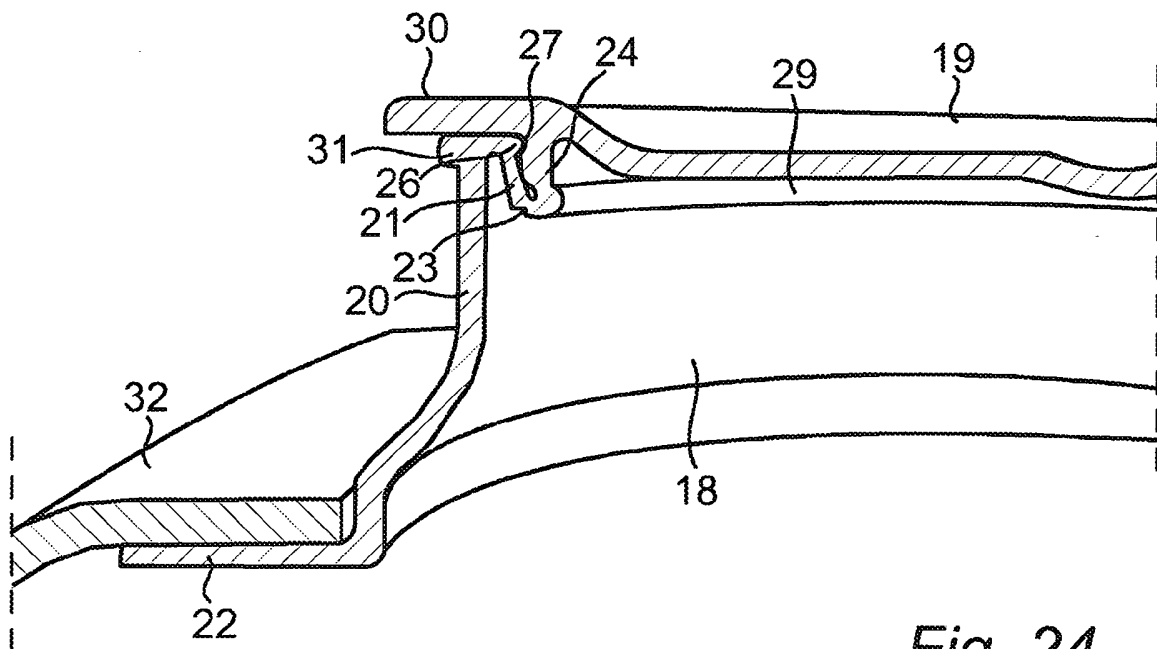


Fig. 24

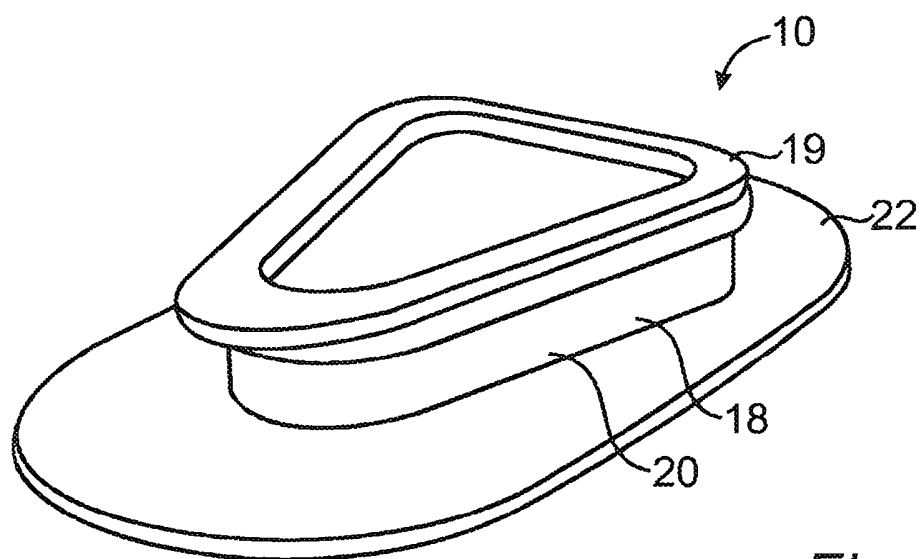


Fig. 25

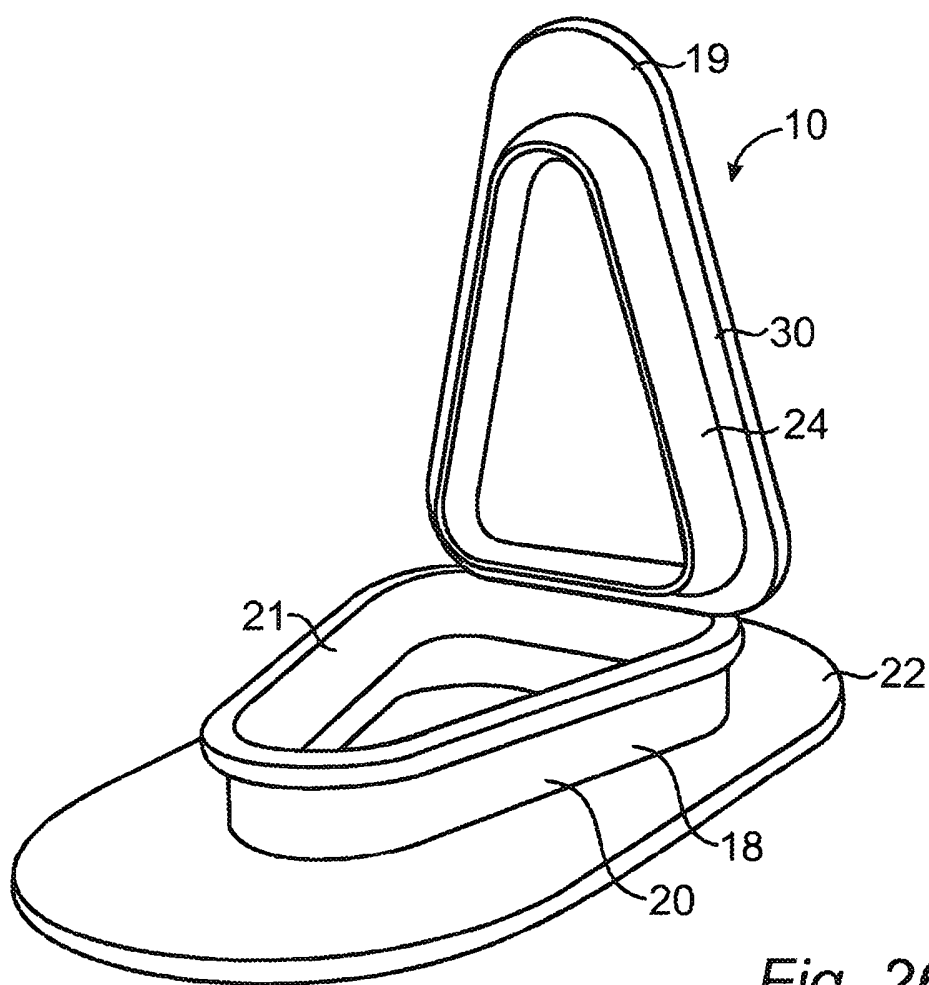


Fig. 26

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- US 6192569 B [0005]

CSOMAGZÁRÓ ESZKÖZ, VALAMINT A CSOMAGZÁRÓ ESZKÖZ ELŐÁLLÍTÁSÁRA SZOLGÁLÓ BERENDEZÉS ÉS ELJÁRÁS

SZABADALMI IGÉNYPONTOK

1. Csomagzáró eszköz (10), amely magában foglal egy középponti tengelyt (X), egy nyílással ellátott nyakat (18) és egy fedelet (19) a nyílás lezárására, amely nyak (18) magában foglal egy összekapcsoló részt (20) egy csomaghoz (32) való kapcsolódásra és egy, az összekapcsoló részből (20) befelé sugárirányban kiemelkedő zárórészt (21), amely kölcsönhatásban van a fedéllel (19) közöttük zárás létrehozása céljából, amely fedél (19) – kinyitása előtt – a zárórészhez (21) egy hornyon (23) keresztül kapcsolódik, amely fedél (19) a zárórésznek (21) legalább egy részéről a horony (23) mentén történő szakítás révén eltávolítható, és amely fedél (19) el van látva egy, a fedél (19) belső oldalából kiemelkedő zárótaggal (24), amely kölcsönhatásban van a nyak (18) zárórészeivel (21) úgy, hogy a csomagzáró eszköz (10) visszazárható, azzal jellemezve,

hogy a zárórész (21) és a zárótag (24) összehajlik az összekapcsoló részen (20) belül, és a zárórész (21) lefelé terjed ki, valamint azzal,

hogy a zárórész (21) legalább a csomagzáró eszköz (10) visszazárása után legalább részben tengelyirányban terjed ki az összekapcsoló rész (20) és a zárótag (24) közötti, és a zárást a zárótaggal (24) rugalmas kölcsönhatás révén képezi.

2. Az 1. igénypont szerinti csomagzáró eszköz, amelyben a zárótag (24) a nyak (18) összekapcsoló részének (20) belső oldalától sugárirányban bizonyos távolságban (T) helyezkedik el, a zárórész (21) szabad végének belső oldala a csomagzáró eszköz (10) kinyitása után a nyak (18) összekapcsoló részének (20) belső oldalától sugárirányban bizonyos távolságban (S) helyezkedik el, és a zárórész (21) szabad végének belső oldala és a nyak (18) összekapcsoló része (20) közötti távolság (S) nagyobb, mint a zárótag (24) és a nyak (18) összekapcsoló része (20) közötti távolság (T), amikor a zárórészre (21) nem hat a zárótag (24).

3. Az 1. vagy a 2. igénypont szerinti csomagzáró eszköz, amelyben a fedél (19) belső oldala el van látva egy sugárirányban befelé kiemelkedő peremmel (29) a csomagzáró eszköz (10) előállítására szolgáló berendezésben lévő szerszámmaggal (14) való kölcsönhatás céljából úgy, hogy a fedél (19) az előállítása során kapcsolódik a szerszámmaghoz (14).

4. A 3. igénypont szerinti csomagzáró eszköz, amelyben a zárótag (24) peremmel (29) van ellátva.

5. A 3. igénypont szerinti csomagzáró eszköz, amelyben a fedél (19) belső oldala el van látva egy, a peremmel (25) rendelkező, hajlékony kiemelkedéssel (25), amely hajlékony kiemelkedés (29) a zárótagon (24) belül sugárirányban helyezkedik el, és tengelyirányban terjed ki.

6. A 3-5. igénypontok bármelyike szerinti csomagzáró eszköz, amelyben a zárórész (21) az összekapcsoló részhez (20) viszonyítva úgy hajlékony, hogy az összekapcsoló rész (20) a fedélhez (19) képest tengelyirányban elmozdítható a zárórész (21) behajlása és a horony (23) mentén történő összehajlása közben, amikor a fedél (19) a perem (29) révén a szerszámmaghoz (14) kapcsolódik.

7. Az előző igénypontok bármelyike szerinti csomagzáró eszköz, amelyben a zárórész (21) hossza (u) nagyobb, mint zárótag (24) hossza (v).

8. Az előző igénypontok bármelyike szerinti csomagzáró eszköz, amelyben a zárórész (21) és a zárótag (24) bepattanózár funkció révén vannak kölcsönhatásban.

9. Az előző igénypontok bármelyike szerinti csomagzáró eszköz, amelyben a fedél (19) egy csuklópántos részen (33) keresztül kapcsolódik a nyakhoz (18) úgy, hogy a fedél (19) el tud fordulni a csuklópántos rész (33) körül, és amelyben a fedélnek (19) és a nyaknak (18) egy része bepattanózár funkció révén van kölcsönhatásban úgy, hogy a fedél (19) nyitott helyzetében hozzákapcsolható a nyakhoz (18).

10. Az előző igénypontok bármelyike szerinti csomagzáró eszköz, amelyben a horony (23) a csomagzáró eszköz (10) kinyitása előtt a zárótaggal (24) és a zárórészszel (21) érintkezve helyezkedik el.

11. Berendezés az 1-10. igénypont szerinti csomagzáró eszköz (10) előállítására, amely eszköznek van egy középponti tengelye (X), egy nyaka (18) és egy sugárirányban kiterjedő fedele (19) a nyak (18) sugárirányban kiterjedő nyílásának a lezárására, amely berendezés magában foglal egy mozgatható első befogópofát (11), egy mozgatható második befogópofát (12) és egy szerszámmagot (14) a befogópofákkal (11, 12) való kölcsönhatás céljából, hogy öntőformát képezzenek a csomagzáró eszköz (10) számára, valamint egy kilökött (15) az előállított csomagzáró eszköz (10) kilökésére, azzal jellemezve, hogy

a szerszámmag (14) és a befogópofák (11, 12) úgy vannak elhelyezve, hogy egy összekapcsoló részt (20) és a nyak (18) zárórészét (21), valamint a zárórész (21) és a fedél (19) zárótagja (24) között egy elszakítható hornyot (23) alakítsanak ki, amely fedél (19) a

zárórésznek (21) legalább egy részéről a horony (23) mentén történő szakítás révén eltávolítható, és

hogy a szerszámmag (14) magában foglal egy sugárirányban kiterjedő mélyedést (28) a fedél (19) peremének (29) kialakítása és az azzal való kölcsönhatás céljából úgy, hogy a nyak (18) összekapcsoló része (20) a kilökö (15) segítségével a fedélhez (19) képest elmozdítható a zárórész (21) behajlása és a horony (23) mentén történő összehajlása közben, amíg a zárórész (21) és a zárótag (24) össze nem hajlik az összekapcsoló részen (20) belül, amikor a fedél (19) a peremen (29) keresztül a szerszámmaghoz (14) kapcsolódik, amely csomagzáró eszköz a horony (23) elszakítása után a zárórész (21) és a zárótag (24) közötti kölcsönhatás révén visszazárható.

12. A 11. igénypont szerinti berendezés, amelyben a befogópofák (11, 12) és a szerszámmag (14) úgy vannak elhelyezve, hogy a nyakat (18) és a fedelet (19) egy darabból álló egységként alakítsák ki.

13. A 11. vagy a 12. igénypont szerinti berendezés, amelyben a szerszámmag (14) a kilökön (15) belül sugárirányban helyezkedik el.

14. Eljárás az 1-10. igénypont szerinti csomagzáró eszköz (10) előállítására, amely eszköznek van egy középponti tengelye (X), egy nyaka (18) és egy sugárirányban kiterjedő fedele (19) a nyak (18) sugárirányban kiterjedő nyílásának a lezárására, és az eljárást a következő lépések jellemzik:

a befogópofák (11, 12) és egy szerszámmag (14) segítségével kialakítunk egy összekapcsoló részt (20) és a nyak (18) zárórészét (21), valamint a zárórész (21) és a fedél (19) zárótagja (24) között egy elszakítható hornyot (23), amely fedél (19) a zárórésznek (21) legalább egy részéről a horony (23) mentén történő szakítás révén eltávolítható,

a szerszámmag (14) egy sugárirányban kiterjedő mélyedésének (28) a segítségével kialakítunk egy peremet (29) a fedél (19) belső oldalán, amely perem (29) a szerszámmaggal (14) való kölcsönhatásra szolgál,

eltávolítjuk a befogópofákat (11, 12) az öntött csomagzáró eszköztől (10),

a szerszámmag (14) segítségével visszatartjuk a fedelet (19) a fedél (19) belső oldalán elhelyezkedő peremnél (29) fogva, és ezzel egyidejűleg

egy kilökö (15) segítségével elmozdítjuk a nyak (18) összekapcsoló részét (20) a fedélhez (19) képest a zárórész (21) behajlítása és a horony (23) mentén történő összehajtása közben, amíg a zárórész (21) és a zárótag (24) össze nem hajlik az összekapcsoló részen (20) belül, amely csomagzáró eszköz a horony (23) elszakítása után a zárórész (21) és a zárótag

(24) közötti kölcsönhatás révén visszazárható, és

a kilőkő (19) segítségével elmozdítjuk a csomagzáró eszközt (10) a szerszámmaghoz (14) képest úgy, hogy a perem (29) és a szerszámmag (14) szétkapcsolódik.

15. A 14. igénypont szerinti eljárás, amely magában foglalja azt a lépést, hogy a nyakat (18) és a fedelet (19) egy darabból álló egységként állítjuk elő.

16. A 14. vagy a 15. igénypont szerinti eljárás, amely magában foglalja azt a lépést, hogy elmozdítjuk a nyak (18) összekapcsoló részét (20) a fedélhez (19) képest a zárórész (21) behajlításával és a horony (23) mentén történő összehajtásával úgy, hogy a zárórész (21) befelé hajlik össze, és a nyak (18) összekapcsoló része (20) és a csomagzáró eszköz (10) középponti tengelye (X) között helyezkedik el.

(A meghatalmazott)

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